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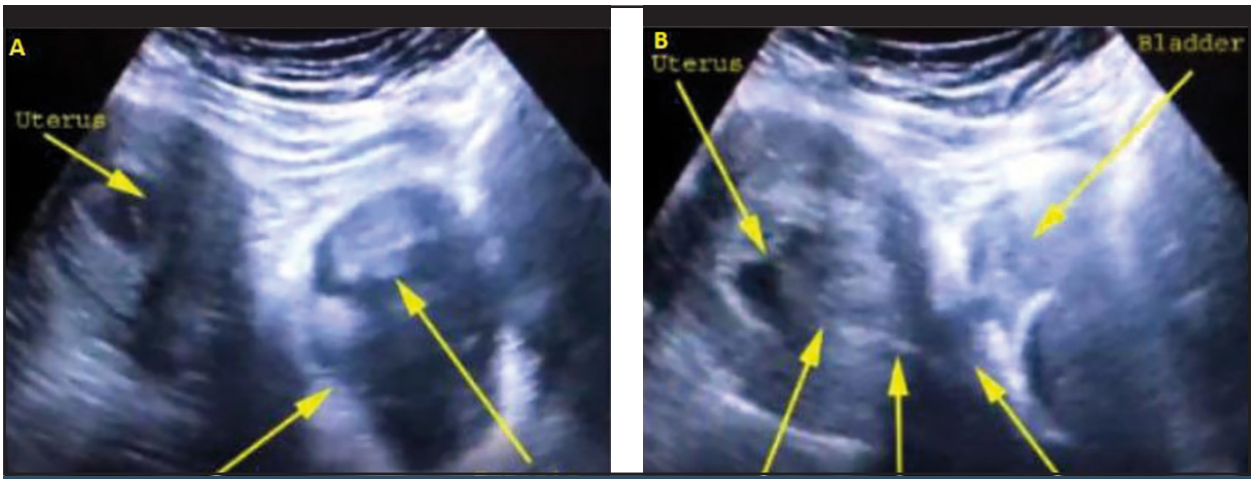

Tunçekin A, İncebıyık A, Demir M, Yağmur İ, et al. A rare cause of hematuria, intravesical ectopic pregnancy; case report.
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Contact
Istanbul St. Yenimahalle Mah. Kosk Apt.
N:113/A Bakırkoy / Istanbul
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Dear Colleagues,

We are pleased to have published the third issue of The New Journal of Urology for 2022. This issue includes 8 original articles and 1 case reports. Published articles consist of general urology, urooncology and endourology. We believe that all the current articles will be read with interest and these articles are expected to contribute to the literature and serve as a reference for future studies.

The New Urology Journal has been indexed in the TUBİTAK-ULAKBİM TR Index since the first issue of 2011. The indexing process of our journal in ESCI, Pubmed and EMBASE continues. Our goal is to increase the visibility of our journal both nationally and internationally with articles of high scientific quality and to become one of the most read urology journals. We would like to inform you that only articles in English will be considered for publication.

The editorial team is very grateful to all the authors and reviewers who have contributed to this issue. We are aware that this is a painstaking effort, and we cannot thank you enough for it.

We request that you submit your articles to The New Journal of Urology, take timely and rigorous action as a referee, and read the articles published in the journal and cite them where appropriate.

Respectfully yours.

Ali İhsan TAŞÇI
Editor-in-Chief

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CONTENTS

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Yeni Üroloji Dergisi - *The New Journal of Urology* **2022; 17(3):123-135. DOI: 10.33719/yud.2022;17-3-1066203**

Original Research / Özgün Araştırma

A survey on the knowledge, opinions, and approaches in clinical practice of urology physicians about hyperbaric oxygen therapy application in Fournier gangrene

Üroloji hekimlerinin Fournier gangreninde hiperbarik oksijen tedavisi uygulamasına dair bilgi düzeyleri, görüşleri ve pratik uygulamadaki yaklaşımları

Kübra Özgök Kangal, Kübra Canarslan Demir

1. University of Health Science, Department of Undersea and Hyperbaric Medicine, Gülhane Training and Research Hospital, Ankara, Turkey

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Yazışma / Correspondence
Kübra Özgök Kangal
General Dr. Tevfik Sağlam Cd No:1,
06010, Etlik, Ankara / Türkiye
E-mail: kubra_ozgk@hotmail.com
Tel: +90 543 781 14 24

ORCID
K.Ö.K. 0000-0002-2449-4821
K.C.D. 0000-0001-7705-3926

Özet

Amaç: Fournier gangreni, yüksek mortaliteye sahip bir nekrotizan fasiit formudur. Hiperbarik oksijen tedavisi (HBOT) başarılı bir destek tedavi seçeneği olarak gösterilmektedir. Bu çalışmada, üroloji doktorlarının Fournier gangreninde HBOT uygulaması hakkındaki bilgi düzeyleri, görüşleri ve pratik uygulamadaki tercihlerini bir anket ile sorgulamayı amaçladık.

Gereç ve Yöntemler: Üroloji alanında uzman olan veya en az 1 yıldır uzmanlık eğitimine devam eden doktorlarımıza online veya yüz yüze olarak anket uygulanmıştır.

Bulgular: Anketi dolduran 90 üroloji hekiminin %69,7'si Ankara'da çalışan hekimlerdi. Hekimlerin %42,2'si yılda 1-5 Fournier gangreni vakasını tedaviye etmekteydi; ancak çoğunlukla (%56,4) hastaları HBOT için hiçbir zaman yönlendirmedikleri görüldü. Çoğunluk (%55,3) HBOT'ni ancak cerrahi debridman ve antibiyoterapiye yanıtsız durumlarda tercih ettiğini belirtti. Hekimlerin HBOT hakkındaki bilgi düzeylerini kendilerinin değerlendirmeleri istendi; %27,3'ü hiçbir bilgisi olmadığını bildirdi. Daha önce bir HBOT merkezinde bulunmuş olan 12 hekim (%13,3), HBOT ile ilgili bir bilimsel çalışmada yer aldığını bildiren 15 hekim (%16,7) vardı. Fournier gangreni hastalarında HBOT'nin faydası olmadığını düşünen sadece 3 hekim (%3,4) vardı. Fournier gangreninde HBOT etkinliği hakkındaki gö-

Abstract

Objective: Fournier gangrene is a form of necrotizing fasciitis with high mortality. Hyperbaric oxygen therapy (HBOT) is a successful and supportive treatment option for Fournier's gangrene (FG). This study aimed to analyze urologists' knowledge, opinions, and preferences about HBOT application in FG.

Material and Methods: An online or face-to-face questionnaire was applied to physicians who are experts in the field of Urology or who have been continuing Urology residency training for at least one year.

Results: Ninety urology physicians filled out the questionnaire. Most of them (56.4%) never refer FG cases to HBOT. Physicians (55.3%) mostly preferred HBOT only in patients unresponsive to surgical debridement and antibiotherapy. Besides, 27.3% of them stated they had no information when asked to self-assess their knowledge. Only 12 physicians (13.3%) had previously been in an HBOT center, and 15 (16.7%) physicians had participated in a scientific study on HBOT. Only three physicians (3.4%) stated HBOT was not beneficial to FG patients. Urologists' opinions about HBOT efficiency in FG were examined (3-point-Likert type questions) in 5 questions; the median score was 2 points (minimum-maximum: 1-3 points). On the other hand, physicians who did not know HBOT had more negative opinions about HBOT efficiency in FG (p = 0.002).

The study was approved by Health Sciences University Gulhane Research and Training Hospital Non-Invasive Investigation Ethics Committee (Approval No: 2021-424, Date: 2021/12/16). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

rüşler 3'lü likert tipi şeklinde 5 soru halinde sorulmuştur; ortanca puan 2 (minimum-maksimum: 1-3) olarak hesaplanmıştır. HBOT hakkında hiçbir bilgisi olmayan hekimlerin, Fournier gangreninde HBOT uygulaması hakkındaki daha olumsuz görüşlere sahip olduğu görüldü (p=0,002).

Sonuç: Üroloji hekimlerimizin Fournier gangreninde HBOT hakkındaki bilgilerinin az olması, pratik uygulamadaki çekinceleri ve farkındalıklarının az olması çalışmamızda net olarak görülmüştür. Hekimlerimizin HBOT deneyimlerini arttırmaları, bilimsel çalışmalar planlamaları ve üroloji dernekleri tarafından bu konunun tartışmaya açılması gerektiğini düşünüyoruz.

Anahtar Kelimeler: Fournier gangreni, hiperbarik oksijenasyon, anket, ürolog

Conclusion: Urology physicians' knowledge of HBOT, their doubts about HBOT in FG, and their relatively low experience with HBOT are clearly shown in this study. Therefore, urology physicians should be encouraged to increase their HBOT experience in FG and participate in scientific studies. Also, Urology Associations should discuss HBOT efficiency more effectively in guidelines and meetings.

Keywords: Fournier's gangrene, hyperbaric oxygenation, questionnaire, urologists

INTRODUCTION

Fournier's Gangrene (FG) is necrotizing fasciitis that affects the deep and superficial layers of the perineum and genital area (1). The incidence of FG in men aged 50-79 in the United States (US) is 1.6/per 100,000. In most case series, the mortality rate of FG is reported to be between 20% and 40%, but it ranges from 4% to 88% (2). Due to the rapid progression and high mortality of FG, early diagnosis and intervention are vital. Medical resuscitation and urgent surgical debridement are required (1).

Hyperbaric oxygen therapy (HBOT) is a supportive treatment option that can be applied under emergency conditions after surgery and medical intervention in FG (1). The mortality rates in FG patients who underwent HBOT are reported to be between 0% and 26.9% (3-9). It has been stated that HBOT reduces systemic toxicity, prevents the progression of necrosis, and accelerates the development of the demarcation line (4). It is an emergency HBOT indication accepted by our country's Health Practice Communique (HPC) (10). However, it is not included among the common treatment recommendations in the 2021 Guidelines of the European Association of Urology (EAU) due to insufficient evidence about HBOT in FG treatment (11). Notably, only 35 FG cases were consulted for 25 years in a retrospective series conducted by an HBOT center (12). Based on our own experience, we think that very few FG patients are consulted for HBOT.

Applying all beneficial treatment options to this highly fatal disease is vital. In this study, we aimed to question the level of knowledge, opinions, and practical preferences of Urology physicians in our country about applying HBOT in FG, a real urological emergency. Secondly, we aimed to raise awareness among Urology physicians about HBOT application in FG.

MATERIAL AND METHODS

In this study, a face-to-face or online questionnaire was applied to Urology physicians who were members of the International Association of Laparoscopic Robotic Surgery (ILRSA) and the Turkish Urology Association Central Anatolia Branch between 17th December 2021 and 15th January 2022. The questionnaire consists of four sections: information about professional experience, clinical experience in FG, knowledge level about HBOT, and opinions about HBOT in FG. The first section has four open-ended questions, and the rest of the questionnaire consists of closed-ended questions. The survey questions are available in Table 1. In addition, Likert-type scoring is used to analyze clinicians' opinions and knowledge of the HBOT application in FG. For further statistical analyses, knowledge level is classified into two groups "no knowledge of HBOT" and "know about HBOT." The second group consists of "little knowledge," "intermediate level of knowledge," and "adequate knowledge for Urology physicians."

Among the criteria for inclusion in the study are; (i) having expertise in Urology or actively receiving a Urology residency training program, (ii) having completed at least one year of Urology residency training program (iii) actively continuing as a physician in the field of

Urology. Among the exclusion criteria from the study are; (i) physicians who are receiving a Urology residency training program and have not completed one year.

The study was approved by the Health Sciences University Non-Invasive Investigation Ethical Committee (Approval: 2021-424, Date: 2021/12/16). In addition, permission was obtained from the ILRSA and the Turkish Urology Association. An explanation was written at the beginning of the questionnaire. The completion of the questionnaire was accepted as consent.

Data analysis was performed using SPSS Statistics version 21 (IBM Corp., Armonk NY, USA). Data were expressed as n (%) or median (minimum-maximum). Those who did not answer the questions were excluded from the calculations and statistical analysis of the related questions. The Kolmogorov-Smirnov test examines the normal distribution of continuous data. The Chi-square test was used to compare the groups. The Likert-type question scoring was expressed by the median value (minimum-maximum). The Wilcoxon test was applied to compare the knowledge level score before and after the questionnaire. The Mann-Whitney U test was used for inter-group comparisons of the opinions on HBOT. A P-value <0.05 was considered statistically significant.

RESULTS

A total of 90 urology physicians participated in our survey. All of them were male. Table 2 displays demographic and professional information about physicians. Most of the respondents (n = 62, 69.7%) were from Ankara, and eight more provinces participated in this study.

Table 1. The questions of the survey

1-Demographic Data (professional experience)
Sex
Birth year
Title
City
Institution type
How long have you been working in Urology? (years)
2-Clinical Experience in Fournier's Gangrene
Have you ever treated a Fournier's Gangrene case?
How many Fournier's Gangrene cases approximately do you diagnose in a year?
Which treatment modalities do you prefer to use in Fournier's Gangrene patient?
Who is responsible for the wound care of a Fournier's Gangrene case?
Do you refer Fournier's Gangrene cases to hyperbaric oxygen therapy?
When do you prefer to consult Fournier's Gangrene patient for hyperbaric oxygen therapy?
3- The Knowledge about Hyperbaric Oxygen Therapy
Do you have adequate knowledge about the HBOT application in Fournier's Gangrene?
What is the pressure of a hyperbaric oxygen therapy session in Fournier's Gangrene? (ATA: absolute atmosfere)
What is the hyperbaric oxygen therapy session duration in Fournier's Gangrene?
What is/are the oxygen delivery methods during hyperbaric oxygen therapy?
What is the frequency of the hyperbaric oxygen therapy sessions in Fournier's Gangrene?
How do you examine a Fournier's Gangrene patient's treatment response during hyperbaric oxygen therapy period?
The mechanisms of action of hyperbaric oxygen therapy are listed below. Please state your opinion about the effectiveness of each mechanism in Fournier's gangrene. (Yes / I do not know / No)
a. hyperoxygenation
b. augmenting the effects of some antibiotics

c. stimulation of angiogenesis

d. anti-inflammation

e. anti-infective

f. enhancing collagen formation and granulation tissue formation

g. anti-edema

h. reduction of the gas bubbles sizes

Is there a Hyperbaric Oxygen Therapy Center in your institution?

Have you ever referred a patient to hyperbaric oxygen therapy other than Fournier's Gangrene?

Please state the disease if you answered yes.

Do you have adequate knowledge about hyperbaric oxygen therapy in Fournier's gangrene?

Have you ever been participated in a scientific study about hyperbaric oxygen therapy?

Have you ever visited a hyperbaric oxygen therapy center?

Is there a hyperbaric oxygen therapy center in your province?

Please state your opinion about the incidents below, whether it is a complication of hyperbaric oxygen therapy. (Yes / I am not sure / No)

a. perforation of the tympanic membrane

b. cerebrovascular incident

c. seizure

d. pneumothorax

e. worsening of heart failure

f. renal failure

g. headache

h. failure of the pacemaker

Please state your opinions about the statements below.

a. There is only a few hyperbaric oxygen therapy center in our country.

b. Hyperbaric oxygen therapy is a treatment modality in which the person breathes 100% oxygen in a closed room under high pressure.

c. Claustrophobia is a relative contraindication for hyperbaric oxygen therapy.

d. Psychiatric diseases are relative contraindications for hyperbaric oxygen therapy.

e. Fire could develop if safety rules were not followed during hyperbaric oxygen therapy.

f. Patients with VAC (vacuum-assisted closure) could enter hyperbaric oxygen therapy sessions.

4- Opinions about Hyperbaric Oxygen Therapy

Do you believe hyperbaric oxygen therapy is effective in Fournier's gangrene?

Please state your opinion about the statements below. (Yes / I do not know / No)

a. Hyperbaric oxygen therapy is effective in Fournier's Gangrene.

b. Hyperbaric oxygen therapy is a cost-effective treatment in Fournier's Gangrene.

c. Hyperbaric oxygen therapy is a safe treatment modality in Fournier's Gangrene.

d. Hyperbaric oxygen therapy shortens the recovery period in Fournier's Gangrene.

e. Hyperbaric oxygen therapy is a supportive treatment option in Fournier's Gangrene.

f. Surgical debridement should be completed before hyperbaric oxygen therapy.

g. If the patient is intubated, hyperbaric oxygen therapy cannot be applied.

Table 2. The demographic data of participants

	Median (Minimum-Maximum) or n (%)
Age	30 (27-65)
Experience	5 (1–40)
Title	
Residency program student	46 (51.7%)
Specialist	11 (12.4%)
Assistant Professor	6 (6.7%)
Associate Professor	14 (15.7%)
Professor	12 (13.5%)
Institution	
University	26 (29.2%)
Research and Training Hospital	55 (61.8%)
State Hospital	2 (2.2%)
Private Hospital	5 (5.6%)
Private Personal Clinic	1 (1.1%)

1- Clinical Experience

Almost all physicians (n=89, 98.9%) had experience with FG. The majority reported the average number of FG cases examined in a year as "1-5 cases" (n=38, 42.2%). Physicians who examined "more than 5 FG cases in a year" were 37.8% (n=34). While surgical debridement (n=88, 97.7%), antibiotherapy (n=80, 88.8%), blood glucose control (n=70, 77.7%) and wound care (n=67, 74.4%) were the most preferred treatment options, wound care of a FG patient was mostly planned by Urologists (n=65, 72.2%) and by General Surgeons (n=10, 11.1%), and Plastic Surgeons (n=3, 3.3%), respectively.

The referral rates of FG patients' for HBOT are shown in Figure 1. Most (n=21, 55.3%) referred FG patients for HBOT when they were unresponsive to surgical debridement and antibiotherapy. Clinical findings (n=68, 75.6%), anamnesis (n=36, 40%), blood tests (n=30, 33.3%), intraoperative findings (n=23, 25.6%) and other (n=1, 1.1%) were used for follow-up during HBOT period, respectively.

2- The Knowledge of HBOT

At the beginning and the end of the questionnaire, the participants were asked to self-assess their knowledge of HBOT in FG patients on a 4-point Likert scale. In the beginning, 24 physicians (27.3%) stated they did not know about HBOT. The median score for this question was calculated as 2 (1-4). Subsequently, general descriptive essential information about HBOT was questioned. At the end of the section, physicians were asked again to self-assess their knowledge of HBOT. The median score was calculated as 2 (1-4). There was a statistically significant decrease in the scores of the self-assessment questions about HBOT knowledge repeated before and after the survey ($p<0.001$). A detailed comparison is shown in Figure 2.

The participants were asked about the characteristics of an HBOT session applied in FG. The majority did not know about the pressure levels (87.5%), session duration (85.2%), and frequency of HBOT sessions (84.1%). Their knowledge of the oxygen delivery methods during HBOT is examined in Figure 3. The mechanisms of action (hyperoxygenation, augmenting the effects of some antibiotics, angiogenesis, anti-inflammatory effect, anti-infective effect, supporting collagen formation, anti-edema effect, reduction in the size of gas bubbles) were listed, and it was asked which of these mechanisms were beneficial in FG. Among these effects, the majority stated that they expect benefit from hyperoxygenation (n=66, 73.3%), enhancing the effects of some antibiotics (n=51, 56.7%), angiogene-

sis (n=57, 63.3%), anti-inflammatory effects (n=55, 61.1%), anti-infective effects (n =54, 60%) anti-edema effects (n=48, 53.3%) and collagen formation (n=47, 52.2%).

HBOT complications were asked of the participants. Fifty-four (62.8%) of the physicians were unsure about tympanic membrane perforation, 63 (74.1%) regarding seizures, 50 (58.8%) regarding worsening heart failure, and 69 (76.7%) regarding the failure of the pacemaker. Eighteen physicians (21.2%) and six physicians (7%) considered a cerebrovascular incident, which was not actually among the complications of HBOT, as a complication. Most physicians (n=36, 41.9%) knew that claustrophobia was a relative contraindication for HBOT. Similarly, most physicians (n=37, 42.5%) knew that fire could develop if safety rules were not followed during HBOT. Only 18 doctors (20.7%) stated that patients could enter the HBOT session with "vacuum-assisted closure-VAC."

Only eight physicians (9.1%) stated that there was an HBOT center in the hospital where they worked. However, 67 physicians (14.8%) stated that no HBOT center existed in their institution. While 68 physicians (77.3%) stated that there was an HBOT center in their city, 13 physicians (14.8%) stated that they did not know, and seven (7.9%) stated that there was no HBOT center in their city. Most physicians (n=44, 50.6%) thought HBOT centers were only in a few provinces in our country. Twenty-one physicians (23.3%) referred patients for HBOT other than FG. There were 12 physicians (13.3%) who had been to an HBOT center before. Fifteen physicians (16.7%) previously participated in a scientific study on HBOT, and 14 of these physicians took part in animal studies.

3- The Opinions about HBOT

There were 28 physicians (31.8%) believed that HBOT was beneficial in FG patients, 32 physicians (36.4%) believed it was partially beneficial, 25 physicians (28.4%) were indecisive on this issue, and three physicians (3.4%) did not believe it was beneficial. In addition, two physicians did not answer this question. The 3-point Likert-type scoring questions examined other opinions about HBOT. These questions' median score was 2.4 (1.8-3). The detailed examinations according to the questions are shown in Figure 4.

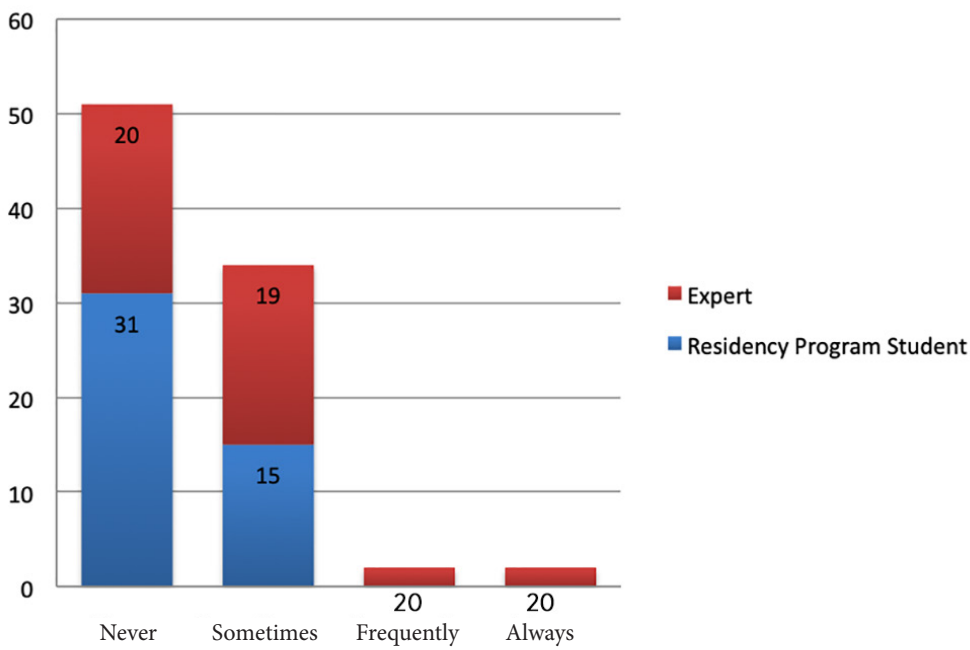

Figure 1. The rates of HBOT referrals of Fournier's Gangrene cases (Data were expressed as a number)

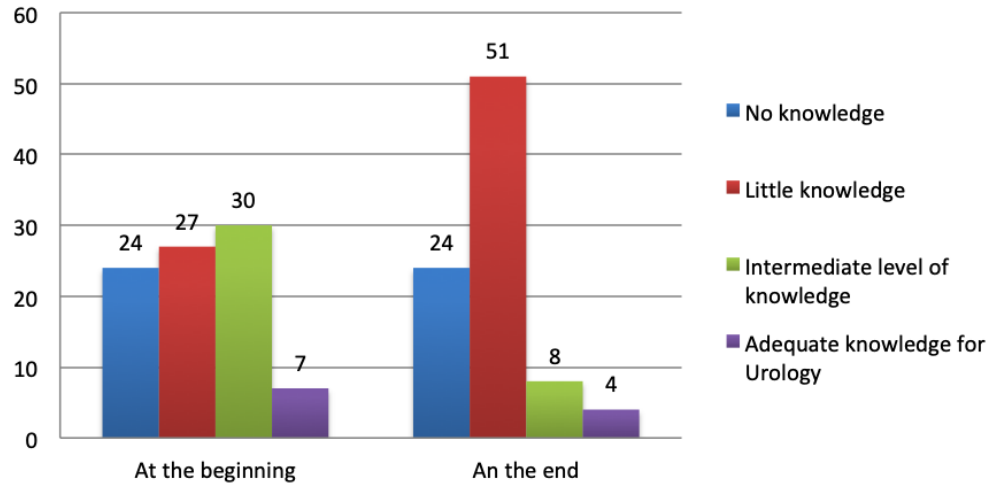

Figure 2. The results of self-assessment questions about the knowledge of HBOT in Fournier's Gangrene (Data were expressed as a number)

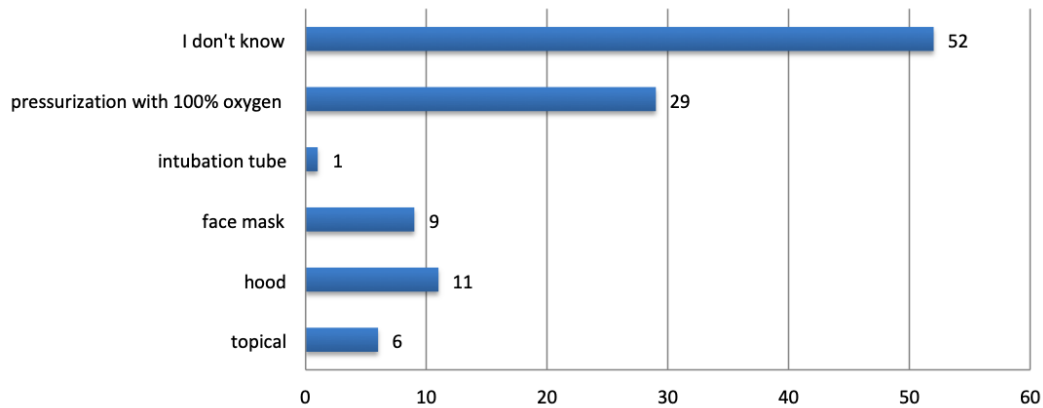

Figure 3. The answers of the Urology physicians' about the oxygen delivery methods during HBOT (Data were expressed as numbers)

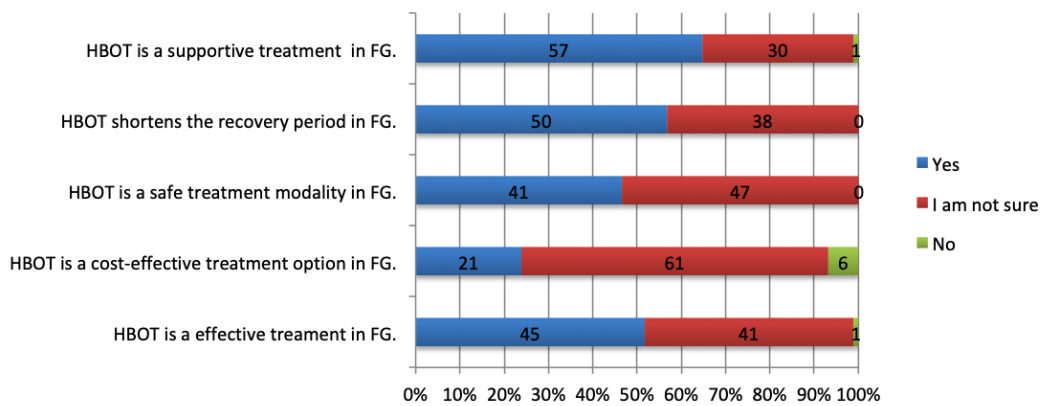

Figure 4. The opinions of Urology physicians' about HBOT in Fournier's Gangrene Data were expressed as a number) (HBOT = hyperbaric oxygen therapy, FG= Fournier's Gangrene)

4- Subgroup Comparisons

According to the first response of the physicians to the self-assessment of knowledge of HBOT, there was a statistically significant difference in the general opinion score of HBOT between those who did not know (n=24) and those who had low knowledge (n=63) (p=0.002) (Figure 5). Similarly, the general opinion score about HBOT application in FG was compared between experts and residency training program students, those working at universities and those working in other institutions, and those with more than ten years of experience and those with less experience. There was no significant difference (respectively, p=0.066, p=0.865, p=0.060). A detailed analysis is given in Table 3.

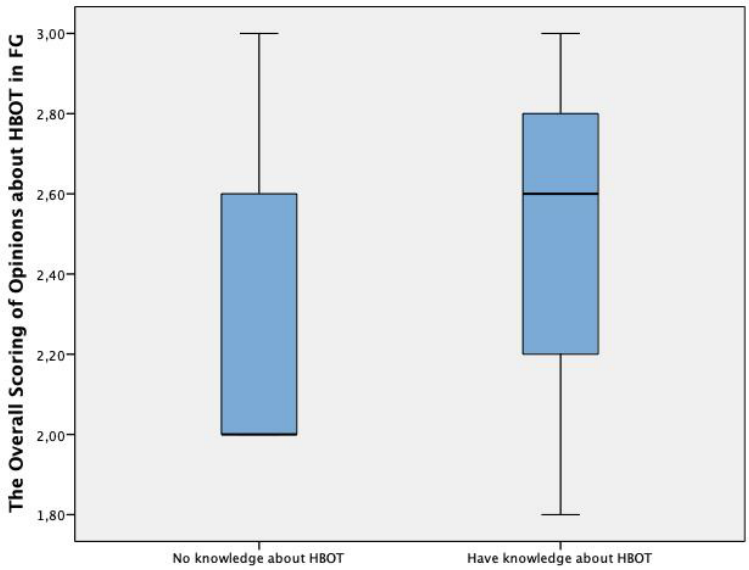

Figure 5. The comparison of the overall scoring of the Urology physicians' opinions about HBOT in Fournier's Gangrene between subgroups according to knowledge self-assessment about HBOT (Mann-Whitney U Test was used; p=0.002) (HBOT = hyperbaric oxygen therapy, FG= Fournier's Gangrene)

Table 3. The subgroup comparisons of the Urology physicians' opinions about HBOT in Fournier's Gangrene (Data were expressed as n(%). The Chi-square test was used.)

	Residency Program Student			Expert			*P*-value
	Yes	I am not sure	No	Yes	I am not sure	No	
Hyperbaric oxygen therapy is effective in Fournier's Gangrene.	20 (43.5%)	26 (56.5%)	0	25 (62.5%)	14 (35%)	1 (2.5)%	0.093
Hyperbaric oxygen therapy is a cost-effective treatment in Fournier's Gangrene.	9 (19.6%)	32 (69.6%)	5 (10.9%)	12 (29.3%)	28 (68.3%)	1 (2.4%)	0.214
Hyperbaric oxygen therapy is a safe treatment modality in Fournier's Gangrene.	17 (37%)	29 (%63%)	0	24 (58.5%)	17 (41.5%)	0	***0.044****
Hyperbaric oxygen therapy shortens the recovery period in Fournier's Gangrene.	26 (56.5%)	20 (43.5%)	0	23 (56.1%)	18 (43.9%)	0	0.968
Hyperbaric oxygen therapy is a supportive treatment option in Fournier's Gangrene.	25 (54.3%)	21 (45.7%)	0	31 (75.6%)	9 (22%)	1 (2.4%)	***0.046****

	University			Other institutions			
	Yes	**I am not sure**	**No**	**Yes**	**I am not sure**	**No**	
Hyperbaric oxygen therapy is effective in Fournier's Gangrene.	15 (57.7%)	11 (42.3%)	0	30 (49.2%)	30 (49.2%)	1 (1.6%)	0.649
Hyperbaric oxygen therapy is a cost-effective treatment in Fournier's Gangrene.	4 (15.4%)	22 (84.6%)	0	17 (27.4%)	39 (62.9%)	6 (9.7%)	0.087
Hyperbaric oxygen therapy is a safe treatment modality in Fournier's Gangrene.	15 (57.7%)	11 (42.3%)	0	26 (41.9%)	36 (58.1%)	0	0.176
Hyperbaric oxygen therapy shortens the recovery period in Fournier's Gangrene.	12 (46.2%)	14 (53.8%)	0	38 (61.4%)	24 (38.7%)	0	0.191
Hyperbaric oxygen therapy is a supportive treatment option in Fournier's Gangrene.	16 (61.5%)	10 (38.5%)	0	41 (66.1%)	20 (32.3%)	1 (1.6%)	0.710
	No knowledge about HBOT			**Have knowledge about HBOT**			
	Yes	**I am not sure**	**No**	**Yes**	**I am not sure**	**No**	
Hyperbaric oxygen therapy is effective in Fournier's Gangrene.	7 (29.2%)	17 (70.8%)	0	38 (60.3%)	24 (38.1%)	1 (1.6%)	***0.022****
Hyperbaric oxygen therapy is a cost-effective treatment in Fournier's Gangrene.	2 (8.3%)	21 (87.5%)	1 (4.2%)	19 (29.7%)	40 (62.5%)	5 (7.8%)	0.072
Hyperbaric oxygen therapy is a safe treatment modality in Fournier's Gangrene.	5 (20.8%)	19 (79.2%)	0	36 (56.3%)	28 (43.8%)	0	***0.003****
Hyperbaric oxygen therapy shortens the recovery period in Fournier's Gangrene.	9 (37.5%)	15 (62.5%)	0	41 (64.1%)	23 (35.9%)	0	***0.025****
Hyperbaric oxygen therapy is a supportive treatment option in Fournier's Gangrene.	10 (%1.7%)	14 (58.3%)	0	47 (73.4%)	16 (25%)	1 (1.6%)	***0.012****

DISCUSSION

While 27.3% of the participants did not know about the HBOT application in FG, only three physicians (3.4%) did not believe HBOT was beneficial. Besides, the majority (n=51, 56.4%) never referred their FG patients for HBOT. Finally, physicians who did not know about HBOT had more negative opinions about HBOT's application in FG (p=0.002).

We may refer our patients to other treatment options that we did not apply. It is essential for physicians specializing in other medical fields to know how this treatment is applied, its complications, and contraindications. We should have adequate knowledge of the treatments we refer to. In this study, 27.3% of urology physicians were found to have no knowledge of HBOT administration in FG.

HBOT has been used successfully in a variety of diseases (13.14). HBOT is a treatment method in which the patient breathes 100% oxygen in a closed room pressurized to at least 1.4 atmospheres (ATA). Oxygen can be inhaled through a mask, hood, or endotracheal tubes or by pressurizing the environment with oxygen (13). In this study, most physicians (n=52, 57.8%) did not know the oxygen delivery methods during HBOT.

HBOT is a safe treatment method without serious complications (15,16). However, it is noteworthy that most physicians (n=44, 53.4%) in this study were unsure whether HBOT is a safe treatment. Hyperoxygenation is the main mechanism of action of HBOT (15). HBOT also enhances the oxidative killing capacity of leukocytes, suppresses the synthesis of some bacterial toxins, and augments the effects of some antibiotics.

On the other hand, it strengthens wound healing by increasing angiogenesis and cellular proliferation (13). Middle ear barotrauma, sinus barotrauma, pulmonary barotrauma, epileptic seizures due to central oxygen toxicity, cataract formation, and transient myopia may develop as complications (15,16). In our study, while most of the complications of HBOT were answered correctly, some physicians considered cerebrovascular accidents (n=18, 21.2%) as a complication that are not actual complications of HBOT. On the other hand, the risk of fire increases during HBOT if easily combustible materials are taken into the pressure chamber due to the high oxygen level in the pressure chamber. With the determined standards and rules, no fire cases have been reported in the multi-placed pressure chambers in the world for the last five years (15). Most Urology physicians (n=37, 42.5%) were aware of the fire risk that could develop if this study's rules were not followed. While the only definite HBOT contraindication is untreated pneumothorax, upper respiratory tract infection, emphysema, bulla or bleb in the lungs, high fever, pregnancy, and claustrophobia are considered among the relative contraindications. In patients with implanted electronic devices such as pacemakers, the operability and safety of these devices under high pressure should be tested (15.16). In our study, most physicians knew about the disruption of the pacemaker during HBOT (n=69, 76.7%), and claustrophobia might be a relative contraindication (n=36, 41.9%). In necrotizing fasciitis, it is recommended that an HBOT session be applied for 90 minutes at 2-2.5 ATA, two sessions per day in the first few days (13). In our study, the majority answered the questions about the HBOT session as they did not know. On the other hand, most physicians (n=57, 64.7%) stated HBOT is a supportive treatment consistent with the Undersea and Hyperbaric Medicine Society (UHMS) guideline (13). In this study, we noticed that most Urology physicians had adequate information about the complications and contraindications of HBOT, but their knowledge about the administration of HBOT was lacking.

There are many case series and clinical studies regarding the application of HBOT in FG patients; however, randomized-controlled double-blind studies are rare. The difficulty of planning randomized-controlled trials with a high number of patients should not be underestimated, as the disease is quite fatal, and its incidence is relatively low (13). Along with the low mortality rates reported in FG patients who underwent HBOT, two studies with a large sample size published in the last five years concluded that HBOT is an independent predictor of low mortality in FG (3-9). However, in the last guideline published by EAU, only the results of a review published in 2005 were evaluated. Emphasis is placed on the fact that all of the studies in this review were published before 2000 (11, 17). Besides this review, only Li et al. evaluated the comparative case series. In this case series, 28 FG patients with similar FG severity index scores (FGSI) were divided into two groups: those who received HBOT and those who did not. The mean number of debridements was lower, and the recovery period was shorter in the group receiving HBOT ($p<0.05$). The mean number of debridements was lower, and the recovery period was shorter in the group receiving HBOT ($p<0.05$) (6). As a result, no clear recommendation has been made about HBOT in the EAU guideline (11). UHMS emphasized that it is not possible to conduct double-blind, randomized-controlled HBOT studies due to the seriousness of FG. HBOT was recommended for use in FG and accepted as an indication based on current research (13).

Similarly, type 1 recommendation by the European Committee of Hyperbaric Medicine (ECHM) in Europe, and HBOT application in all necrotizing soft tissue infections, especially perineal gangrene, is recommended as evidence level C (14). Our study also clearly showed the lack of consensus in the current literature. In our study, most Urology physicians (n=51, 56.7%) never referred FG patients for HBOT. The 55.3% of participants who recommended HBOT stated that they only consulted for HBOT in cases where surgical debridement and antibiotherapy had failed. It is strik-

ing that Urology physicians have practical applications in line with the guidelines of the EAU association.

On the other hand, when the physicians' opinions about the HBOT application in FG were questioned, only three physicians (3.4%) thought it was not beneficial. In addition, most physicians (51.7%) stated that HBOT was an effective treatment for FG and shortened the recovery period (56.8%); this is a contradictory and striking point, with most physicians (n=51, 56.7%) never referring their FG patients to HBOT. On the other hand, most physicians were unsure about the cost-effectiveness (69.3%) of HBOT in our study, which may be because the current scientific data on HBOT has not yet been examined in detail by Urology societies; detailed information is not given in the Urology guides. While urology physicians have a positive point of view about HBOT application in FG in general, it is obvious that more studies should be conducted, and Urology associations should discuss the results of HBOT. Our study determined that physicians who knew HBOT had more positive opinions about HBOT in FG than physicians who did not know. (p=0.002) This result again shows us the importance of closing the knowledge gap among physicians.

There were no presentations about HBOT in FG at the American Urological Association (AUA), European Urological Association (EAU), and Turkish Urology Association annual meetings in the last three years (18-26). When the term "hyperbaric oxygen AND Fournier's gangrene" was searched in the Dergipark database, only one case series and a review about anaerobic soft tissue infections were found (27). The small amount of literature and the absence of any statement on this subject in meetings may explain physicians' low level of knowledge and interest in HBOT for FG. On the other hand, it is emphasized in the literature that there are few HBOT centers, and HBOT is a costly treatment, the fees of which are between 8000-25000 EUR per patient; among the main reasons, HBOT is less preferred in FG patients (5). Indeed, the number of HBOT centers globally and in our country is limited (28, 29). However, accessibility to HBOT centers in our country is relatively better than in other countries. While there are 20 HBOT centers in France, there is at least one HBOT center in only 23 provinces in our country (29, 30).

On the other hand, HBOT is a very cheap treatment in our country compared to other countries. In the Public Health Services Price Schedule dated 16.12.2021, one "2-3 ATA HBOT session" was determined as 135 Turkish Liras (30). In addition, FG has been accepted as a reimbursed HBOT indication under HPC (10). For this reason, scientific studies can be carried out easily in our country. Urology physicians should increase their experience with HBOT and participate in or conduct scientific studies on this subject. It will clarify their opinions on HBOT. In our study, the number of physicians who answered the questions about HBOT as "indecisive" was relatively high.

Increasing awareness about HBOT in the Urology community is critical. Seven physicians who participated in our study stated that there was no HBOT center in their city. It is noteworthy that two of these physicians work in Ankara, where there are four HBOT centers. In addition, 13 physicians did not have any information about available HBOT centers. It is evident that physicians, who participated in this study, do not have enough awareness about HBOT. We found that very few physicians had been in an HBOT center before (n=12, 13.3%) and had participated in a study related to HBOT (n=15, 16.7%). Since there is no HBOT center in every province in our country, the chance of our physicians visiting an HBOT center during their education in Medical Faculty and residency training is really low (29). However, adding a lecture on HBOT to the urology residency training programs or discussing literature on this subject in lectures could, at least in theory, increase doctors' awareness.

The main limitation of this study is that we do not have a sample that reflects the whole of our country. Other limitations are the uneven distribution of our sample number according to provinces, titles, and institutions; the length of the questionnaire; and the relatively small number of samples.

CONCLUSION

The lack of interest of Urology physicians in HBOT, their hesitancy about the effectiveness of HBOT in FG, and their relatively low experience with HBOT in their daily clinical practice were demonstrated in this study. However, given the encouraging outcomes in the

existing literature, HBOT application following surgical debridement under emergency conditions may be life-saving. For this reason, Urology physicians should be encouraged to discuss HBOT-related literature during their residency training or to address this issue in residency training courses, to increase clinical experience with HBOT application in FG, to conduct or participate in scientific studies about HBOT applications in FG, to share these studies in Urology meetings, and to publish them in Urology journals. We think that awareness can be raised by drawing attention to this issue. Last but not least, we believe that bringing this topic up for debate by national and international Urology associations and going into more detail about it in the guidelines may grab the interest of all urology doctors.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by Health Sciences University Non-Invasive Investigation Ethical Committee (Approval: 2021-424, Date: 2021/16/12) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; KÖK, KCD, Data acquisition; KÖK, KCD, Data analysis and interpretation; KÖK, Drafting the manuscript; KÖK, KCD, Critical revision of the manuscript for scientific and factual content; KÖK, KCD, Statistical analysis; KÖK, Supervision; KÖK.

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Original Research / Özgün Araştırma

The impact of COVID-19 pandemic on urology residency in Turkey: a nationwide survey

COVID-19 pandemisinin Türkiye'deki üroloji asistanlığındaki etkisi

Arif Kalkanlı [1], Nusret Can Çilesiz [2], Cem Tuğrul Gezmiş [1], Coşkun Kaya [3], Onur Fikri [1], Ateş Kadıoğlu [4]

1. Taksim Education and Research Hospital, Department of Urology, Istanbul, Turkey
2. Biruni University Hospital, Department of Urology, Istanbul, Turkey
3. Eskisehir City Hospital, Department of Urology, Eskisehir, Turkey
4. Istanbul University, School of Medicine, Section of Andrology, Department of Urology, Istanbul, Turkey

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Yazışma / Correspondence
Arif Kalkanlı
Taksim Eğitim Araştırma Hastanesi
İstanbul / Türkiye
E-mail: arifkalkanli@gmail.com
Tel: +90 506 740 22 54

ORCID

A.K.	0000-0001-6509-4720
N.C.Ç.	0000-0003-2115-698X
C.T.G.	0000-0002-1634-4516
C.K.	0000-0002-7445-2304
O.F.	0000-0002-5731-4620
A.K.	0000-0002-5767-4837

Özet

Amaç: Hayatın her alanını etkisi altına alan Covid-19 pandemisi, akademik ve sağlık hizmetlerini de derinden etkilemiştir. Daha önce pandeminin Türkiye'deki üroloji asistanlarının akademik ve sağlık hizmetleri üzerindeki etkilerine ilişkin herhangi bir değerlendirme yapılmamıştır. Biz çalışmamızda bunu değerlendirmeyi amaçladık.

Gereç ve Yöntemler: Anket dört ana başlıkta (eğitim ve araştırma faaliyetleri, sağlık hizmetlerinde çalışma koşulları, sosyal-psikolojik etkiler ve kişisel sağlık) toplam 31 sorudan oluşmakta ve Temmuz-Ağustos 2020 tarihleri arasında gerçekleştirilmiştir. Türkiye'de 89 üroloji eğitim merkezi olup, bunların 76'sı (%85,4; 38 üniversite ve 38 devlet hastanesi) anketi doldurmuş ve geri dönmüştür.

Bulgular: Asistanların ortalama haftalık eğitim saatleri azaldı (2,43±2,46 saatten 1,3±1,8 saate; p=0,00) ve 67 merkez (%88,15) web seminerleri ve video konferans gibi yeni teknolojileri kullandı.

Haftalık araştırma faaliyetlerine ayrılan süre de pandemi sırasında azaldı (2,15±2,54 saatten 1,8±1,93 saate; p<0.001). Üniversite hastaneleri araştırma faaliyetlerini artırırken (%9,9) devlet hastanelerinde ise azaldı (%44). Haftalık ortalama poliklinik saati 86.23±86.54'ten 37.22±19.88'e (p<0.001) geriledi ve devlet hastanelerinde (%63.61) üniversite hastanelerine (%42.41) göre daha yüksekti (p<0.05). Pandemi öncesi döneme göre haftalık ameliyat sayısında önemli bir azalma gözlendi (40.7±24.25'ten 14,3±16.44'e; p<0.001). Ayrıca 74 merkez (%97,36) acil ürolojik vakaları

Abstract

Objective: The Covid-19 pandemic, which affects all areas of life, has also deeply affected academic and health services. There has previously been no assessment of the effects of the pandemic on the academic and health services of urology residents in Turkey, for this purpose, a survey was conducted.

Material and Methods: The survey consisted of a total of 31 questions under four main topics (education and research activities, working conditions in health services, social-psychological effects, and personal health) and was carried out between July-August 2020. The survey was 89 urology training centers in Turkey; among them, 76 (85.4%; 38 universities and 38 state hospitals) completed and returned the questionnaire.

Results: The average weekly education hours decreased (2.43±2.46 hours to 1.3±1.8 hours; p=.00) and 67 centers (88.15%) used new technologies such as webinars and videoconferencing.

The time devoted to weekly research activities also decreased during the pandemic (2.15±2.54 hours to 1.8±1.93 hours; p<0.001). However, university hospitals increased their research activities (9.9%), while state hospitals decreased (44%). The average weekly outpatient clinic hours decreased from 86.23±86.54 to 37.22±19.88 (p<0.001) and the regression was higher in state hospitals (63.61%) compared to university hospitals (42.41%) (p <0.05). A significant decrease was observed in the number of operations per week compared to the pre-pandemic period (from

The study was approved by Gaziosmanpaşa Training and Research Hospital Clinic Investigations Ethic Committee (Approval No: 2020-116, Date: 2020/06/23). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

uygulamaya devam ettiğini, 41 merkez (%53,9) toplam çalışma saatlerinin azaldığını, 72 merkez (%94,7) ise üroloji dışı alanlarda Covid poliklinikleri veya hizmetleri gibi çalıştığını bildirdi.

Asistanlar için 10 merkez (%13.15) çocuk bakımı, 55'i (%72.36) konaklama, 18'i (%23.68) ulaşım sağladı fakat 33 merkez (%43.42) kişisel koruyucu donanımdan yoksundu. 26 merkez (%34.21) komorbiditesi olan çalışanlarına izin verdi. Asistanlar 57 merkezde (%75) yeterli cerrahi vaka olmamasından, 73 merkezde (%96.05) Kovid-19'un ailesine bulaşmasından ve 34 merkezde (%44.73) ailelerini korumak için evlerinden taşınmış olmasından endişe duyuyorlardı. Ayrıca 25 merkezde (%32.89) asistan izole edilmiş, 54 merkezde (%71.85) hastalık sorgusu (şüphe) nedeniyle sürüntü alınmıştır. Asistanlara 14 merkezde (%18.42) Kovid-19 teşhisi konuldu.

Sonuç: Bu araştırma, Covid-19 pandemisinin yaşamın tüm alanlarını etkilediği gibi üroloji asistanlarının akademik (eğitim ve araştırma), sosyal ve psikolojik yaşamlarında da ciddi olumsuzluklara neden olduğunu göstermiştir.

Anahtar Kelimeler: COVID-19, asistanlık, pandemi, üroloji eğitimi, cerrahi eğitim

40.7±24.25 to 14.3±16.44; p<0.001). In addition, 74 centers (97.36%) reported that they continued to perform emergency urological cases and 41 centers (53.9%) reported that the total working hours decreased, but 72 centers (94.7%) reported that they were employed in non-urology areas such as Covid outpatient clinics or services.

For the residents, 10 centers (13.15%) provided childcare, 55 centers (72.36%) provided accommodation, and 18 centers (23.68%) provided transportation, but 33 centers (43.42%) lacked protective personal equipment and 26 centers (34.21%) gave leave to employees with comorbidity. Residents were concerned about not having enough surgical cases in 57 centers (75%), the transmission of Covid-19 to their family in 73 centers (96.05%), and in 34 centers (44.73%), they had moved away from their homes to protect their families. Furthermore, residents were isolated in 25 centers (32.89%) and swabs were taken in 54 centers (71.85%) due to the query (doubt, suspicion) of illness. Residents were diagnosed with Covid-19 in 14 centers (18.42%).

Conclusion: This survey has shown that as the Covid-19 pandemic affects all areas of life, it also causes serious negatives in the academic (educational and research), social, and psychological lives of urology residents.

Keywords: COVID-19, residency, pandemic, urology training, surgical training

INTRODUCTION

A highly contagious new strain of the coronavirus family (SARS-Cov-2) causing respiratory system infections and high mortality rates was discovered in December 2019 in Wuhan, China (1). The Covid-19 epidemic quickly spread around the world in February and March, and World Health Organization (WHO) officially declared it as a pandemic on March 11, 2020 (2). The first cases in Turkey were announced in March, and the virus spread to affect the entire health system, as was the case in many other countries (3). Throughout this process, a number of precautions were taken, such as increasing intensive care unit capacity, postponing elective surgeries, decreasing outpatient clinic hours, and assigning large numbers of doctors to the treatment of Covid-19 patients regardless of their area of specialty (3). These changes in health institutions had a significant impact on residents in urology. Therefore, a large-scale assessment regarding the effects of the pandemic on academic development and the health services provided by the residents in urology became necessary. This study, which to our knowledge, is the first to assume this task, aims to investigate the impact of the pandemic on academic activities (education & research), working conditions, psychosocial factors, and the personal health of urology residents in Turkey.

MATERIAL AND METHODS

After receiving the approval letter from the ethics committee of Gaziosmanpasa Training and Research Hospital (with number of 116), this survey study was conducted during June and August 2020 on residents in urology at the 89 centers providing urology training in Turkey. The survey consisted of four main subsections: academic activities (education & research), working conditions in health services, psychosocial factors, and personal health. An anonymous survey was created using Google Forms and was announced to departments of urology via email by the Turkish Association of Urology. One resident from each department was asked to complete the questionnaire (Figure 1).

Data were analysed using SPSS version 22 for Windows (SPSS, Inc. Chicago, IL, USA). Non-normally

distributed variables were expressed as medians (with minima to maxima) and qualitative variables as numbers and percentages. Kolmogorov-Smirnov test was used for normality. Educational, research, outpatient clinic hours and operation numbers before and after pandemic were compared using Wilcoxon Signed rank test. Comparative differences were considered statically significant when $p<0.05$.

RESULTS

The data were collected from 7 geographical regions, 41 cities, and 76 departments (38 university hospitals, 38 research and training state hospitals of the Health Ministry) responded (Figure 2). The response rate was 85.4%. The age of 92.1% of the participants was between 20 and 30, and 84.2% were in the first two years of their residency. The results are summarized in tables.

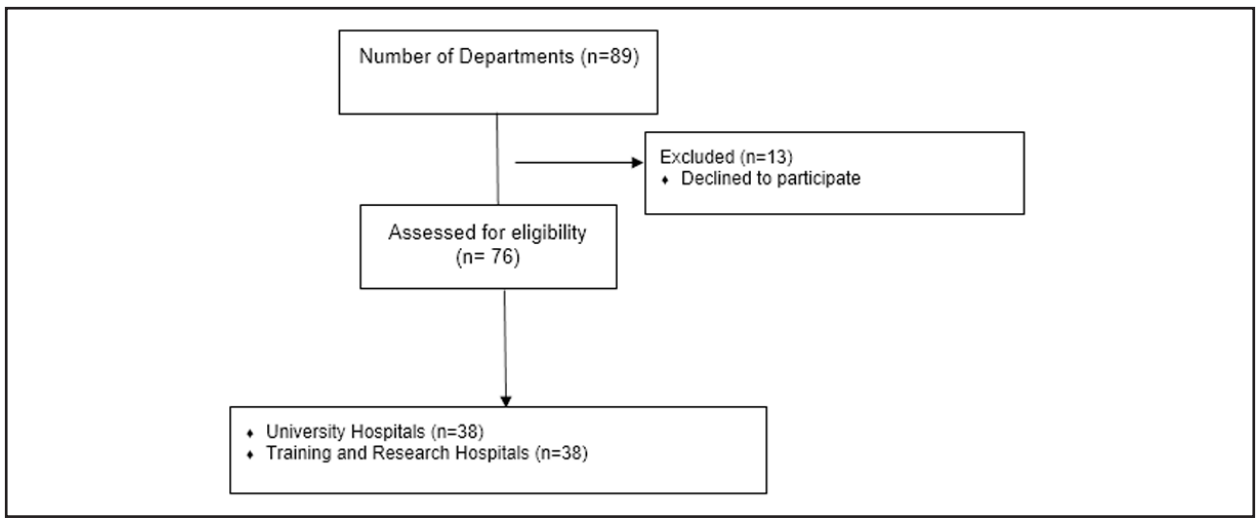

Figure 1. Flowchart of the survey

Figure 2. Coverage of the survey: 41 cities, 7 geographic region

Table 1. Participant Characteristics (n:76)

Age (years±SD)	28.35±7.11
Level of training	
First year	41.5%
Second year	43.9%
Third year	10.1%
4-5 years	4.5%
Response rate	85.4%
Geographic Region	
Marmara Region	38.1%
Aegean Region	10.5%
Mediterranean Region	10.5%
Central Anatolian Region	15.7%
Black Sea Region	14.4%
Eastern Anatolian Region	7.8%
Southeastern Anatolian Region	5.2%
Redeployed to Covid-19 clinics	94.7%
Decrease in overall total working hours	53.9%
Performed emergent urological cases	97.3%
Stopped elective surgeries	86.9%
Adequate access to PPE	56.6%
Access to childcare services	13.1%
Availability of accommodation options	72.3%
Use transportation support	23.6%
Allow staff with comorbidity to go on leave	34.2%
Anxiety about training	75%
Fears of infecting their family members	96.1%
Moving out of their houses	44.7%
Swab for Covid-19	72.85%
Ill with Covid-19	18.42%

Table 2. The effects of Covid-19 pandemic on academic activities and working conditions

	Before	**After**	**p value**
Research hours per week (±SD)	2.15±2.54	1.8±1.93	.00
Education/Seminar hours per week (±SD)	2.43±2.46	1.3±1.8	.00
Number of surgeries per week (±SD)	40.7±24.25	14.3±16.44	.00
Urology outpatient clinics hours per week (±SD)	86.23±86.54	37.22±19.88	.00

1. Education and Research Activities

Of the 76 departments, 22 reported that they had suspended all research and 46 centers that they had suspended all education activities after the pandemic had begun. The average number of educational hours per week was observed to decrease from 2 (0-25) hours to 0 (0-35 hours; p<0.001), and this decrease was more drastic in the state hospitals (62%) compared to university hospitals (27.57%) (p<0.001). However, 10 of these departments (4 university hospitals, 6 state hospitals) reported that they had not had any educational hours prior to the pandemic either. On the other hand, 10 departments reported an increase in educational activities and 67 departments (88.15%) were observed to use new technologies such as distant learning and video conferencing.

The number of weekly hours devoted to research also decreased with the pandemic (1 (0-45) hours to 0 (0-55) hours; p<0.001). However, university hospitals were seen to increase their research activities (9.9%) while a decrease was evident in the state hospitals. A significant number of these departments (n: 27, 35.52%; 9 university hospitals and 18 state hospitals) reported that they had not engaged in any research activities prior to the pandemic.

2. Working Conditions in Patient Health Care

The weekly hours for urology outpatient clinics were observed to decrease from 86.23±86.54 hours to 37.22±19.88 hours (p<0.001), and this decrease was larger in university hospitals (%42.41) compared to the state hospitals (63.61%) (p<0.001). Weekly surgery numbers were also reported to decrease significantly (37,5 (9-165) to 10 (0-90), p<0.001), which was more evident in state hospitals in comparison to university hospitals (77.02% vs 52.05%, p<0.01). Furthermore, 74 departments (97.36%) reported that they continued to undertake emergency urology cases. There were three university hospitals which preserved their work routines, and elective urology services continued in 10 departments (8 university of hospitals, 2 state hospitals). When weekly work hours were surveyed, 41 departments (53.9%) reported a decrease in overall hours, but 72 departments (94.7%) reported working in non-urology areas such as outpatient and inpatient Covid centers.

3. Psychosocial Factors

When the services provided by the institutes to residents during the pandemic were evaluated, 10 departments (13.15%) reported access to childcare services, 55 departments (72.36%) reported the availability of accommodation options, and 18 departments (23.68%) were able to use transportation support. However, 33 departments (43.42%) reported a shortage of personal protective equipment (PPE). Some departments (34.21%) were reported to allow staff with comorbidity to go on leave. When asked about the psychological effects of the pandemic, 57 departments (75%) reported anxiety about falling behind in terms of their surgical training, fears of infecting their family members were evident in 73 departments (96.05%), and 34 departments (44.73%) reported that they had moved out of their homes to protect their families.

4. Personal Health

In terms of the effects of Covid 19 on their personal health, 25 (32.89%) departments reported having residents who were isolated due to the possibility of infection, 54 departments (71.85%) reported that their residents were tested for the same reason, and there were residents diagnosed with Covid-19 in 14 departments (18.42%). Among the departments who participated in the survey, there were not any residents who had lost their lives.

DISCUSSION

The COVID-19 pandemic has affected all areas of life. The health care system had come to a standstill with the high level of hospital admissions in many countries. The unknown aspects of the disease, such as the symptoms, treatments, and potential complications caused a global crisis. To deal with the many outpatient visits and intensive care patients, guidelines were prepared by medical associations which suggested the classification of all cases as urgent/non-urgent or deferrable/non-deferrable. As a result, delays to all non-urgent operations and procedures, until the crisis has been brought under-control, aims to minimize the spread of the virus and free up healthcare professionals and hospital beds (4, 5).

This study, with its focus on the effects of COVID-19 on the urology residents in terms of their academic development, occupational conditions, psychosocial factors, and personal health, is a first in Turkey. The pandemic has had deep impacts on the urology residents of Turkey due to significant changes taking place in their lives. As is the case for many countries, the rise of COVID-19 incidences resulted in nearly all urology residents who participated in the study (94.7%) working outside their field by serving in COVID-19 outpatient and inpatient clinics as well as intensive care units. Similarly, studies conducted in United States and Europe have reported the rate of mandatory assignment to be above 80% (6, 7).

Regarding the training conditions of the urology residents in Turkey, we have observed during the pandemic that structured and applied training was either put on hold or shortened in many centers. Urology clinics in Turkey reported that they had started to use distant education or video conferencing tools (88.15%), which normally had not been a part of their programs, in order to make up for the forced interruption in training. In the United States, too, these new education and training models were utilized (8,9). Despite the new methods, 75% of the urology residents in our study reported anxiety about insufficient urology training. In a study conducted in the United States, 91% of urology residents reported that there were considering discontinuing their urology training should the pandemic continue in its present conditions (10). According to a survey conducted among urology training directors, 60% of the participants thought that residents in urology were not receiving sufficient training during the pandemic, compared to the prior conditions (7).

As for the amount of time that urology residents could spare for research activities, the impact of the pandemic has been more significant in state hospitals, compared to the university hospitals, where the interruption in urological services provided more time for research. Recent study from Europe reported that 85% residents were finding more time to conduct research during the period spent away from the clinic (6). Similarly, 77% of the residents participating in another study in the United States reported having more time for research (7). Looking at the urology research in PubMed, in 2020, there has been a significant change in the number of publications in comparison to the previous three years (2016-2019). The increase of publications in andrology, endourology, urologic infections, and urologic emergencies subsections increased by almost 30% (11).

In parallel to their academic lives, an investigation of occupational conditions of urology residents in Turkey revealed significant changes. Both applications to urology outpatient clinics and the number of elective urology surgeries have significantly decreased since the start of the pandemic. The fall in the number of clinic hours and operations have been reported to be up to 90% in other developing countries with similar economic and health parameters to Turkey and developed countries (12-21). According to our results, even though the urology outpatient services provided have decreased more significantly in university hospitals, the decrease in the number of operations is greater for state hospitals.

An evaluation of the effects of the pandemic on the psychosocial lives of urology residents has revealed that, in addition to anxieties about insufficient training, problems in obtaining protective equipment and fears of spreading the virus to family members have had a negative impact on the urology residents' psychological wellbeing. These sources of anxiety are not unique to Turkey. In the United States, almost half of the residents have been reported to have problems concerning having access to protective equipment (7). In Canada, residents were not allowed in surgery due to a shortage of protective equipment (22, 23). The fear of catching the disease and infecting family members has been reported to be common in other countries as well (7, 12-21). All these sources of anxiety affect not only the urology residents, but also the urology specialists. A study by Rajwa et. al. indicates that 57.6% of the urology specialists report feelings of worry, sadness, and fear, and 80% observed their colleagues to be negatively affected during the pandemic (16). Similar to many other countries, residents have been provided with varying degrees of accommodation, transportation, and childcare support by their affiliated institution.

In terms of the personal health of the urology residents during the pandemic, we have found that 71.85% of residents have been tested for the virus. Studies conducted in developed countries, on the other hand,

report regular tests for all heath personnel (7,22,23). Of the clinics which participated in our study, 18.42% reported that one or more residents had been diagnosed with COVID-19. This percentage, for urology residents, was reported to be 3% in the United States (7). When compared with other countries, the high positive rate in Turkey may be explained by the working conditions, insufficiency of protective equipment, and mandatory service in non-urology departments.

In this study, we did not group the residents according to their years in training. We chose one resident from each clinic, and the instruments we used for evaluating psychological status were not validated. Furthermore, our survey did not include a question regarding the residents' income, and we did not receive evaluations from the training directors. All of these factors are limitations of our study to be considered in further research.

CONCLUSION

It is well-known that COVID-19 pandemic has many challenges and affects all areas of life, it also affect the lives of medical residents. The pandemic created serious negativities in terms of academic (education and research), working conditions in patient health care, psychosocial lives and personal health of urology residents in Turkey.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by Gaziosmanpaşa Training and Research Hospital Clinic Investigations Ethic Committee (Approval No: 2020-116, Date: 2020/06/23) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; AK, CTG, AK, Data acquisition; NCÇ, CK, OF, Data analysis and interpretation; CTG, CK, OF, Drafting the manuscript; AK, CTG, CK, Critical revision of the manuscript for scientific and factual content; NCÇ, CTG, OF, Statistical analysis; AK, AK, Supervision; AK, AK.

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Appendix

Tıpta Uzmanlık Öğrencilerinin Covid-19 Pandemisinden Etkilenme Düzeyleri

Değerli meslektaşlarımız;

Türk Üroloji Akademisi koordinatörlüğünde, "Türkiye'deki Üroloji İhtisası Yapan Tıpta Uzmanlık Öğrencilerinin COVID-19 Pandemisinden Etkilenme Düzeyleri" başlıklı anket çalışması planlanmıştır (Etik Kurul No: 2020/116). Çalışmaya pandemi süresince tıpta uzmanlık eğitimi veren kliniklerin katılımı amaçlanmaktadır. Çalışmaya dâhil olmak için anket formunu doldurmanız yeterli olacaktır.

Formun Üstü

1. Kimlik Bilgileri

Ad-Soyad:

Doğum Tarihi:

Çalıştığı Kurum

İhtisasa Başlama Tarihi:

2. Pandemi öncesi rutinde kliniğinizde haftalık üroloji poliklinik saati neydi?

3. Pandemi süresince kliniğinizde haftalık üroloji poliklinik saati neydi?

4. Pandemi öncesi rutinde kliniğinizde haftalık üroloji ameliyatı sayısı neydi?

5. Pandemi süresince kliniğinizde haftalık üroloji ameliyatı sayısı neydi?

6. Pandemi süresince kliniğinizin çalışma düzeninde değişiklik oldu mu?

- Evet
- Hayır

7. Pandemi süresince elektif üroloji hizmetleri durdu mu?

- Evet
- Hayır

8. Pandemi süresince sadece üroloji hastalarının bulunduğu serviste haftalık çalışma saatiniz değişti mi?

- Arttı
- Aynı
- Azaldı

9. Pandemi süresince her bir asistan hekimin haftalık toplam çalışma saati önceki rutine göre nasıl değişti?

- Arttı
- Aynı
- Azaldı

10. Pandemi süresince kliniğinizdeki asistan hekimler üroloji pratiği dışında görevlendirildi mi? (örneğin: Covid servisi-polikliniği)

11. Pandemi öncesinde kliniğinizde haftalık teorik eğitim ve seminerler için ayrılan süre kaç saat idi?

12. Pandemi süresince kliniğinizde haftalık teorik eğitim ve seminerler için ayrılan süre kaç saat idi? (uzaktan eğitim, video konferans vb. dahil)

13. Pandemi öncesinde kliniğinizde araştırma için ayrılan süre kaç saat idi?

14. Pandemi süresince kliniğinizde haftalık araştırma için ayrılan süre kaç saat idi?

15. Pandemi süresince uzaktan eğitim, videokonferans vb. yeni teknolojileri eğitim ve araştırma çalışmalar için kullandınız mı?

- Evet
- Hayır

16. Yeterli cerrahi vakaya girememe endişesi yaşadınız mı?

- Evet
- Hayır

17. Acil üroloji vakalar yapıldı mı?

- Evet
- Hayır

18. Elektif ürolojik cerrahiler yapıldı mı?

- Evet
- Hayır

19. Ailenize hastalık bulaştırma endişesi duydunuz mu?

- Evet

- Hayır

20. Çocuk bakımı konusunda çalıştığınız kurum tarafından destekte bulunuldu mu?

- Evet
- Hayır

21. Pandemi süresince evinizden ayrı yaşamak zorunda kaldınız mı?

- Evet
- Hayır

22. Pandemi süresince çalıştığınız kurum tarafından konaklama imkânı sunuldu mu?

- Evet
- Hayır

23. Pandemi süresince çalıştığınız kurum tarafından ulaşım imkânı sunuldu mu?

- Evet
- Hayır

24. Çalıştığınız kurumda çalışma alanlarında sosyal mesafe ile maruziyeti düşürmek için çalışma yapıldı mı?

- Evet
- Hayır

25. Virüse maruziyet konusunda endişe duydunuz mu?

- Evet
- Hayır

26. Kişisel koruyucu ekipmana ulaşmada eksiklik hissettiniz mi

- Evet
- Hayır

27. Çalıştığınız kurumda komorbiditesi olan çalışanlara izin verildi mi?

● Evet

● Hayır

28. Çalıştığınız kurumda karantinaya alınan asistan hekim oldu mu? (Branşı neydi?)

29. Çalıştığınız kurumda Covid-19 için sürüntü alınan veya test yapılan asistan hekim oldu mu? (Branşı neydi?)

30. Çalıştığınız kurumda Covid-19'a yakalanan asistan hekim oldu mu? (Branşı neydi?)

31. Çalıştığınız kurumda Covid-19'a yakalanan ve hayatını kaybeden asistan hekim oldu mu? (Branşı neydi?)

Formun Altı

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Original Research / Özgün Araştırma

Quality of information in YouTube videos on prostate fusion biopsy

Prostat füzyon biyopsisi ile ilgili YouTube videolarındaki bilgilerin kalitesi

Tahsin Batuhan Aydogan[1]

1 Liv Ankara Hospital, Department of Urology, Ankara

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Yazışma / Correspondence
Tahsin Batuhan Aydogan
Liv Hospital Ankara Department of Urology, Kavaklidere Mah., Bestekar sok. No:8 Ankara / Türkiye
E-mail: drbatu@hotmail.com
Tel: +90 532 436 00 79

ORCID
T.B.A. 0000-0002-2000-7790

Özet

Amaç: Bu çalışmanın amacı, MRI-TRUS prostat füzyon biyopsisi ile ilgili YouTube'daki videoların kalitesini değerlendirmektir.

Gereç ve Yöntemler: 16 Mart 2022 tarihinde "MRI-TRUS prostat füzyon biyopsisi" başlığı ile YouTube taraması yapılmıştır. İlk 70 video, sıralama kriteri olarak "alaka düzeyi" seçilerek değerlendirildi. Video içeriklerinin kalitesi, uluslararası geçerliliği olan Journal of the American Medical Association Benchmark Score (JAMAS) ve Global Quality Score (GQS) kullanılarak değerlendirildi. Araştırmacı ayrıca videoların teknik içeriğini değerlendirmek için MRI-TRUS Prostat Füzyon Biyopsi Skorunu (MTPFBS) geliştirdi. Videoların yüklenme kaynağı ve uzunluğu, izlenme sayısı, beğeni ve beğenmeme oranları, video güç indeksleri (VPI) değerlendirildi.

Bulgular: Akademik merkez kaynaklı hazırlanan video içerikleri, bilimsel toplantı veya özel kurum videolarına kıyasla anlamlı olarak daha yüksek GQS puanlarına sahipti. Özel kurum kaynakları tarafından hazırlanan video içeriklerinin MTPFBS ve JAMA puanları diğer videolara göre anlamlı derecede düşüktü ($p<0.05$). Bilgi aktarımı türüne göre hem sesli hem de yazılı olarak yüklenen videoların JAMAS ve MTPFBS'nin tek başına sesli videolara göre anlamlı olarak daha yüksek olduğu görülmüştür ($p<0.05$). Videoların uzunluğu JAMA ve MTPFBS ile pozitif korelasyon gösterdi. VPI ve beğeni sayısı güçlü bir korelasyon gösterdi. VPI veya beğeni sayısı GQS, JAMAS ve MTPFBS puanları ile herhangi bir korelasyon göstermedi.

Sonuç: YouTube'daki MRI-TRUS prostat füzyon biyopsisi videolarının kalitesi belirgin düzeyde düşüktü. Uzman hekimler ve akademik merkezlerce hazırlanmış video içerikleri ile daha kaliteli bilgiler aktarılabilir. Bu nedenle güncel veriler sonucunda video içeriklerinin izlenmesi önerilmeyebilir.

Anahtar Kelimeler: multiparametrik manyetik rezonans görüntüleme, prostat, internet

Abstract

Objective: The aim of this study is to evaluate the quality of videos on YouTube related to MRI-TRUS prostate fusion biopsy.

Material and Methods: A YouTube search was made on March 16, 2022, for the videos related to "MRI-TRUS prostate fusion biopsy". The first 70 videos were ranked during this study by choosing "relevance" as a criterion. Video content quality was evaluated using the internationally validated Journal of the American Medical Association Benchmark Score (JAMAS) and Global Quality Score (GQS). The researcher also developed MRI-TRUS Prostate Fusion Biopsy Scoring (MTPFBS) to evaluate videos' technical content. The upload origin and length of video view count, like and dislike ratios, and video power indexes (VPI) were all evaluated.

Results: Video content from academic center sources had significantly higher GQS scores than scientific meetings or private institution videos. Video content prepared by private institution sources had significantly lower MTPFBS and JAMA scores than other videos ($p<0.05$). According to the type of information, videos uploaded with voice and writing had significantly higher JAMAS and MTPFBS than voice alone ($p<0.05$). The length of videos showed a positive correlation with JAMA and MTPFBS. VPI and the number of likes showed a strong correlation. However, VPI or the number of likes did not correlate with GQS, JAMAS, and MTPFBS scores.

Conclusion: Evaluated on YouTube, the MRI-TRUS prostate fusion biopsy videos were low quality. In that regard, videos prepared by specialists and academic centers should be standardized to transfer better quality information. According to current data, watching these video contents may not be recommended.

Keywords: multiparametric magnetic resonance imaging, prostate, internet

All research was performed in accordance with relevant guidelines/regulations.

INTRODUCTION

Prostate cancer is the second most common cancer in the male population in the world and ranks sixth in cancer-related deaths (1). Further examinations and evaluations have been increased among men with high PSA values. The evaluation of the prostate with multiparametric magnetic resonance imaging (MRI) is being used in men with persistent elevation in PSA value and a history of negative conventional transrectal ultrasound (TRUS) guided biopsy with the suspicious digital rectal examination (2). After evaluating MRI images following the Prostate Imaging-Reporting and Data System (PIRADS) scores, TRUS-guided images are matched, and at least 4 core biopsies are recommended for each target lesion in addition to the standard 12 core biopsy (3). A prostate biopsy can be performed under local or general anesthesia, or it can be performed transrectal or perineal route. Before the prostate biopsy procedure, there are some basic preparatory steps such as appropriate antibiotic prophylaxis, bowel cleansing, and discontinuation of anticoagulants. There are risks such as bleeding, infection, inability to urinate, and insertion of a catheter after the procedure (4).

Founded in 2005, YouTube is the world›s most widely used video sharing site. As of 2021, it is estimated that there are 2.24 billion YouTube users worldwide. The platform›s user base consists of more men than women (5). In recent years, the use of social media and the internet in the field of health and medicine has been increasing dramatically (6-8). However, information pollution is still a major handicap, and there are deficiencies in accessing accurate and quality content, including urology (9, 10). Only one study published in 2018 evaluated the YouTube videos on conventional TRUS-guided prostate biopsy; within this study, the patients› enlightenment was found insufficient (11). Although the MRI-TRUS prostate fusion biopsy has become prevalent in recent years, the videos related to MRI-TRUS prostate fusion biopsy on YouTube have not been evaluated previously. This study aims to evaluate the quality of MRI-TRUS prostate fusion biopsy videos on YouTube with validated scoring systems and the scoring system prepared with essential steps of the procedure.

MATERIAL AND METHODS

A YouTube search was done on March 16, 2022, for the videos related to "MRI-TRUS prostate fusion biopsy". During this study, the first 70 videos evaluated were ranked by choosing "relevance" as a criterion. Non-relevant videos uploaded by manufacturers with a commercial aim, non-English, and with no voice were excluded from this study. The remaining 60 videos were evaluated using the internationally validated Journal of the American Medical Association Benchmark Score (JAMAS) and Global Quality Score (GQS). JAMAS has four questions, each 0-1 point (maximum of 4 points), to assess the content's validity, effectiveness, and reliability (12). The GQS is a five-point (1-5) Likert-type scale to determine whether the content is understandable for patients (13). The researcher developed MRI-TRUS Prostate Fusion Biopsy Scoring (MTPFBS) to evaluate from the technical aspect of interventional procedure with 9 criteria each calculated as 0 or 1 (Table 1).

The videos were categorized into groups in terms of country of origin, upload source (academic center, scientific meeting/webinar, personal doctor account, and private institution), transfer of video content (voice or voice plus written), and terms of the type of concent (informative or technical). The qualifications of each video, such as length, view count, like and dislike ratios, and video power indexes, were all noted and evaluated. Like ratio (like/like + dislike) and view ratio (number of views/duration on YouTube) were also calculated. The video power index was calculated with a pre-described calculation (VPI: like ratio x view ratio / 100) (14). Since YouTube is an open online platform, we did not involve human participants. In that regard, ethics committee approval is not required for this study, and all procedures were conducted per the Helsinki Declarations of 2004.

The data were analyzed by GraphPad Prism version 9 (GraphPad Software, California, USA). The Shapiro-Wilk test was used for the normality and the distribution of variables. The chi-square and Fisher's exact tests were used for comparison between cate-

gorical variables. Numerical variables were compared using independent samples t-test or a Mann-Whitney U test. The Kruskal- Wallis and/or ANOVA tests were used to compare different score groups. Spearman correlation coefficient was used to explore the relationship between the continuous variables. A $p < 0.05$ value was considered statistically significant.

RESULTS

The numerical distribution of the evaluated 60 videos is shown in Table 2. The majority of videos were informative (%76.7), the target population was patients (%58.3), the transfer of information type was alone with voice (%51.7), country of origin was USA (%85), and uploaded from doctor accounts (%24). The median length of videos was 393 seconds. The median number of views, likes, and VPI were 5137, 18, and 0.037, respectively. The median GQS, JAMAS, and MTPFBS were 2, 2, and 3 respectively. The median values with interquartile ranges were also shown in Table 3.

Video contents prepared by academic center sources had significantly higher GQS scores than scientific meetings or private institution videos. Video contents prepared by private institution sources had significantly lower MTPFBS and JAMAS than other videos ($p<0.05$)(Figure 1)(Table 4). Considering the type of transfer of video content uploaded both as voice and writing had significantly higher JAMAS and MTPFBS than voice alone ($p<0.05$)(Figure 2). The length of videos showed a positive correlation with JAMAS and MTPFS. VPI and the number of likes showed a strong correlation. GQS, JAMAS, and MTPFBS also showed a correlation between them. However, neither VPI nor the number of likes did not show any correlation with GQS, JAMAS, and MTPFBS scores (Pearson correlation coefficient $r>0$)(Figure 3). In Figure 3, the r values were given in boxes, and red circles indicate p-value <0.05 as significance.

Table 1. MRI-TRUS Prostate Fusion Biopsy Scoring (MTPFBS)a

Pre-biopsy evaluation
Demographic informations (ie. age, PSA, comorbidities/anticoagulant usage) about the case/patient stated in the video
The patient's PIRADS score stated in the video
The pre-biopsy preperation (i.e. antibiotic prophylaxis/bowel preperation) procedures stated in the video
During biopsy
The instruments/software used stated in the video
The type of anestesia (sedoanalgesia/local anesthesia) stated in the video
The number of the cores taken from each lesion stated in the video
After biopsy
The hospitalization period or discharge time stated in the video
The information on possible post-biopsy complications stated in the video
The pathology result stated in the video

MRI-TRUS: *Magnetic Resonance Imaging – Transrectal Ultrasonogprahy,* ***PSA:*** *Prostate spesific antigen,*
PIRADS: *Prostate Imaging-Reporting and Data System*
a One point for 'yes' for each statement.

Table 2. The numerical distribution of videos

	N=60 (%)
Video content	
Informative	46 (76.7)
Technical	14 (23.3)
Target Population	
Physicians	25 (41.7)
Patients	35 (58.3)
Transfer of information	
Voice	31 (51.7)
Voice plus writing	29 (48.3)
Country of Origin	
USA	51 (85)
Europe	6 (10)
Asia	3 (5)
Upload Source	
Academic center	14 (23.3)
Scientific meeting	11 (18.3)
Doctor	24 (24)
Private Institution	11 (18.3)

N*=number of video*

Table 3. The characteristics of the videos

Variable	**Median (IQR)**
Length of video (seconds)	393 (189.3-932.8)
Time since upload (days)	1372 (877-2146)
Number of views	5137 (79-13779)
Number of like	18 (5.25-51)
Number of dislike	0
VPI (like ratio x view ratio /100)	0.037 (0.011-0.114)
GQS	2 (2-3)
JAMAS	2 (1-2)
MTPFBS	3 (1-4)

Values median and IQR(Interquartile Range),

VPI: *Video power index,* ***GQS:*** *Global Quality Score,*

JAMAS: *Journal of the American Medical Association Benchmark Score,*

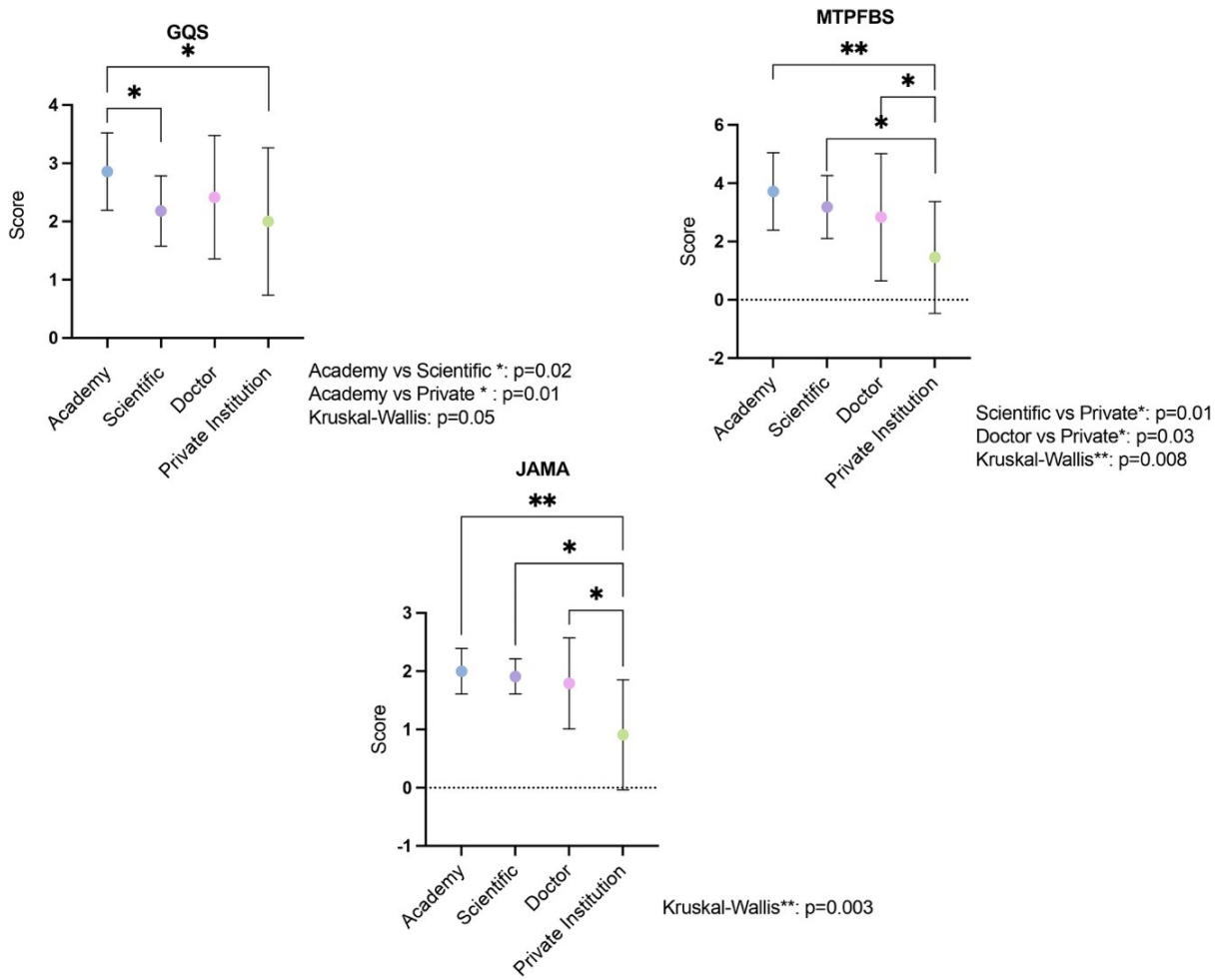
MTPFBS: *Prostate Fusion Biopsy Score.*

Table 4. The comparison of scores according to the upload sources

	Academic Center (n=14)	Scientific Meeting (n=11)	Doctor (n=24)	Private Institution (n=11)	p value
GQS	3 (2-3)	2 (2-3)	2 (2-3)	2 (1-3)	0.05
JAMAS	2 (2-2)	2 (2-2)	2 (1-2)	1 (0-1)	0.003*
MTPFBS	3 (3-5)	3 (2-4)	2 (1-4)	1 (0-3)	0.008*
VPI	0.044 (0.016-0.51)	0.011 (0.005-0.087)	0.03 (0.01-0.251)	0.058 (0.018-0.131)	0.477

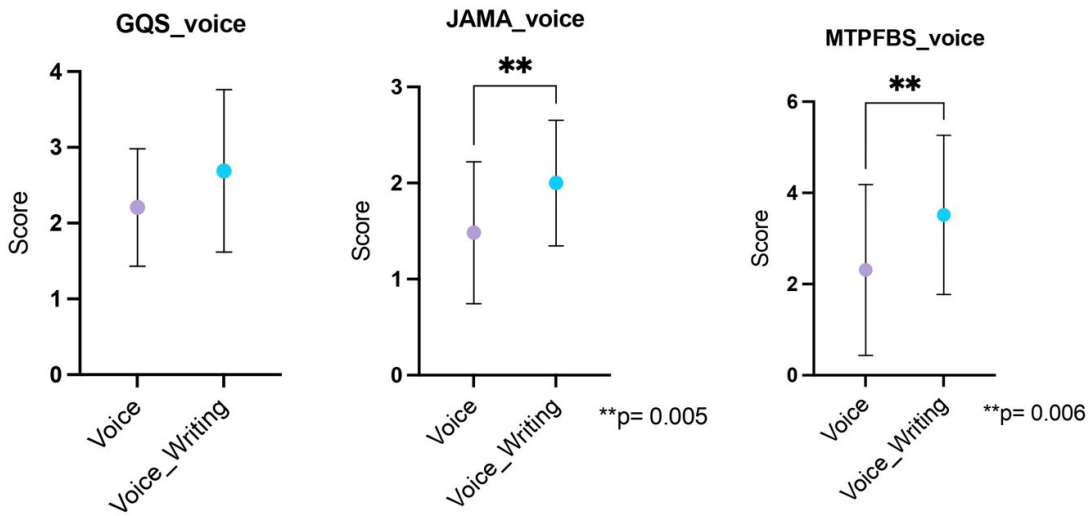
Values median and IRQ (Interquartile range). ***VPI:*** *Video power index,* ***GQS:*** *Global Quality Score,*
JAMAS: *Journal of the American Medical Association Benchmark Score,*
MTPFBS: *Prostate Fusion Biopsy Score. Groups compared by Kruskal-Wallis test.*
**p<0.05 significant.*

Figure 1. The comparison of validated scores according to video upload sources



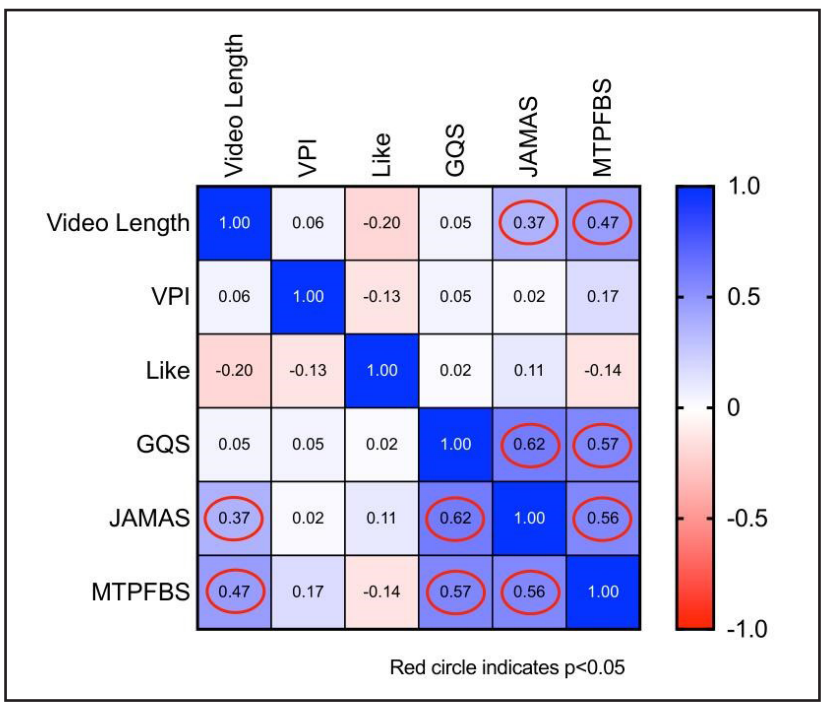
GQS: *Global Quality Score,* ***MTPFBS:*** *MRI-TRUS Prostate Fusion Biopsy Scoring,*
JAMA: *Journal of the American Medical Association Benchmark Score.*

Figure 2. The comparison of validated scores according to transfer of video content as voice +/- writing



GQS: *Global Quality Score,* ***JAMA:*** *Journal of American Medical Association Benchmark Score,*
MTPFBS: *MRI-TRUS Prostate Fusion Biopsy Scoring.*

Figure 3. The correlation of video lenght, number of like and VPI with validated scores



VPI: *Video power index (like ratio x view ratio / 100), Like: Like ratio (like / like + dislike),* ***GQS:*** *Global Quality Score,*
JAMAS: *Journal of the American Medical Association Benchmark Score,*
MTPFBS: *MRI-TRUS Prostate Fusion Biopsy Scoring*

DISCUSSION

Prostate cancer is a common fear among aging men. The social media and internet search regarding screening protocols and diagnostic techniques have been increasing worldwide (15). Jain at el investigated YouTube as a source of patient information for TRUS guided biopsy of the prostate in 2017 with the evaluation of a total of 41 videos (11). However, the MRI-TRUS prostate biopsy videos were excluded from this study that was conducted in 2017. Independent three authors evaluated the content of videos based on the written information form for patients prepared by the British Association of Urological Surgeons (BAUS). The majority of videos were rated as very poor (n=32), and none of the videos were accepted as excellent quality. The BAUS criteria included pre-biopsy preparation steps, description of steps of the procedure, possible side-effects, recovery, and post-interventional periods. Depending on BAUS criteria, the authors discovered that the video contents mainly lacked information on alternatives to TRUS biopsy, repetition of PSA test, MRI-TRUS evaluation, post-interventional fever, and hematuria with management (11). The validated international scores such as GQS, JAMAS, or DISCERN were not used (12, 14, 16). However, we believe the combination of validated international scores and a separate scoring system containing the essential steps of the process shall be better for evaluation.

The minimum and maximum duration of the videos were 46 and 2965 seconds, respectively. The median duration of videos was 393 seconds, and it was previously mentioned in the previous TRUS biopsy study that videos longer than 600 seconds can deter viewers(11). Video duration of fewer than 120 seconds or more than 600 seconds included in the evaluation could be a limitation. However, there is a positive correlation between video length with JAMAS and MTP-FBS (Figure 3). So, it can be said that a certain period is required to give an adequate and understandable message.

We discovered that MRI-TRUS prostate biopsy YouTube video contents were mainly lacking in providing information on PIRADS scoring sensitivity and specificity or time interval of pathological examination and other possible scenarios after pathology results. Pure scientific content and content provided by private institutions do not meet patients› expectations (Figure 1), which may result in the fact that videos uploaded by scientific meetings/webinars are mainly difficult to understand by the population. Moreover, videos uploaded from private institutions generally lack basic information, while partly due to commercial concerns, it does not present the steps of the procedure one by one in the light of possible complications and risks. Considering the target audience, which is the elderly male population, the videos with voice and written information can be more understandable (Figure 2). Like ratios or VPI did not show any positive correlation with validated scores, so the number of likes or views should not be evaluated as the quality of the video content. By taking into consideration all data, it is necessary to increase the consciously selected and uploaded content instead of the uploaded videos regardless of what they contain.

Today, more than 1600 studies on literature are related to certain medical contents of YouTube videos (17). In the discipline of urology, more than 90 YouTube publications exist in the literature (18). Although most studies concluded that the quality and content of YouTube videos seemed inadequate, there are. However, a few studies indicated that YouTube video contents were adequate (19-23). Experts should prepare the contents and accessibility of the society to accurate and understandable information should be supported (22, 23). In these studies, which support the acceptable content of YouTube, topics such as non-invasive procedures, examination, and therapy methods seem to be in the foreground. We believe that there is a need for an understandable step-by-step transfer of the content about interventional procedures such as biopsy and surgical techniques by experts. Our results show that the overall scores seem low; however, video content prepared by academic centers or specialists looks more informative for patients.

CONCLUSION

The overall video quality on MRI-TRUS prostate fusion biopsy on YouTube was low. When internet search and social media users are becoming more and more widespread, better quality and standardized con-

tent should be prepared by experts about MRI-TRUS prostate fusion biopsy for the prospective patients to be better informed about the procedure. Only then could it be advisable to watch these videos.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Patient data did not use in the study.

Ethical Approval

The design of the study does not require ethical committee approval. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design: TBA, Data acquisition: TBA, Data analysis and interpretation: TBA, Drafting the manuscript: TBA, Critical revision of the manuscript for scientific and factual content: TBA, Statistical analysis: TBA.

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Original Research / Özgün Araştırma

Risk factors for intravesical recurrence after radical nephrourethrectomy in upper urinary tract urothelial tumors: retrospective single-center study

Üst üriner trakt ürotelyal tümörlerinde radikal nefroüretrektomi sonrası intravezikal nüks için risk faktörleri: retrospektif tek merkezli çalışma

Taner Kargı, Mithat Ekşi

University of Health Sciences, Bakırköy Dr. Sadi Konuk Training and Research Hospital, Department of Urology, İstanbul, Turkey

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Yazışma / Correspondence
Mithat Ekşi
Dr.Sadi Konuk Hospital, Department of Urology, Zuhuratbaba, Dr. Tevfik Sağlam Cd No:11, 34147, Bakırköy,
İstanbul / Türkiye
E-mail: mithat_eksi@hotmail.com
Tel: +90 506 252 82 83

ORCID
T.K. 0000-0001-5874-3489
M.E. 0000-0003-1490-3756

Özet

Amaç: Üst üriner sistem karsinomu (UTUC) nedeniyle radikal nefroüreterektomi (RNU) uygulanan hasta serimizde mesane kanserinin metakron nüksünü öngören faktörleri inceledik.

Gereç ve Yöntemler: Merkezimizde Eylül 2009 ile Mart 2020 tarihleri arasında UTUC kaynaklı RNU olan hastalar çalışmaya dahil edildi. Hastalar intravezikal nüks (IVR) olan ve olmayan olarak sınıflandırıldı ve nüksü öngören faktörler değerlendirildi.

Bulgular: Çalışmaya toplam 50 hasta dahil edildi. Toplam 50 hastanın 19›unda (%38) IVR gelişmiştir ve ortalama takip süresi 39,5 ± 25,3 aydır. Demografik özellikler, başvuru hemoglobini, glomerüler filtrasyon hızı ve hidronefroz derecesi, preoperatif üreterorenoskopi ve sitoloji pozitiflik öyküsü açısından iki grup arasında anlamlı fark yoktu (p>0.05). IVR (+) grubunda anlamlı olarak daha fazla mesane kanseri öyküsü vardı (sırasıyla %35,5'e karşı %52,6, p=0.019). Üreter tümörü olan hasta sayısı IVR (-) grubunda 10 (%32,3) iken IVR (+) grubunda 9 (%47,4) idi ve anlamlı olarak daha yüksekti (p=0,04). Tüm hasta grubunda 28 (%56) T2-T4 patolojisi olan hasta vardı ve oran IVR (+) grubunda anlamlı olarak daha fazlaydı (sırasıyla %63,2 ve %51,6, p=0.038).

Sonuç: Daha önce mesane kanseri öyküsü olan hastalarda, özellikle üreteral ve yüksek patolojik T evreli UTUC'larda mesane kanserinin metakron nüksü için dikkatli olunmalıdır.

Anahtar Kelimeler: üst üriner sistem ürotelyal karsinomu, intravezikal nüks, risk faktörü, nefroüreterektomi

Abstract

Objective: We examined factors predicting metachronous recurrence of bladder cancer in our series of patients who underwent radical nephroureterectomy (RNU) for upper system urothelial carcinoma (UTUC).

Material and Methods: Patients with UTUC-induced RNU in our center from September 2009 to March 2020 were included in the study. Patients were classified as having and not having an intravesical recurrence (IVR), and the factors predicting recurrence were evaluated.

Results: A total of 50 patients were included in the study. IVR was developed in 19 (38%) of 50 patients, with a mean follow-up of 39.5 ± 25.3 months. There was no significant difference between the two groups in demographic characteristics, admission hemoglobin, glomerular filtration rate, and degree of hydronephrosis in preoperative ureterorenoscopy and cytology positivity history (p>0.05). The IVR (+) group had significantly more previous history of bladder cancer (35.5% vs. 52.6%, p=0.019, respectively). While the number of patients with ureteral tumors was 10 (32.3%) in the IVR (-) group, it was 9 (47.4%) in the IVR (+) group, and it was significantly higher. There are 28 (56%) patients with T2-T4 pathology in the entire patient group, and the rate is significantly greater in the IVR (+) group (63.2% vs. 51.6%, p=0.038, respectively).

Conclusion: Caution should be exercised for metachronous bladder cancer recurrence in patients with a previous history of bladder cancer, especially in ureteral and high pathological T-stage UTUCs.

Keywords: upper urinary tract urothelial carcinoma, intravesical recurrence, risk factor, nephroureterectomy

The study was approved by University of Health Sciences, Bakırköy Dr.Sadi Konuk Training and Research Hospital Clinic Investigations Ethic Committee (Approval No: 2022-08-04, Date: 2022/04/18). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

INTRODUCTION

Upper tract urothelial carcinoma (UTUC) constitutes 5% of all urothelial carcinomas and 5-15% of renal tumors. (1, 2) UTUC is more progressive and prone to recurrence than bladder carcinomas. In addition, almost half of the tumors in these patients are invasive, and 19% of patients have metastases at the time of diagnosis. (3)

Due to multifocality, recurrence, and prognosis, the gold standard therapy at UTUC is radical nephroureterectomy (RNU) with bladder cuff excision. (4) The risk of bladder cancer after RNU is reported as 35-40% in the literature, which is quite high. (5, 6) In 82-89% of the patients, intravesical recurrence (IVR) is observed within 2 years. (6, 7)

It is important to know the factors predicting metachronous bladder recurrence due to progression, recurrence, and poor prognosis tendency. However, the development of IVR after RNU may depend on many variables, such as patient and tumor characteristics and the treatment modality. Male gender, preoperative chronic renal failure, positive urinary cytology, ureteral location, multifocality, pathological T stage, surgical margin positivity, and laparoscopic approach were identified as risk variables that increased IVR in a meta-analysis (8). In our study, we examined factors predicting metachronous recurrence of bladder cancer in our series of patients who underwent RNU for UTUC.

MATERIAL AND METHODS

The Ethics Committee approved our study of our institute. (Approval Number: 2022/126) Patients who underwent RNU due to UTUC in our center from 2009 to March 2020 were included in the study. Patients with pathology other than urothelial carcinoma, bilateral renal tumors at the time of diagnosis, nephrectomy of the contralateral kidney for UTUC, patients with metastatic disease at the time of diagnosis, receiving neoadjuvant chemotherapy or radiotherapy, patients with a history of cystectomy or undergoing simultaneous cystectomy were excluded from the study.

Patients were examined with preoperative routine blood and urine tests, contrast-enhanced + non-contrast-enhanced computed tomography (CT), or magnetic resonance imaging (MRI) urography. Evaluation of the lungs was made with thorax CT. All patients underwent preoperative cystoscopy for the presence of synchronized bladder tumors. Diagnostic ureterorenoscopy (URS) and/or biopsy were performed to confirm previous radiological findings in suspicious cases and when the surgical team prefers.

Patient characteristics such as age, gender, body mass index (BMI), Charlson Comorbidity Index (CCI), and tobacco use were recorded. Hemoglobin levels at the time of admission, degree of hydroureteronephrosis, history of preoperative URS, presence of previous bladder tumor and histopathological features, and, if available, history of intravesical therapy were scanned from the patient files. Tumor size, localization, RNU technique, lymph node (LN) dissection, perioperative complications, and postoperative histopathological results were recorded. Patients were classified as having and not having an IVR, and the factors predicting recurrence were evaluated.

In the postoperative period, the patients were followed up with physical examination, urinalysis, cytology, thorax radiography or CT, and axial abdominal imaging with and without contrast according to the renal failure status. They were followed up with cystoscopy every 3 months in the first year, then every 6 months for 2 years, and annually for the next 2 years, depending on the recurrence.

Surgical Technique

The open or laparoscopic decision was made based on the team's experience and patient-tumor characteristics. The main aim of applying the RNU procedure was to remove the gerota fascia, kidney, whole ureter, and bladder cuff. When LN involvement was detected on perioperative imaging or intraoperative palpable nodules, local LN dissection was undertaken. Laparoscopic RNU was performed with the four-trocar technique, open RNU with lumbotomy incision, and cuff excision with Gibson incision with extravesical technique.

Expert genitourinary pathologists evaluated specimens according to American Joint Committee on Cancer Classification 2010 and World Health Organization 2004 standards. Patients who had undergone surgery before the current guidelines were re-examined for

compliance with the histopathological standard. In renal pelvic cancers, the maximum tumor diameter was measured, and in ureter cancers, the entire length of the lesion along the long axis was measured. When there were multiple tumors in the ureter, the total lengths of the lesions along the long axis were calculated. When a tumor was found in both the renal pelvis and the ureter at the same time, it was classified as a renal pelvic or a ureteral tumor based on the location of the dominant tumor. The presence of two or more histologically confirmed tumors anywhere from the renal pelvis to the ureter was described as tumor multifocality.

Adjuvant platinum-based CT (two cycles of gemcitabine and cisplatin or methotrexate, vinblastine, doxorubicin, and cisplatin) was given to advanced-stage patients (muscle-invasive pathology or positive LN).

Patients were divided into two groups: with (+) and without (-) IVR, and patient, tumor, and surgical characteristics were compared. The categorical data were presented as numbers and percentages. Mean and Standard Deviation values were calculated for numerical data. Kolmogorov-Smirnov test was used to test the normal distribution of numerical data. The student's t-test was used to compare numerical data with normal distribution. Mann-Whitney U test was used to compare the mean of the non-normally distributed data. Frequencies of categorical variables were compared using Pearson Chi-square and Fisher's exact test. A p-value below 0.05 was considered statistically significant. Statistical analysis was performed using Statistical Package of Social Sciences version 21 (IBM SPSS Statistics; IBM Corp., Armonk, NY).

RESULTS

A total of 50 patients were included in the study. The mean age of the patients was 62.2 ± 12.2 years. Nine (18%) patients were female, and 41 (82%) were male. The mean BMI was calculated as 26.5 ± 4.1 kg/m2. IVR was developed in 19 (38%) of 50 patients, with a mean follow-up of 39.5 ± 25.3 months. The mean time to IVR was 13.8 ± 13.1 months. There was no significant difference between the two groups in terms of age, gender, BMI, tobacco use, CCI, hemoglobin level and glomerular filtration rate (GFR) at admission, and degree of hydronephrosis (p>0.05, Table 1).

Table 2 shows the patients› preoperative evaluations, perioperative characteristics, and postoperative histopathologic data. A total of 7 (14%) patients underwent diagnostic URS, 8 (16%) patients underwent URS with biopsy, and 7 (14%) patients had preoperative cytology positivity. When the two groups were compared, no significant difference was found regarding the history of preoperative URS and cytology positivity (p>0.05). The IVR (+) group had significantly more previous history of bladder cancer (35.5% vs. 52.6%, p=0.019, respectively). There was no significant difference between the two groups in terms of carcinoma in situ (CIS) and intravesical therapy before RNU (p>0.05).

When the location of the dominant tumor was examined, the renal pelvic tumor was detected in 21 (67.7%) patients in the IVR (-) group and 10 (52.6%) patients in the IVR (+) group. While the number of patients with ureteral tumors was 10 (32.3%) in the IVR (-) group, it was 9 (47.4%) in the IVR (+) group and was significantly higher than the other group. (p=0,04) In the entire patient group, the mean number of tumors was 1.06 ± 0.2, and the tumor size was 36.2 ± 15 mm, and there was no significant difference between the two groups (p>0.05).

35 (70%) patients underwent RNU with an open approach, and 15 (30%) patients with the laparoscopic technique. A total of 47 (94%) patients underwent cuff excision. Three patients could not undergo cuff excision for intraoperative reasons. Concerning surgical technique, there was no significant difference between the two groups. (p>0.05) When examining postoperative pathology, there were 15 (48.4%) patients with Ta-T1 pathology in the IVR (-) group and 7 (36.8%) in the IVR (+) group. There are 28 (56%) T2-T4 pathology patients in the entire patient group, and the rate is significantly greater in the IVR (+) group (63.2% vs. 51.6%, p=0.038, respectively). The high-grade tumor rate was 67.7% in the IVR (-) group, while it was 57.9% in the IVR (+) group, and there was no statistical difference between the groups (p>0.05). There was no statistically significant difference between the two groups in terms of intravesical treatment and adjuvant chemotherapy following RNU. (p>0.05)

Table 1: Demographic and preoperative datas

Parameters (mean ± SD)	***Total n=50***	***IVR (-) n= 31 (62)***	***IVR(+) n= 19 (38)***	***p***
Age (years)	62,2 ± 12,2	63 ± 12,7	61,1 ± 11,5	0,600
Gender (n ; %)				0,231
F	9 (18)	4 (12,9)	5 (26,3)	
M	41 (82)	27 (87,1)	14 (73,7)	
BMI (kg/m²)	26,5 ± 4,1	26 ± 3,7	27,2 ± 4,7	0,342
Smoking⁺	15 (30)	10 (32,2)	5 (26,3)	0,276[&]
Charlson Comorbidity Index				0,582
2	7 (14)	5 (16,1)	2 (10,5)	
3	7 (14)	2 (6,5)	5 (26,3)	
4	10 (20)	7 (22,6)	3 (15,8)	
5	11 (22)	6 (19,4)	5 (26,3)	
6	10 (22)	7 (22,6)	3 (15,8)	
7	1 (2)	1 (3,2)	0 (0)	
8	3 (6)	2 (6,5)	1 (5,3)	
9	1 (2)	1 (3,2)	0 (0)	
Hemoglobin levels at admission	12,8 ± 2,2	12,5 ± 2,4	13,2 ± 1,9	0,291
GFR levels at admission	76,2 ± 22,8	72,9 ± 19,7	81,5 ± 26,9	0,205
Hydronephrosis Grade				0,405
0	9 (18)	7 (22,6)	2 (10,5)	
1	9 (18)	6 (19,4)	3 (15,8)	
2	17 (34)	9 (29)	8 (42,1)	
3	14 (28)	8 (25,8)	6 (31,6)	
4	1 (2)	1 (3,2)	0 (0)	

[&] Mann-Whitney U Test +Presented as median (**IQR**)
IVR: Intravesical Recurrence, **GFR:** Glomerulation Filtration Rate, **BMI:** Body Mass Index

Table 2. The preoperative evaluations, perioperative characteristics, and postoperative histopathologic data of the patients

Parameters (mean ± SD)	***Total n=50***	***IVR (-) n= 31 (62)***	***IVR(+) n= 19 (38)***	***p***
Preoperative URS				0,850[!]
None	35 (70)	21 (67,8)	14 (73,7)	
Diagnostic	7 (14)	5 (16,1)	2 (10,5)	
URS + Biopsy	8 (16)	5 (16,1)	3 (15,8)	
Preoperative Cytology Positivity	7 (14)	5 (16,1)	2 (10,5)	0,142[!]
Previous History of Bladder Cancer	21 (42)	11 (35,5)	10 (52,6)	**0,019**
Presence of Concurrent Bladder Tumor	2 (4)	2 (6,5)	0 (0)	0,519[!]
History of preoperative intravesical CIS	2 (4)	0 (0)	2 (10,5)	0,140[!]
Preoperative Intravesical Treatment History	15 (30)	8 (25,8)	7 (36,8)	0,409

Tumor location				**0,04**
Pelvis	31 (62)	21 (67,7)	10 (52,6)	
Ureter	19 (38)	10 (32,3)	9 (47,4)	
Number of tumors in the Upper System	1,06 ± 0,2	1,06 ± 0,2	1,05 ± 0,2	0,867
Tumor Size	36,2 ± 15	37,2 ± 15,6	34,4 ± 14,3	0,532
Surgical Technique				0,372
Open RNU	35 (70)	23 (74,2)	12 (63,2)	
Laparoscopic RNU	15 (30)	8 (25,8)	7 (36,8)	
Cuff Excision	47 (94)	30 (96,8)	17 (89,5)	0,320
RNU specimen stage				**0,038**
Ta – T1	22 (44)	15 (48,4)	7 (36,8)	
T2 - T4	28 (56)	16 (51,6)	12 (63,2)	
CIS in RNU specimen	2 (4)	2 (6,5)	0 (0)	0,519[!]
Grade				0,349
Low Grade	18 (36)	10 (32,3)	8 (42,1)	
High Grade	32 (64)	21 (67,7)	11 (57,9)	
Adjuvant Intravesical Treatment History	2 (4)	0 (0)	2 (10,5)	0,140[!]
Adjuvant Chemotherapy	10 (20)	6 (19,4)	4 (21,1)	0,579[!]
Recurrence Time[+]	13,8 ± 13,1	N/U	13,8 ± 13,1	
Follow-up Time	39,5 ± 25,3	45 ± 27,9	30,6 ± 17,7	0,03

[!] Fisher Exact Test +Presented as median (**IQR**)
URS: ureterorenoscopy, **CIS**: carcinoma in situ, **RNU**: radical nephroureterectomy

DISCUSSION

In UTUC, the pathogenesis of tumor recurrence in the bladder after surgery remains a controversial issue. One of the main theories is that developing bladder tumors are implanted by a single transformed cell inseminated into the lumen (9), and another theory argues that pathology originates from a panureteral defect (10). However, data supporting a monoclonal and oligoclonal origin of metachronal multifocal urothelial carcinoma show that both mechanisms may be true (8).

Studies on intravesical treatments support implantation theory. (8) In a randomized controlled study, a single dose of mitomycin-C after RNU was found to cause an 11% reduction in the risk of IVR in the postoperative 12-month period (11). It has been reported that installing a single dose of pirarubicin reduces IVR (12). European Guidelines also support intravesical CT after RNU. (13) However, considering the potential side effects, including the risk of extravasation, it should be considered that such treatments are not innocent, and patient selection should be made meticulously. Therefore, it is critical to understand the IVR predictors to choose patients at high risk of IVR for local adjuvant therapies or to determine the frequency of protocols such as postoperative cystoscopic follow-up.

The risk of bladder cancer after RNU is 35-40% in the literature and is quite high. (5, 6) In our study, this rate was 38% in the mean follow-up period of 39.5 months. A higher rate of bladder cancer history was found in the group that developed IVR, and these patients were found to have a higher T-stage and a higher rate of ureteral localization with UTUC. In a meta-analysis by Seisen et al., it was shown that urothelial tumors were predictors of IVR compared to pelvic tumors (8). According to the same meta-analysis, other risk variables that increase IVR include male gender, positive preoperative urinary cytology, multifocality, pathological T stage, and laparoscopic approach.

Ureter tumors are thought to tend to spread to the

bladder because of their close anatomical location; this may be due to high urine flow and mechanical stress caused by intraluminal pressure (14). In the study by Yamashita et al., 83% of the patients had IVR within the first two years, and it was found that having a high-grade tumor was a significant risk factor (7). The authors argue that a rigorous surveillance protocol should be followed, especially in the first 2 years with a high-grade UTUC. They also reported that in the presence of a ureteral tumor, the length of the tumor is more important than the tumor's location in IVR. When they categorize ureter cancers based on the overall length, the total lesion length is 5 mm, and the IVR rate is 33%; when the total length is greater than 10 mm, the IVR rate increases to 55%. (7) However, meta-analysis supporting that ureteral tumors are predictors of IVR also showed that size was unrelated to IVR. (8) This suggests that the dominant mechanism for intraluminal transplantation in UTUC depends on the fragility of intercellular adhesions in invasive tumors. However, such differences may be due to inaccuracies in the length calculation, especially in ureter cancers (e.g., taking the longest tumor as the basis or taking the total tumor length when there are multiple tumors). When multiple tumors were detected in our study, we took the total tumor length as the basis and found no significant difference in tumor size between the two groups.

IVR may be detected more frequently in invasive tumors, according to studies demonstrating that the T stage of the RNU specimen may impact IVR (8, 15). In our study, T2-4 diseases were statistically significantly more frequently detected in the IVR (+) group. This situation forces us to plan more rigorous follow-up protocols and evaluate in favor of adjuvant intravesical treatment, especially in high-stage ureteric tumors.

In a study by Alothman et al., biopsy with preoperative URS, tumor multifocality, and a history of prior bladder cancer were risk factors in the patient series, with 40% intravesical recurrence over the median 18-month follow-up period. (5) Although our preoperative URS and tumor multifocality data did not support it, we determined that the history of previous bladder cancer was significantly higher in the group with IVR. The meta-analysis of Seisen et al. also supports that the previous bladder cancer history is an IVR predictor (8). The authors noted that this supported the theory that the lower and upper urothelial system's metachronous malignancies were created by transformed cells with distinct genetic alterations. Data suggesting that preoperative URS increases IVR (16, 17) support implantation theory due to transplantation after the ureteroscopic examination. A recent meta-analysis found that preoperative URS did not affect oncological outcomes in RNU patients but posed a risk for intravesical recurrence. (18) It has been suggested that URS should not be routinely used in diagnosis if the diagnosis made by imaging is relatively clear. (17) The data of our study do not support that history of preoperative URS is an important risk factor for IVR.

There was little difference in oncological outcomes between open and laparoscopic RNU for UTUC in two major multicenter studies of patients who received RNU for UTUC. (19, 20) However, there are also data showing that laparoscopic RNU is associated with worse oncologic outcomes than open (21). In the same study, no significant difference was found in IVR. In the literature, findings show that laparoscopic RNU is related to IVR, in addition to studies (5, 22) that show no difference in intravesical cancer recurrence between open and laparoscopic RNU (8, 23). In addition, the excision of the bladder cuff is important in UTUC surgery. (24) Even though the meta-analysis findings reveal inconsistent outcomes for endoscopic distal ureter excision, it demonstrates that the extravesical method is a predictor of IVR. (8) In our patients, we performed an open bladder cuff excision with Gibson incision with an extravesical technique in distal ureter treatment management. In our study, 47 (94%) of 50 patients received extravesical cuff excision, and cuff excision could not be completed in three patients due to intraoperative complications. Although there was no significant difference in IVR recurrence, we can assume this is due to the small number of patients without cuff excision.

The main limitation of our study is its retrospective design and the low number of patients. The inability to undertake multivariate analysis due to the small number of patients reduces the statistical power of our study. In addition, our case series consists of surgeries

that different surgical teams have performed for many years. Consequently, differences in surgeon experience, especially in laparoscopic technique, can disrupt the homogeneity of patient management between groups.

CONCLUSION

Caution should be exercised for metachronous recurrence of bladder cancer in patients with a previous history of bladder cancer, especially in ureteral and high pathological T-stage UTUCs. The increased risk of IVR requires rigorous follow-up of these patients and a compelling rationale for postoperative adjuvant therapy.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by University of Health Sciences Bakırköy Dr.Sadi Konuk Training and Research Hospital Clinic Investigations Ethic Committee (Approval No: 2022-08-04, Date 2022/04/18) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; TK, Data acquisition; ME, Data analysis and interpretation; TK, ME, Drafting the manuscript; TK, ME, Critical revision of the manuscript for scientific and factual content; TK, ME, Statistical analysis; ME, Supervision; TK, ME.

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Original Research / Özgün Araştırma

Does YouTube videos have reliable information on Penile Doppler Ultrasonography?

YouTube videoları Penil Doppler Ultrasonografi hakkında güvenilir bilgiye sahip mi?

Doğukan Sökmen[1], Bedriye Koyuncu Sökmen[2], Zülfü Sertkaya[1], Emin Taha Keskin[3]

1 Androexpertise Men's Health and Aesthetics Center, Department of Urology, Istanbul, Turkey
2 Acıbadem Mehmet Ali Aydınlar University, Atakent Hospital, Department of Radiology, Istanbul,Turkey
3 Başakşehir Çam and Sakura City Hospital, Department of Urology, Istanbul,Turkey

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Yazışma / Correspondence
Bedriye Koyuncu Sökmen
Atakent Hospital, Kayışdağı Cad. No:32
Ataşehir / Türkiye
E-mail: bedriyekoyuncu@yahoo.com
Tel: +90 505 714 83 55

ORCID

D.S.	0000-0001-8706-5357
B.K.S.	0000-0002-1470-803X
Z.S.	0000-0002-6501-5962
E.T.K.	0000-0002-1222-6424

Özet

Amaç: Amacımız, erektil disfonksiyon (ED) tanısında kullanılan penil doppler ultrasonografi (PDU) ile ilgili YouTube videolarının doğruluğunu ve güvenilirliğini değerlendirmektir.

Gereç ve Yöntemler:"Penile Doppler Ultrasonografi" ifadesi kullanılarak YouTube üzerindeki videolar araştırıldı. PDU ile alakalı en popüler 48 video çalışmaya dahil edildi. Videoların kim tarafından yayınlandığı (doktor, hasta veya YouTuber), hedef kitle (doktorlara veya hastalara), video süresi, yüklenme tarihi, günlük izlenme sayısı, toplam izlenme sayısı, beğeni ve yorum sayısı kaydedildi. Çalışmaya dahil edilen bu videoların içeriğinin güvenilirliği ve kalitesi ise JAMA, DISCERN ve GQS skorları kullanılarak değerlendirdi.

Bulgular: Çalışmaya dahil edilen videoların tümünün doktorlar tarafından yüklendiği görüldü. Videoların 27 (%56) sının doktorlar için, kalan videoların ise doktor dışı izleyiciler için hazırlandığı saptandı. Tüm videoların PDU hakkında genel bilgi içerdiği, 32 (%67) videoda teorik bilgi, 23 (%48) videoda ise PDU uygulanışı ile ilgili bilgi verildiği görüldü. Hedef kitleye göre videolar incelendiğinde doktorlar için hazırlanan videoların süresinin daha uzun olduğu (p=,001) ancak yorum ve izlenme sayısının daha az olduğu gösterildi (sırasıyla p=,012 ve p=.046). Ayrıca video içerik kalitesi ve güvenilirliği incelendiğinde ortalama JAMA skoru 2,5, GQS skoru 3,44 ve DISCERN skoru ise 52,2 olarak hesaplanmış olup doktorlar için hazırlanan videolarda kalite ve güvenilirliğin istatistiksel olarak daha yüksek oluğu saptandı (p<0,05).

Sonuç: Sağlık hizmetleriyle ilgili bir bilgi kaynağı olarak YouTube, doktorlar ve diğer insanlar

Abstract

Objective: Our objective was to evaluate the accuracy and reliability of YouTube videos about penile doppler ultrasonography (PDU), a diagnostic tool for erectile dysfunction.

Material and Methods: Videos on YouTube were searched using the term "Penile Doppler Ultrasonography". The most related 48 videos were included in to study. For each video, uploader type (physician, patient, or YouTuber), target group (physicians or non-physicians), video duration, upload date, daily view count, the total number of views, and the number of likes and comments were recorded. The reliability and quality of the content of these videos included in the study were evaluated using JAMA, DISCERN, and GQS scores.

Results: The physicians uploaded all of the videos used in the study. It was shown that 27 (56%) of the videos were prepared for physicians, and the remaining videos were prepared for non-physicians. All the videos had general information about the PDU, 32 (67%) videos gave theoretical information, and 23 (48%) videos gave information about the application of the PDU. When the videos were examined according to the target group, it was shown that the videos prepared for physicians had a longer duration (p=,001) but had a lower number of comments and views (p=,012 and p=.046, respectively). In addition, when the video content quality and reliability were examined, the average JAMA score was 2.5, the GQS score was 3.44, and the DISCERN score was 52.2. It was found that the quality and reliability scores were statistically higher in the videos prepared for physicians (p<0.05).

Conclusion: As a source of knowledge about health care, YouTube is frequently used by doc-

All research was performed in accordance with relevant guidelines/regulations.

(hastalar dahil) tarafından sıklıkla kullanılmaktadır. Yüksek kaliteli bilgi hem doktorlar hem de hastalar için çok önemlidir. Bu çalışmada doktorlar tarafından yüklenen videoların daha güvenilir içeriğe sahip olduğunu ancak bu yüksek kaliteli videoların daha uzun süreli ve daha düşük izlenme sayısına sahip olduğunu gösterdik. PDU ile ilgili videoların kalitesinin yükselmesi hekimlerin yüksek kaliteli videolar üretmesi ve YouTube algoritmasının ise hastaları bu yüksek kaliteli videolara yönlendirmesi ile olabileceğine inanmaktayız.

Anahtar Kelimeler: penil, doppler, ultrasonografi, youtube

tors and other people (including patients). High-quality information is very important for both physicians and individual patients. In this study, we showed that videos uploaded by physicians had reliable content, but these high-quality videos had longer duration and lower view count. In order to improve the quality of PDU-related videos, physicians should upload high-quality videos, and YouTube algorithms should direct patients to high-quality videos.

Keywords: penile, doppler, ultrasonography, YouTube

INTRODUCTION

Social media is becoming increasingly essential in the field of health care. Many people turn to these online tools for information about their medical issues because there is an increasing amount of easily accessible medical information on social media (1). Although there is a great deal of public interest in andrological issues, the information now accessible in this area has not been fully analyzed (2). According to Sansone et al.'s research on the subject, therapy alternatives for sexual dysfunction are regularly discussed on Twitter (3).

Erectile dysfunction (ED) is the chronic inability to obtain and sustain an erection strong enough to allow for acceptable sexual performance. The pathophysiology of ED may be vasculogenic, neurogenic, anatomical, hormonal, drug-induced and/or psychogenic. ED can have a vasculogenic, neurogenic, anatomical, hormonal, drug-induced, or psychogenic etiology. Most ED patients' medical and sexual histories can be used to make a diagnosis; however, certain patients might require particular diagnostic tests (4). A diagnostic procedure known as penile doppler ultrasound (PDU) is used to examine the haemodynamic pathophysiology of ED. Consequently, it is typically used in clinical practice in situations where there is a chance that ED has a vasculogenic cause. Doppler Ultrasonography is important in the diagnosis of hemodynamic parameters such as PSV, end-diastolic velocity (EDV), and the resistance index (RI) as diagnostic criteria (5).

Only a few studies on the accuracy of the information in social media and YouTube videos have been conducted on ED and its diagnosis with PDU. Our study aims to rate the accuracy and reliability of PDU-related information in YouTube videos.

MATERIAL AND METHODS

Videos on YouTube were searched using the term "Penile Doppler Ultrasonography". The study excluded videos that were not in English and videos that kept repeating. After the exclusion, the most related 48 videos were included to study for statistical analysis. Since neither humans nor animals were included in our study and the recordings were available to the general public, no ethics committee permission was necessary.

While determining the target groups of the videos, YouTube videos were divided into two groups. Scientific meeting videos, physician training, information videos, and universities' professional educational videos were included in the physician group. Informative videos for patients and others were included in the non-physician group.

For each video, uploader type (physician, patient, or YouTuber), target group (physicians or non-physicians), duration length, view count, like, and comment counts were recorded. The videos' daily views were counted (calculated as follows: daily views = total views x (reviewing date x uploading date)) and recorded. Using JAMA, DISCERN, and GQS scores, the reliability, and quality of the content of these videos included in the study were assessed.

One of the quality analysis scales is the Global Quality Scale (GQS) used for all kinds of videos. A 5-point scale (1–5) is used to determine the video's usefulness and quality for GQS. According to this scale, 1 or 2 points indicate low quality, 3 point indicates medium, and 4 or 5 points indicate high-quality videos (6).

We also utilized the Quality Criteria for Consumer Health Information (DISCERN) scale to assess data accuracy on transdermal TT. The DISCERN scale, which comprises 15 questions, is used to assess the quality of

health-related information. Each question is scored 1 to 5 points. Question numbers 1-8 are used to evaluate reliability, question numbers 9-15 are used to evaluate treatment choice quality, and question 16 is used to evaluate the general quality of the video information. According to the DISCERN scores, videos are grouped as <28 points as very poor, 28–38 points as poor, 39–50 points as average, 51–62 points: as good, and 63–75 points: as excellent quality videos (7).

JAMA (Journal of the American Medical Association) benchmark criteria are another scoring system used to evaluate the quality of internet information. Four criteria include authorship (authors with their affiliations and relevant credentials), attribution (all copyright information noted, references for all content are listed clearly), disclosure (video ownership, conflicts of interest, funding, and advertising are disclosed), and currency (posted and updated dates as indicated) are used. Each criterion has 1 point, and the maximum score is 4 (8).

This study's data analysis was performed using the SPSS 22.0 (Statistical-Package-for-Social-Sciences, IBM Inc, USA) application. Results were recorded as a minimum - maximum, mean - median, standard deviation - IQR values for continuous variables. Categorical variables were recorded as percentages and numbers. The Kolmogorov-Smirnov (KS) test was used to analyze whether the variables were normally distributed or not. Duration (p=,001), daily view ratio(p=,008), number of views(p=,001), number of comments(p=,001), and number of likes (p=,001) were found not normally distributed using the KS test. Mann-Whitney U test was used for not normally distributed these variables. JAMA, GQS, and DISCERN scores (Total, reliability, treatment choice, and quality) were normally distributed using the KS test. For these variables, the independent samples T-test was used for analysis. The Pearson correlation test was performed in order to perform correlation analysis. A value of $p < 0.05$ was considered statistically significant.

RESULTS

Forty-eight videos were used for statistical analysis. Table 1 shows the various characteristics of the videos. The physicians uploaded all of the videos used in the study. According to the target group, it was shown that 27 (56%) of the videos were prepared for physicians, and the remaining videos were prepared for non-physicians. The video content review showed that all videos had general information about the PDU, 32 (67%) videos had theoretical information, and 23 (48%) videos had information about the application of the PDU.

Table 1. Characteristics of the YouTube videos

		YouTube Videos n (%)
		48 (100)
Target group		
Physicians		27 (56)
Non-physicians		21 (44)
Content		
General information		48 (100)
Theoretical information		32 (67)
Practical information		23 (48)
	Median (IQR)	**Min - Max**
Duration (min.)	8 (18)	0,47 – 64,07
Daily view ratio	15,4 (35,8)	1,1 - 156
Number of views	7 570 (28 758)	339 – 120 215
Number of likes	106 (167)	6 – 1932
Number of comments	13 (51)	0 - 382

min.: minutes

When the videos were examined according to the target group, it was shown that the videos prepared for physicians had a longer duration (p=.001), but had a lower number of views and comments (p=.046 and p=.012, respectively). The daily view ratio and the number of likes were not different between groups (p=.094 and p=.399, respectively) (Table 2).

In addition, when the video content quality and reliability were examined, the average JAMA score, GQS score, and the total DISCERN score were calculated 2.5, 3.44, and 52.2, respectively. It was found that all types of quality and reliability scores were statistically higher in the videos prepared for the physicians' group than in the non-physician group (p<0.05) (Table 3).

Table 2. Video Characteristics by target group

	Physicians n (%)	**Non-physicians n (%)**	
	27 (56)	21 (44)	
	Median (IQR)	**Median (IQR)**	**p value**
Duration (min.)	12 (51)	6 (6)	0.001*
Daily view ratio	15.4 (14.3)	23.1 (81)	0.094*
Number of views	5 862 (28 800)	10 083 (30 611)	0.046*
Number of comments	10 (18)	58 (262)	0.012*
Number of likes	67 (189)	145 (529)	0.399*

min.: minutes
*: Mann-Withney U

Table 3. JAMA, GQS and DISCERN scores by target group

	Total n (%)	**Physicians n (%)**	**Non- physicians n (%)**	
	48 (100)	27 (56)	21 (44)	
	Mean ± Std	**Mean ± Std**	**Mean ± Std**	**p value**
JAMA	2.5 ± 0.8	3.13 ± 0.8	1.88 ± 0.3	0.002*
GQS	3.4 ± 1.1	4.25 ± 1	2.63 ±0.5	0.003*
DISCERN				
Reliability	26.3 ± 7.7	32,6 ± 4.3	20.6 ± 5	0.001*
Treatment choice	22.5 ± 6.3	26.8 ± 5.7	18.1 ± 2.9	0.002*
Quality	3.1 ± 0.7	3.63 ± 0.5	2.63 ± 0.5	0.003*
Total	52.2 ± 14.4	63.1 ± 10.4	41.3 ± 8.1	0.001*

JAMA: Journal of the American Medical Association Criterias Score
GQS: Global Quality Scale Score,
DISCERN: Quality Criteria for Consumer Health Information Score,
*: Independent samples T test

DISCUSSION

People are accessing social media, especially YouTube, more frequently to find information about their health. Men's health issues are especially important because some people may be reluctant to discuss them with their healthcare provider. Before visiting a urologist, males with sexual symptoms can be more likely to use the internet (9). Although ED is a frequent men's health issue, most studies on YouTube and men's health have focused on prostate cancer. There was little research examining the accuracy or dependability of videos connected to ED, and there was little investigation into the accuracy of ED diagnoses like PDU. This study is the first to show whether there is a piece of reliable information on YouTube about PDU. We aimed to examine the quality and reliability of PDU-related videos on YouTube.

Anyone easily uploads every kind of health-related content on YouTube uncontrolled, cost-free, and unaudited manner. According to research by Warren et al., most YouTube content directly connected to men's health is unreliable, and reliable videos are not seen more frequently than unreliable ones (10). Similarly, in this study, it was seen that videos with low-quality content had higher viewing rates.

In general, previous studies have shown that who produced the videos affects video quality and reliability. According to Ovenden et al., videos submitted by doctors received considerably better DISCERN and JAMA scores than videos uploaded by non-physicians (11). In this study, all videos included are uploaded by physicians because PDU is a piece of technical information, not general information. For this reason, we could not examine the effect of who uploaded it on video quality.

Instead of the video uploader type, the videos were divided into 2 groups in this study according to the target group, physicians and non-physicians. It has been shown that the videos prepared for physicians have higher GQS, DISCERN, and JAMA scores, and the quality of the video content is higher than the non-physicians group. It was determined that the content quality of the videos produced for physicians was higher since they were videos about scientific meetings, training meetings, or how the PDU procedure was performed. Similarly, videos prepared for the non-physician group were found to have lower content quality since they had more general information and did not contain sufficient scientific information.

There are numerous videos that include misinformation and get many views. More views do not necessarily indicate that the content is more well-liked and accurate, as Salman et al. Similar to other studies, the number of views was shown to be inversely proportional to the DISCERN score. Many articles showed that a worse DISCERN score was actually associated with more views (12). Similarly, in this study, we found that although the GQS, JAMA, and DISCERN scores of the videos prepared for physicians were higher, the total number of views was lower.

Ozsoy-Unubol et al. showed that more video duration is associated with more high-quality videos. We also found that the duration minutes of the videos were positively correlated with the DISCERN, GQS, and JAMA scores similarly ($p<0.001$). The videos prepared for physicians were much longer duration than other videos. Since the videos prepared for physicians have to content such as scientific meetings and PDU practice training, they are thought to have longer video durations because they may contain technical and practical information apart from general information (13).

Some ways to propose solutions to this problem are considered in the literature. First, rules governing the use of social media for patient education must be established by the European Association of Urology, American Urological Association, and British Journal of Urology International (14).

Second, Warren et al. recommended that physicians and medical organizations keep posting high-quality videos while working to improve their views by adhering to recommendations included in the YouTube Creator Academies (15). Third, the YouTube algorithm should direct patients to high-quality videos, especially on health-related topics (16).

CONCLUSION

Patients and others (such as doctors and students) use YouTube as a resource for health information, yet the majority of the videos that are seen are unreliable. The importance of PDU's accurate information neces-

sitates uploading high-definition videos that are the ideal length. High-quality information is very important for both public health and also physicians. This study showed that videos prepared for physicians are reliable content. To raise the standard of health-related videos, it is important that physicians should upload high-quality, reliable videos, and YouTube algorithms should direct the patients to high-quality videos.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Ethical Approval

The design of the study does not require ethical committee approval. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; DS, BKS, ZS, ETK, Data acquisition; DS, BKS, Data analysis and interpretation; DS, BKS, ZS, Drafting the manuscript; DS, BKS, ZS, ETK, Critical revision of the manuscript for scientific and factual content; DS, BKS, ZS, ETK, Statistical analysis; ZS, ETK, Supervision; DS, ZS, ETK.

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Original Research / Özgün Araştırma

Methylene blue-guided retroperitoneoscopy technique: alternative for percutaneous nephrolithotomy in cases with renal access failure

Metilen mavisi retroperitonoskopi tekniği: renal akses sağlanamayan perkütan nefrolitotomi vakalarında alternatif

Serdar Karadağ, Mithat Ekşi

University of Health Sciences, Bakırköy Dr. Sadi Konuk Training and Research Hospital, Department of Urology, Istanbul, Turkey

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Yazışma / Correspondence
Mithat Ekşi
Zuhuratbaba, Dr. Tevfik Sağlam Cd
No:11, Bakırköy Dr.Sadi Konuk Hospital,
Department of Urology,
34147, İstanbul / Türkiye
E-mail: mithat_eksi@hotmail.com
Tel: +90 506 252 82 83

ORCID
S.K. 0000-0002-1420-4536
M.E. 0000-0003-1490-3756

Özet

Amaç: Perkütan Nefrolitotomi cerrahisinde (PNL) çeşitli sebeplerle ekstravazasyon gelişen ve neticesinde komplike olan vakalarda uyguladığımız 'Metilen Mavisi Eşliğinde Retroperitonoskopi Tekniği"ni sunmak.

Gereç ve Yöntemler: 2014-2020 yılları arasında Bakırköy Dr. Sadi Konuk SUAM'da 'Metilen Mavisi Tekniği' uygulanarak yapılan 36 PNL vakası retrospektif olarak değerlendirildi. Renal skar ya da tüm kaliksi dolduran staghorn kalkül sebebiyle Amplatz kılıfının ilerletilemediği, Amplatz kılıfın yardımcı ekip tarafından dikkatsizlik sonucunda rehber tel ile birlikte çekildiği ve ekstravazasyon gelişen durumlarda "Metilen Mavisi" yöntemi kullanılan olgular çalışmaya dahil edildi. Hastalara ait demografik, preoperatif, perioperatif ve postoperatif verileri kaydedildi, taşsızlık ve komplikasyon oranları belirtildi**.**

Bulgular: Hastaların ortalama yaşı 45,1 yıl (36-55), ortalama vücut kitle indeksi 27,8 ± 4 kg/m2, ortalama taş boyutu 3,4 ± 0,7 cm, taş volümü 22,3 ± 10,2 cm3 idi. Ortalama operasyon süresi 95,8 ± 30,3 dk olarak hesaplandı. Postoperatif 1. gün taşsızlık oranı %68, 3. Ayda %75 idi. 8 hastaya (%22,2) ikincil bir prosedür uygulandı (ekstrakorporeal şok dalga litotripsi (ESWL) veya fleksible üreterorenoskopi (F-URS)).

Sonuç: Uyguladığımız 'Metilen mavisi tekniği' retroperitonoskopik direkt görüş altında daha önce kısmen veya tamamen dilatasyon sağlananan kaliksi bularak böbreğe tekrar akses sağlanması için güvenli ve pratik bir seçenektir.

Anahtar Kelimeler: metilen mavisi, retroperitonoskopi, renal akses başarısızlığı, perkütan nefrolitotomi

Abstract

Objective: To present our 'methylene blue-guided retroperitoneoscopy technique' that we apply in cases where extravasation develops for various reasons and is complicated as a result in Percutaneous Nephrolithotomy surgery (PNL).

Material and Methods: A total of 36 patients, who underwent PNL with the 'methylene blue technique' at Bakirkoy Dr. Sadi Konuk Training and Research Hospital between 2014 and 2020, were retrospectively evaluated. The study included only cases in which the 'methylene blue-guided retroperitoneoscopy technique' was used due to the inability to advance the Amplatz sheath to the targeted calyx due to renal scarring or a staghorn stone filling the targeted calyx, Amplatz sheath was withdrawn from the kidney with the guidewire due to the inattention of the assistant surgical team or contrast material extravasation. The patients' demographic, preoperative, perioperative, and postoperative data were recorded, and stone-free and complication rates were noted.

Results: The mean age of the patients was 45.1 (36-55) years, the mean body mass index was 27.8±4 kg/m2, the mean stone size was 3.4±0.7 cm, and the mean stone volume was 22.3±10.2 cm3. The mean operation time was calculated as 95.8±30.3 minutes. The stone-free rate was 68% on the postoperative first day and 75% on the third month. Eight patients (22.2%) underwent a secondary procedure (extracorporeal shock wave lithotripsy or flexible ureterorenoscopy).

Conclusion: The 'methylene blue-guided retroperitoneoscopy technique' we apply under retroperitoneoscopic direct vision is a safe and practical option for re-accessing the kidney by locating the calyx, which is first partially or completely dilated.

Keywords: methylene blue, retroperitoneoscopy, renal access failure, percutaneous nephrolithotomy

The study was approved by University of Health Sciences, Bakırköy Dr.Sadi Konuk Training and Research Hospital Clinic Investigations Ethic Committee (Approval No: 2021-11-22, Date: 2021/11/15). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

INTRODUCTION

Percutaneous nephrolithotomy (PNL) is the primary and effective treatment method for kidney stones larger than 2 cm and lower calyceal stones over 1 cm that are unsuitable for extracorporeal shock wave lithotripsy (1). The three important stages of this operation are renal access, dilatation, and fragmentation. Failure to provide access to the targeted calyx, insufficient dilatation, Amplatz sheath being outside the kidney, and complications that may occur secondary to these significantly affect postoperative outcomes. Especially in patients with staghorn stones filling the targeted calyceal system and those with scarring secondary to previous kidney surgery, adequate dilatation may not be achieved even if calyceal access is provided (2).

Sometimes when the kidney is mobile, and the parenchyma is thin, and sometimes, due to the imprecision of the assistant surgical team, the Amplatz sheath may be withdrawn from the kidney together with the guidewire. In these cases, image quality deteriorates due to bleeding and contrast agent extraction, making it difficult to access the targeted calyx again. Although various alternative methods, such as ultrasonography (USG), endoscopy-assisted access, and an angio-catheter, have been proposed to achieve re-accession in such cases, there is still no consensus on the standard approach (2,3).

In this study, we aimed to present our experience with our previously undefined 'methylene blue-guided retroperitoneoscopy technique', which we applied in 36 PNL cases to provide access to the kidney where the Amplatz sheath could not be advanced to the targeted calyx due to the reasons as mentioned above, and all alternative access methods were also unsuccessful.

MATERIAL AND METHODS

Patients who underwent PNL due to kidney stones at Bakirkoy Dr. Sadi Konuk Training and Research Hospital between 2014 and 2020 were retrospectively evaluated. We recorded the data of 36 cases in which we applied the 'methylene blue-guided retroperitoneoscopy technique', previously undefined in the literature, due to the inability to obtain perioperative access.

Among the patients aged 18 years and older, patients did not require intensive care follow-up. The study included only cases in which the 'methylene blue-guided retroperitoneoscopy technique' was used due to the inability to advance the Amplatz sheath to the targeted calyx due to renal scarring or a staghorn stone filling the targeted calyx, Amplatz sheath was withdrawn from the kidney with the guidewire due to the inattention of the assistant surgical team or contrast material extravasation, in which re-access was achieved using the 'methylene blue-guided retroperitoneoscopy technique'.

Routine laboratory tests were performed on all the patients preoperatively. The sterility of the preoperative urine culture was ensured in the patients, and a contrast-enhanced examination [computer tomography (CT) or intravenous pyelography] was undertaken. The stone size was defined as the longest axis of the stone. Stone volume was estimated using the ellipsoid formula the European Association of Urology recommended ($SV=\pi*l*w*d*0.167$), where length, width, and depth constitute stone diameters measured in three axes (4). In the case of multiple stones, the dimensions of each stone were measured separately and then added.

Parameters such as stone localization, presence of anomalies, and partial or complete staghorn stones were used to calculate Guy's stone score (GSS) (5). Operative time was defined as the time from entering the external urethral meatus to inserting the ureteral catheter to inserting the nephrostomy tube. Complications were evaluated according to the modified Clavien score (6). Fever was defined as a body temperature of >38 °C. Bleeding was defined based on the requirement of blood transfusion, bladder irrigation, or hospitalization.

Direct urinary system radiography was performed on the first postoperative day, and CT was performed on the third month. A residual stone fragment size of <4 mm was considered stone-free.

Surgical Technique

In all cases, a standard retrograde 5-French ureteral exchange catheter was placed in the renal pelvis in the lithotomy position. Then, fluoroscopic access was attempted by placing the patient in a prone position. Gradual dilatation was performed with a plastic dilator set. A 24-French nephroscope (Karl Storz GmbH & Co. KG, Tuttlingen, Germany) and a pneumatic lithotripter (Vibrolith®, Elmed, Ankara, Turkey) were used in all cases.

After imaging the calyceal system by injecting contrast material through the retrograde ureteral catheter and entering the targeted calyx with an 18-gauge needle, during the attempt to advance the coaxial guidewire to the renal pelvis, upper calyx, or ureter, the catheter can only be advanced to the targeted calyx in some cases due to the presence of a stone filling the calyx or insufficient hydronephrosis. Although gradual dilatation is performed with a plastic dilator set over the coaxial guidewire and the Amplatz sheath is placed, this sheath may remain at the parenchymal border or outside the kidney. Access may not be provided in cases where the stone has filled the targeted calyx, the coaxial guidewire cannot carry the dilator, the Amplatz sheath cannot be advanced to the calyx due to scarring secondary to previous kidney surgery, and in the presence of a mobile kidney and thin parenchyma. In addition, due to the imprecision of the assistant surgical team, the inserted Amplatz sheath may be withdrawn from the kidney together with the coaxial guidewire. There may also be some cases in which the Amplatz sheath is initially thought to be in the calyx, but when the nephroscope is entered, this sheath is visualized to have been left in the retroperitoneal space. Extravasation from the parenchymal defect is achieved by administering methylene blue diluted with 0.9% saline at 1/10 through the ureteral catheter with a slow and continuous flow. Under direct view of the nephroscope located in the retroperitoneum, a renal parenchymal defect is sought around the blue area. After the opening in the renal parenchyma is located, if it is wide enough for the nephroscope to enter, the nephroscope is directly entered into the calyx. Then, the Amplatz sheath is advanced to the calyceal system over the nephroscope. Suppose the opening in the parenchyma is not wide enough for the nephroscope to pass through. In that case, the coaxial guidewire is sent into the system through this opening, and access is provided by re-dilating it (Figure). During retroperitoneoscopy, vascular structures in the perirenal region can be seen with direct examination. In addition, during Retroperitoneoscopy, the advanced level of the nephroscope should be intermittently checked with fluoroscopy to avoid possible trauma to the renal pedicular structures. A drainage catheter can be used in cases where the retroperitoneoscopy procedure takes a long time, and there is reluctance due to the extravasation of fluid in the retroperitoneal area.

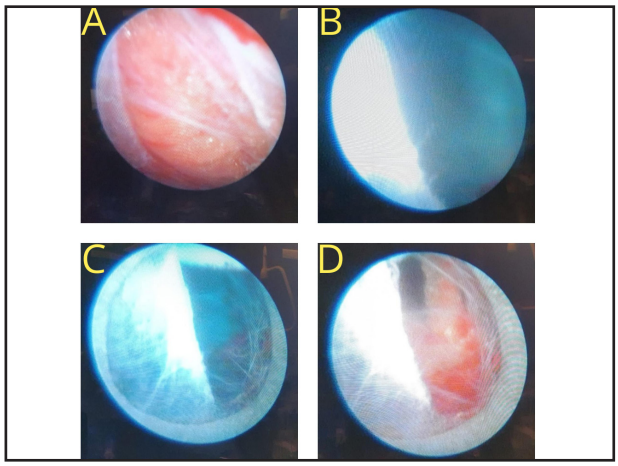

Figure: A. Retroperitonescopic view. B. Orientation towards the region where methylene blue comes from. C. Locating the calyx orifice. D. The appearance of the calyx after the end of the methylene blue infusion.

RESULTS

The mean age of the patients was 45.1 ± 4.8 years, and their mean body mass index was 27.8 ± 4 kg/m2. Ten patients (27.7%) had a previous history of stone surgery on the same side. The mean stone size was calculated as 3.4 ± 0.7 cm, and the mean stone volume was 22.3 ± 10.2 cm3. Nineteen (52.8%) procedures were performed on the right side and 17 (47.2%) on the left side. Table 1 presents the patients' demographic data, including the degree of stone-related hydronephrosis and the distribution of GSS values.

The mean operative time was calculated as 95.8 ± 30.3 minutes. A perioperative double-J stent was placed in 16 (44.4%) patients. The stone-free rate was 68% on the postoperative first day and 75% on the third month. Kidney access could not be achieved in one case, and the operation was left to the second session. Eight patients (22.2%) underwent a secondary procedure (Table 2). In the early postoperative period, fever was observed in two (5.5%) patients, transient creatinine elevation in two (5.5%), blood transfusion in one (2.7%), and urinary system infection in one (2.7%). A double-J stent was inserted in one (2.7%) patient due to a urinary system leak. No Clavien Grade 3b, 4, or 5 complications were observed in our patients. Data on complications are shown in Table 3.

Table 1. Demographic data of the patients

Parameters	**Mean ± SD**
Age (years)	45.1 ± 4.8
BMI (kg/m2)	27.8 ± 4
ASA (n; %)	
1	5 (13.8)
2	25 (69.4)
3	6 (16.6)
Previous Surgery (n; %)	**10 (27.7)**
Side (n; %)	
Right	**19 (52.7)**
Left	**17 (47.2)**
Hydronephrosis (n % %)	
0	**8 (22.2)**
1	**11 (30.5)**
2	**10 (27.7)**
3	**5 (13.8)**
4	**2 (5.5)**
Guy's Stone Score (n ; %)	
1	**7 (19.4)**
2	**10 (27.7)**
3	**12 (33.3)**
4	7 (19.4)
Stone Diameter (cm)	3.4 ± 0.7
Stone Volume (cm3)	22.3 ± 10.2

SD: standard deviation, **BMI:** body mass index, **ASA:** American Society of Anesthesiologists

Table 2. Perioperative and postoperative data

Parameters	**Mean ± SD**
Reason to Perform (n ; %)	
Renal scarring	10 (27.7)
Staghorn stone filling the targeted calyx	20 (55,5)
Imprecision of the assistant surgical team	2 (5.5)
Massive contrast material extravasation	4 (11.1)
Operative Time (min)	95.8 ± 30.3
Double-J Stent Placement (n; %)	16 (44.4)
Additional Procedure (n; %)	
SWL	6 (16.6)
RIRS	2 (5.5)
SFR (n; %)	
First day	68
Third month	75
Length of Stay (day)	3 ± 1.6

SD: standard deviation, **SWL:** shock wave lithotripsy, **RIRS:** retrograde intrarenal surgery, **SFR:** stone-free rate

Table 3. Complications according to the Clavien-Dindo classification

	n (%)
Grade 1	
Fever	2 (5.5)
Temporary elevation in creatinine	2 (5.5)
Grade 2	
Blood transfusion requirement	1 (2.7)
Urinary system infection	1 (2.7)
Grade 3a	
Double-J stent requirement >24 h	1 (2.7)

DISCUSSION

It has been reported that appropriate patient selection, sufficient surgical experience, and adequate equipment are required to perform PNL surgery (7) successfully. Renal access, dilatation, and fragmentation are the three important stages of this operation. The safety and success of surgery are affected by the structure of the calyx planned to be accessed (8).

Despite the increase in surgical experience and technological developments, many complications are still encountered in PNL operations, and most of these complications are seen during the preoperative dilatation stage. The immediate identification of complications and early intervention plays an important role in this process (9).

In the literature, the inability to achieve access during PNL has been reported at 2% among urologists and 9% among radiology doctors (10).

The reasons for this access failure have been listed as insufficient dilatation, the stone filling the targeted calyx, the guidewire not carrying the dilator, the Amplatz sheath not advancing to the calyx due to scarring secondary to previous kidney surgery, presence of a mobile kidney and thin parenchyma, the Amplatz sheath being withdrawn from the kidney together with the guidewire due to the imprecision of the assistant surgical team. and the Amplatz sheath being mistakenly considered to be inside the kidney when it is actually outside the kidney as confirmed under a nephroscope (11).

Extravasation due to the lack of access is undesirable, but extravasation that obscures the fluoroscopy area is extremely rare. When severe extravasation occurs, fluoroscopy-guided puncture becomes very difficult and impossible. Even if the puncture is performed, the dilatation phase becomes open to complications due to the incomplete understanding of the calyceal anatomy due to extravasation. Various alternative methods have been proposed to provide access in such cases, e.g., furosemide injection, use of more concentrated contrast material, air pyelogram, and USG-assisted access (11). Khan et al. (12) and Grasso et al. recommended endoscopy-assisted access (13), while Giannakopoulos et al. suggested that an angiographic catheter could be used for this purpose (3).

Khan et al. (12) provided percutaneous access to 12 patients with flexible urethroscopy and emphasized that the ureteroscope facilitated access since it stabilized the kidney. Two of the 12 patients required a second surgical procedure, and the operation was terminated in one of these patients due to intraoperative bleeding. In another patient, additional surgery with urethroscopy was required due to a 12-mm stone in the anterior calyx, which could not be reached using the nephroscope.

Grasso et al. (13) also presented their series of seven cases in which they provided percutaneous access under flexible urethroscopy. One of their seven patients had a severe perirenal hematoma after a previous attempt to perform a nephrostomy. The authors stated that they applied this method because three patients had anterior calyceal stones, and dilatation was not possible in a further three cases due to staghorn stones. In all cases, they reported that percutaneous access was

performed in <30 minutes.

Giannakopoulos et al. (3), sharing their seven-year PNL experience, reported that fluoroscopic percutaneous access could be achieved using an angiographic catheter after an unsuccessful puncture in four patients. They stated that extravasation occurred due to high pressure after manual contrast injection into the pelvicalyceal system in two of these four patients and following more than one unsuccessful calyx puncture in the remaining two patients. They achieved successful access in all patients with the method they described.

Our study showed that re-entry into the targeted calyx was possible with the 'methylene blue-guided retroperitoneoscopy technique', which we defined and used after an unsuccessful access attempt. Due to extravasation, the stone-free rate decreases following difficulties in reaching the stone when entering a distinct calyx other than the targeted calyx. Our method provided access to the targeted calyx and positively affected the operation's success. With this method, which we explained in detail in the surgical technique section, we achieved easy re-entry into the targeted calyx in 35 of the 36 patients. Thus we obtained a stone-free rate similar to the literature. A study by He et al. defined a method to be protected from x-ray effects by integrating a punched frame into the ultrasound probe. In this method, access was verified by giving methylene blue from the ureteral catheter after access was provided. A puncture frame is effective and safe and reduces the complication rates while providing ultrasound-guided renal access in percutaneous nephrolithotomy (14).

Generally, an unsuccessful operation is distressing for both the patient and the surgeon (15). Furthermore, having to receive anesthesia for the second time for the operation and related psychological effects result in a very difficult process for the patient. If possible, completing the operation in a single session is more appropriate to avoid these unfavorable situations (16,17).

The perioperative and postoperative early complication rates and surgical results of the patients whose operations were completed with the described method were consistent with the standard PNL results reported in the literature. By applying this method, we consider that we prevented kidney parenchymal damage that might occur with separate access. In addition, by ensuring access in a single session, we believe that we avoided the negative effects of the anesthesia being applied again and further psychological trauma for the patient due to a second procedure.

The strengths of our study are that it is the first of its nature in the literature, and we presented a new technique that can contribute to the literature. The limitations of our study include its retrospective design and the small number of patients included in the sample. Another limitation is the results reported from a single center and the absence of comparison between complicated and uncomplicated PNL cases. Further studies are needed in this regard.

CONCLUSION

In PNL operations, the 'methylene blue-guided retroperitoneoscopy technique' is a fast, safe, and practical option that provides direct retroperitoneoscopic vision to locate and re-access the calyx, which we apply in cases where access cannot be achieved due to extravasation.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by University of Health Sciences Bakırköy Dr.Sadi Konuk Training and Research Hospital Clinic Investigations Ethic Committee (Approval No: 2021-11-22, Date: 2021/11/15) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; SK, ME, Data acquisition; SK, ME, Data analysis and interpretation; SK, ME, Drafting the manuscript; SK, ME, Critical revision of the manuscript for scientific and factual content; SK, Statistical analysis; ME, Supervision; SK, ME.

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Original Research / Özgün Araştırma

The efficacy of regional analgesia techniques in urological robotic surgeries: a retrospective clinical study

Ürolojik robotik cerrahilerde bölgesel analjezi tekniklerinin etkinliği: retrospektif klinik çalışma

Sami Kaan Coşarcan[1], Alper Tunga Doğan[1], Mert Kılıç[2], Ömür Erçelen[1,3]

1 American Hospital, Department of Anesthesiology, Istanbul, Turkey

2 American Hospital, Department of Urology, Istanbul, Turkey

3 Koç University, School of Medicine, Department of Anesthesiology and Reanimation, Istanbul, Turkey

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Yazışma / Correspondence
Sami Kaan Coşarcan
American Hospital,
Teşvikiye, Güzelbahçe Sk. No:20,
34365 Şişli, İstanbul / Türkiye
E-mail: skcosarcan@gmail.com
Tel: +90 532 723 56 16

ORCID

S.K.C.	0000-0003-1506-6435
A.T.D.	0000-0001-5058-7039
M.K.	0000-0003-1707-3890
Ö.E.	0000-0002-5508-1077

Özet

Amaç: Robot yardımlı cerrahi, daha küçük kesiler, daha az postoperatif ağrı ve daha az intraoperatif kan kaybı ile günlük aktivitelere daha hızlı dönüş gibi avantajlar sunmaktadır. Torasik epidural analjezi, abdominal cerrahide mükemmel analjezi sağlar. Ancak özellikle torasik epidural analjezinin hipotansif etkisi minimal invaziv cerrahilerin hızlı iyileşmeye olan katkısını gölgede bırakmaktadır. Fasiyal plan blokları bu açıdan daha avantajlı olabilir. Bu çalışmada robotik prostatektomi, nefrektomi ve sistektomi operasyonlarında bölgesel analjezi tekniklerinin etkileri değerlendirildi.

Gereç ve Yöntemler: Etik Kurul onayı (2021.467.IRB1.134) alındıktan sonra Ocak 2018 ile Ocak 2022 yılları arasında robotik prostatektomi, nefrektomi ve sistektomi ameliyatı geçiren hastaların kayıtları retrospektif olarak incelendi.

Bulgular: Tam dokümantasyona sahip yüz kırk hasta bu çalışmaya dahil edildi. Kullanılan bölgesel analjezi yöntemleri kayıt altına alındı. Epidural analjeziye ek olarak fasyal plan bloklarının kullanıldığı görüldü. Robotik prostat ameliyatlarında transversus abdominis plan ve rektus kılıf blokları, robotik nefrektomi ameliyatlarında ise transversus abdominis plan bloklarının etkili analjezik özellik gösterdiği görülmüştür.

Sonuç: Özellikle robotik prostatektomi operasyonlarında transversus abdominis plan bloğu ve rektus kılıf bloğu kombinasyonu etkili postoperatif analjezi sunmaktadır.

Abstract

Objective: The advantages of robot-assisted surgery include shorter incisions, less postoperative pain, perioperative blood loss, and a faster return to daily functions. Thoracic epidural analgesia (TEA) provides highly satisfactory analgesia in abdominal surgery. However, its hypotensive effect, particularly in minimally invasive procedures, exceeds its contribution to rapid recovery. Fascial plane blocks may be more beneficial in that context. This study evaluated the effects of regional analgesia techniques in robotic prostatectomy, nephrectomy, and cystectomy operations.

Material and Methods: Following IRB Ethics Committee approval (2021.467.IRB1.134), the records of patients who had undergone robotic prostatectomy, nephrectomy, and cystectomy surgeries were retrospectively reviewed between January 2018 and January 2022.

Results: One hundred and forty patients with full documentation were included in this study. Various regional analgesia methods were used. Fascial plane blocks were seen to be used in addition to epidural analgesia. Transversus abdominis plane (TAP) and rectus sheath blocks exhibited satisfactory results in robotic prostate surgeries and TAP blocks in robotic nephrectomy operations.

Conclusion: In robotic prostatectomy and nephrectomy operations, we recommend fascial plane blocks as the first-choice method for postoperative analgesia.

The study was approved by Koç University IRB Ethic Committee (Approval No: 2021.467.IRB1.134, Date: 2021/12/30). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

Anahtar Kelimeler: rejyonel anestezi, robotik cerrahi, radikal prostatektomi, minimal invaziv cerrahi, fasyal plan blokları

Keywords: regional anesthesia, robotic surgery, radical prostatectomy, minimally invasive surgery, fascial plane blocks, recovery after surgery

INTRODUCTION

Radical prostatectomy (RP), generally practiced in the form of open retropubic RP or robot-assisted RP (RARP), is a commonly employed procedure in cases of localized prostate cancer (1). The benefits of minimally invasive surgery include decreased postoperative pain and a more rapid recovery. The advantages of robot-assisted surgery include shorter incisions, lower postoperative pain, perioperative blood loss, and a faster return to daily functions. It is important that the analgesic techniques employed in minimally invasive procedures should be efficacious and permit rapid mobilization (2).

RARP results in significant levels of discomfort, particularly during the first 24 h after surgery, deriving from abdominal pain, detrusor contraction, and transurethral catheter irritation (3). Thoracic epidural analgesia (TEA) yields highly satisfactory pain relief in abdominal surgery. However, its hypotensive effect, particularly in minimally invasive procedures, outweighs its contribution to a swift recovery. Fascial plane blocks may therefore be more beneficial (4). The transversus abdominis plane (TAP) block was originally described by Rafi in 2001 and has become one of the most common truncal blocks (5). Fascial plane blocks are effective in the case of somatic pain. Some studies have shown that the visceral pain component may be capable of being controlled. There are several approaches to TAP blocks, depending on the area of innervation/distribution and the location of the surgical incisions (6).

Epidural analgesia has been associated with fewer pulmonary-cardiac complications, shorter hospital stays, and faster recovery. However, the idea that the effects of epidural analgesia on recovery may not be particularly decisive has recently been proposed. Most enhanced recovery guidelines do not refer to epidural analgesia as the gold standard for minimally invasive surgery (7,8).

This study evaluated the effects of regional analgesia techniques in robotic prostatectomy, nephrectomy, and cystectomy operations.

MATERIAL AND METHODS

Following approval from the local ethical committee (2021.467.IRB1.134), the records of patients who had undergone robotic prostatectomy, nephrectomy, and cystectomy surgeries between January 2018 and January 2022 were reviewed retrospectively.

Patients' demographic data were recorded from preoperative assessment forms and the operation type from the surgery reports. The intraoperative anaesthesia assessment forms were examined to determine whether regional anaesthesia was performed, which regional anaesthesia technique was employed, and the type and quantity of opioids used during surgery. According to patient records and anaesthesia follow-up forms, 0.25% bupivacaine was used in all fascial plane blocks. When the local anaesthetic volumes were examined, 20 ml was used for the TAP block and 10 ml for the rectus sheath block. Postoperative transfer forms to the ward, nurse record forms, and follow-up forms were examined. Pain scores were assessed using a numerical rating scale (NRS) and recorded with vital signs and mobilization. In our clinic, postoperative pain management is provided with a multimodal approach. Paracetamol, a non-steroidal anti-inflammatory drug, is routinely used. Intravenous patient-controlled analgesia (PCA) with morphine is used in patients with no epidural catheter. Intravenous PCA is administered only as a bolus dose in patients undergoing fascial plane block. Postoperative PCA doses for epidural analgesia are standard in our clinic, depending on the type of surgery. In robotic urological surgeries, 0.125% bupivacaine and 2 μg ml-1 fentanyl are used as epidural PCA, and 5 ml h-1 infusion is set at a 6 ml bolus and 20 min lockout. We also investigated whether PCA devices were used for postoperative pain monitoring.

Exclusion Criteria

Individuals with known histories of cerebrovascular events, Alzheimer's disease and dementia, insufficient cognitive functions, chronic pain, or receiving long-term opioid therapy were excluded from the research.

Statistical Analysis

Statistical analysis was conducted using IBM SPSS Statistics for Windows version 25.0 software (IBM Corp., Armonk, NY, USA). The Shapiro-Wilk test was applied to determine the normality of the distribution of continuous variables. Descriptive statistics were presented using mean and standard deviation for normally distributed variables. The Mann-Whitney U test was applied to compare two dependent non-normally distributed groups and the paired sample t-test in the case of two dependent groups exhibiting normal distribution. Two-sided p-values lower than 0.05 were regarded as statistically significant.

RESULTS

The records of 143 robot-assisted prostatectomy, nephrectomy, and cystectomy surgeries were reviewed between January 2018 and January 2022. Three patients were excluded due to a history of cerebrovascular disease, and the study was completed with 140 patients with full documentation. The patients' demographic and surgical characteristics are shown in Table 1. Prostatectomy was performed in 99 cases (70,7%), nephrectomy in 30 (21,4%), and cystectomy in 11 (7,9%).

We observed that all patients received regional analgesia. Fascial plane blocks were applied to 49 patients (35%), and epidural analgesia to 91 (65%). Examination of the intraoperative anaesthesia form showed that epidural catheters were inserted from the T8-T9 interspace in 53 patients (58,25%) and the T10-T11 interspace in 38 (41,75%). The distribution of regional analgesia techniques according to the type of surgery performed is shown in Table 2 and Figure 1. Examination of the anaesthesia follow-up forms showed that TAP and rectus blocks were applied in prostatectomy operations and unilateral TAP blocks in nephrectomy operations.

The first 24-h and 24-48-h pain scores retrieved from the postoperative recovery unit and ward nurse follow-up forms are shown in Table 3. Patients who received epidural analgesia had statistically significantly lower pain scores than the other patients who received fascial plane block ($p<0.01$).

A comparison of the first 24 h NRS scores among patients receiving epidural analgesia and fascial plane blocks during prostatectomy and nephrectomy operations is shown in Table 4. Patients who underwent fascial plane block with TEA in prostatectomy and nephrectomy operations exhibited lower pain scores than those in epidural fascial plane blocks ($p<0.05$). Patients receiving epidural analgesia appear to have registered lower pain scores. Low pain scores were also noteworthy in patients who underwent fascial plane blocks. The doses of iv PCA used in patients with fascial plane blocks were examined. Forty-eight hours of morphine consumption according to the iv PCA doses in patients who underwent prostatectomy and nephrectomy is shown in Table 5.

Table 1. Patients' demographic and surgical characteristics [(number of patients (%), mean ± SD]

Age (years)	49.7
BMI (kg m^{-2})	35.4 ± 7.7
Hypertension	99 (77,7%)
Diabetes Mellitus	57 (40,7%)
Coronary Artery Disease	7 (5%)

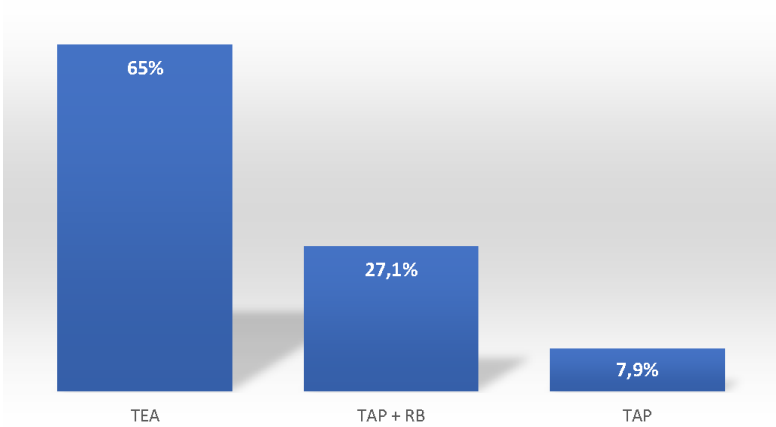
BMI: Body mass index

Table 2. Distribution of the regional analgesia techniques according to the types of surgery performed [number of patients (%)]

	TEA	TAP + RB	TAP
Prostatectomy	61 (61,6%)	38 (38,4%)	-
Nephrectomy	19 (63,3%)	-	11 (36,7%)
Cystectomy	11 (100%)	-	-

TEA: Thoracic epidural analgesia, **TAP:** Transversus abdominis plane block, **RB:** Rectus sheath block

Figure 1. Distribution of the regional analgesia techniques employed in robotic surgeries



TEA: Thoracic epidural analgesia, **TAP:** Transversus abdominis plane block, **RB:** Rectus sheath block

Table 3. A comparison of first 48-hour pain scores (NRS) for regional analgesia techniques in robotic surgeries

	TEA	TAP+RB	TAP
0 – 24 hours	0.9±0.7*	2±0.6	5.1±1.3
24 – 48 hours	0.5±0.3*	1.7±0.6	3.1±0.6

NRS: Numerical rating scale, **TEA:** Thoracic epidural analgesia, **TAP:** Transversus abdominis plane block, **RB:** Rectus sheath block,

*Compare between TEA and other fascial plane blocks p<0,01

Table 4. A comparison of first 24-hour pain scores (NRS) for regional analgesia techniques in robotic prostatectomy and nephrectomy surgeries

	Prostatectomy		Nephrectomy	
	TEA	TAP+RB	TEA	TAP
NRS	0.7±0.6*	2±0.6	1.1±0.7+	3.3±1.5

NRS: Numerical rating scale, **TEA:** Thoracic epidural analgesia, **TAP:** Transversus abdominis plane block, **RB:** Rectus sheath block,

*Comparison of patients who underwent fascial plane block with TEA in prostatectomy operations p<0,05

+Comparison of patients who underwent fascial plane block with TEA in nephrectomy operations p<0,05

Table 5. Postoperative 48-hour intravenous morphine consumption of patients in robotic surgeries with fascial plane blocks (Mean ± SD)

	Prostatectomy	Nephrectomy
Morphine (mg)	5.7±2.6*	25.5±8.1

*p<0,05

The high opioid consumption in nephrectomy patients is particularly noteworthy. This result suggests that only tap block alone may be insufficient in postoperative pain management in nephrectomy operations.

Mobilization problems due to hypotension have been observed in patients receiving epidural analgesia. Mobilization was limited on the first postoperative day in five patients with cystectomy, four with prostatectomy, and four with nephrectomy. No mobilization problems were observed in patients who underwent fascial plane block. No complications deriving from fascial plane blocks were observed.

DISCUSSION

The findings of this retrospective study show that effective analgesia can be provided by a combination of TAP block and RB. However, TEA is known to provide the standard gold analgesia.

Ultrasound-guided TAP blocks are applied in a range of different locations. The anticipated analgesia pattern is heterogeneous and depends on the particular approach adopted. The subcostal approach is most frequently recommended for upper abdominal procedures, while the lateral and posterior approaches are suitable for lower abdominal procedures (9,10). Chiancone et al. reported that TAP block provided satisfactory analgesia in robotic prostate surgeries in a 93-case series (11). Pain management in patients undergoing robot-guided procedures can be uncertain and difficult. Most studies have not reported any serious side effects. The effective analgesic properties and easy applicability of the TAP block are causing it to grow in popularity (12). Rogers et al. showed that the TAP block results in significantly lower opioid consumption in the first postoperative 24-hour period in robot-assisted prostatectomy surgeries (13). Taninishi et al. investigated the effectiveness of the TAP block in robotic prostatectomy, performing a TAP block that compared 0.9% saline solution and 0,375% ropivacaine. The authors described the TAP block as effective in using a local anesthetic (5). In their retrospective study of robot-assisted laparoscopic prostatectomy operations, Shahait et el. compared TAP blocks with local anaesthesia instead of port incision and observed significantly lower pain scores with TAP blocks (14). Procedure-specific postoperative pain management guidelines have been published and recommend TAP blocks as the first-choice regional analgesia technique in the case of laparoscopic/robotic RP (8,15). The results of the present study also show that TAP blocks can establish effective analgesia in robotic surgery. We think adding the rectus sheath block to the TAP block enhances patient comfort. Our results for opioid consumption with the TAP block are much lower than the figures reported in the previous literature. We attribute this to adding the rectus sheath block to the TAP block.

Some studies have shown that TEA and general anaesthesia improve intraoperative ventilation/oxygenation. It is also reported to affect clinical and radiological pulmonary complications (16,17) positively. A combination of general and epidural anaesthesia may reduce the severity of diaphragmatic dysfunction in the postoperative period following robot-assisted laparoscopic RP compared to conventional general anaesthesia (18). Studies have also shown that combined general and thoracic epidural anaesthesia positively affect NO inactivation and oxidative stress (19).

The rectus sheath block is a particularly popular abdominal wall block. The injection of a local anaesthetic between the rectus muscle and posterior rectus sheath results in the blockade of the anterior cutaneous branches of the lower thoracic spinal nerves. Rectus sheath block exhibits effective analgesic properties in robotic prostatectomy (20,21). The present study shows that a rectus sheath block was added to the TAP block in robotic surgeries, the aim being to enhance the po-

tency of the TAP block. Based on the study results, we think that the superior postoperative analgesic efficacy observed derives from the use of this combination.

CONCLUSION

Urologic robotic surgeries are procedures that require meticulous pain control. Despite their minimally invasive nature, the expected postoperative pain severity is by no means minimal. Fascial plane blocks can be used instead of epidural analgesia in minimally invasive surgeries. The combination of TAP and RB seems to be a good choice for postoperative analgesia, especially in robotic prostatectomy operations.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by Koç University IRB Ethical Committee (Approval No: 2021.467.IRB1.134, Date: 2021/12/30) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; SKC, ATD, MK, ÖE, Data acquisition; SKC, ATD, MK, Data analysis and interpretation; SKC, ATD, MK, ÖE, Drafting the manuscript; SKC, ATD, Critical revision of the manuscript for scientific and factual content; SKC, ÖE, Statistical analysis; SKC, ATD, Supervision; ÖE.

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Original Research / Özgün Araştırma

Systematic versus cognitive targeted biopsy: evaluation of parameters related to clinically significant prostate cancer and comparison of detection rates

Sistematik ve kognitif hedefe yönelik biyopsi: klinik olarak anlamlı prostat kanseri ile ilgili parametrelerinin değerlendirilmesi ve tespit oranlarının karşılaştırılması

Cevper Ersöz[1], Abdullah İlktaç[1], Senad Kalkan[1], Yunus Kayalı[2], Habib Akbulut[1], Hüseyin Toprak[3], Bayram Doğan[1]

1 Bezmialem Vakıf University, Faculty of Medicine, Department of Urology, Istanbul, Turkey

2 Marmara University, Pendik Training and Research Hospital, Department of Urology, Istanbul, Turkey

3 Bezmialem Vakıf University, Faculty of Medicine, Department of Radiology, Istanbul, Turkey

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Yazışma / Correspondence
Cevper Ersöz
Bezmialem Vakif University, Faculty of Medicine, Adnan Menderes Bulvarı, Vatan Caddesi, 34093, Fatih, Istanbul / Turkey
E-mail: cersoz@bezmialem.edu.tr
Tel: +90 532 582 32 91

ORCID

C.E.	0000-0001-5508-9370
A.İ.	0000-0002-0599-5436
S.K.	0000-0001-6000-8504
Y.K.	0000-0002-7836-0490
H.A.	0000-0002-1681-1719
H.T.	0000-0002-6641-7648
B.D.	0000-0002-3007-8525

Özet

Amaç: Bu çalışmanın amacı, kognitif hedefe yönelik biyopsi (KHB) ve sistematik biyopsinin (SB) klinik anlamlı prostat kanseri (kaPKa) tespit oranlarını karşılaştırmak ve kaPKa tespit oranlarını etkileyen faktörleri ortaya çıkarmaktır.

Gereç ve Yöntemler: 2016-2019 yılları arasında lokalize prostat kanseri tanısı alan hastalar retrospektif olarak değerlendirildi. KHB ve SB yapılan hastalar kaydedildi. İndeks lezyondan alınan KHB kor sayısı, yaş, prostat spesifik antijen (PSA) seviyesi, gleason skoru, ISUP (International Society of Urological Pathology) derecesi, PIRADS (Prostate Imaging and Data Reporting System) skoru, indeks lezyonun büyüklüğü ve parmakla rektal muayene (PRM) bulguları kaydedildi. Ayrıca lezyonun magnetik rezonans görüntüleme (MRG)' deki lokalizasyonu ile PRM ile tespit edilen nodülün lokalizasyonu arasında bir uyum olup olmadığı da araştırıldı.

Bulgular: Seksen hasta çalışmaya dahil edildi. SB'li 55 (%68.7) hastada kaPKa saptanırken, tek başına KHB ile 35 (%43.7) hastada kaPKa saptandı (p<0.01). SB ile 2 kaPKa hastası atlanmasına karşın KHB ile kaPKa hastaların % 35'ine tanı konulamadı. SB ve KHB'de kaPKa tespit oranları, PRM ve mpMRG arasında bir uyum olan hastalarda anlamlı olarak daha yüksekti (sırasıyla p= 0.012 ve p<0.01). KHB'de kaPKa saptanan hastalarda ortalama yaş, prostat hacmi, PSA, lezyon çapı, kor sayısı ve (PGVRS) skoru açısından anlamlı farklılıklar saptandı (sırasıyla p=0.005, p=0.02, p=0.005, p=0.003, p=0.017 ve p=0.002).

Sonuç: SB, kaPKa tanısında önemini korumaktadır. Daha büyük lezyonları olan hastalarda KHB tercih edilebilir.

Anahtar Kelimeler: prostat kanseri, prostat biyopsisi, manyetik rezonans görüntüleme, hedefe yönelik biyopsi

Abstract

Objective: This study aims to compare the clinically significant prostate cancer (csPCa) detection rates of cognitive targeted biopsy (CTB) and systematic biopsy (SB) and to reveal the factors affecting csPCa detection rates.

Material and Methods: Patients diagnosed with localized prostate cancer between 2016-2019 were evaluated retrospectively. Patients who underwent SB and concomitant CTB were recorded. The number of cores taken from the index lesion in CTB, age, prostate-specific antigen (PSA) level, Gleason score, International Society of Urological Pathology (ISUP) grade, Prostate Imaging and Data Reporting System (PI-RADS) score, the diameter of index lesion, and digital rectal examination (DRE) findings was recorded. We also studied whether there was a concordance between the localization of the lesion on MRI (magnetic resonance imaging) and the localization of the nodule detected on DRE.

Results: Eighty patients were included in the study. csPCa was detected in 55 (68.7%) patients with SB, whereas CTB alone detected csPCa in 35 (43.7%) patients (p<0,01). SB missed 2 patients with csPCa, but 35% of the men with csPCa would be missed by CTB. Detection rates of csPCa in SB and CTB were significantly higher in patients with a concordance between DRE and mpMRI (p= 0.012 and p<0.01, respectively). In patients who had csPCa in CTB, significant differences were detected in the mean age, prostate volume, PSA, lesion diameter, number of cores, and PI-RADS score (p=0.005, p=0.02, p=0.005, p=0.003, p=0.017, and p=0.002, respectively)

Conclusion: SB maintains its importance in the diagnosis of csPCa. CTB can be preferred in patients with larger lesions.

Keywords: prostate cancer, prostate biopsy, magnetic resonance imaging, targeted biopsy

The study was approved by Bezmialem Vakıf University Hospital Ethic Committee (Approval No: 2021/184, Date: 2021/06/22). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

INTRODUCTION

Prostate cancer (PCa) is mens second most commonly observed malignancy, and it forms approximately 15% of all malignancies (1). After the widespread use of prostate-specific antigen (PSA), there has been a significant elevation in PCa incidence (2). In patients with increased PSA or suspicious digital rectal examination (DRE), the standard method for the diagnosis of PCa is a transperineal or transrectal ultrasound-guided biopsy (TRUS-BX) (3). It is carried out randomly, as ultrasound cannot differentiate benign prostatic tissue from the foci of PCa, and typically, 12 cores are obtained from the peripheral zone (4). Widespread use of PSA and TRUS-BX has increased the number of patients diagnosed at an earlier stage. However, the rate of clinically insignificant prostate cancer (ciPCa) has also been observed (5).

Recently, there have been significant improvements in prostate MR imaging techniques. Multiparametric MRI (mpMRI) has led to significant advances in the assessment of PCa before biopsy (6,7). Lesions detected on mpMRI are reported following the Prostate Imaging and Data Reporting System (PIRADS) version 2 document and classified on a scale from 1 to 5 (8). Systematic transrectal ultrasound-guided biopsy (SB) may miss clinically significant prostate cancer (csPCa), leading to recurrent biopsies; it may also diagnose insignificant cancer and may result in unnecessary treatment (9,10). The sensitivity of mpMRI in detecting PCa with the International Society of Urological Pathology (ISUP) grade > 2 is very high, but the sensitivity for ISUP grade 1 is very low (11,12). The potential of detecting csPCa with fewer biopsy cores and avoiding ciPCa has led to the idea of targeting only the suspicious areas on mpMRI.

Targeted prostate biopsy by using mpMRI images is performed in 3 ways: (1) in-bore targeted biopsy carried out with MRI guidance; (2) fusion targeted biopsy, in which with the help of software, mpMRI images are combined with real-time transrectal ultrasound imaging; and (3) cognitive targeted biopsy (CTB), in which the operator evaluates the localization of suspicious lesions on mpMRI before biopsy and combines MRI and TRUS images in his mind during biopsy procedure (10,13,14). In-bore MRI targeted, and fusion biopsies are expensive and require special equipment, whereas CTB is cost-effective, easy to perform, and does not need special equipment (10,15). The main disadvantage of CTB is that it is highly operator-dependent (13,16). There is controversy about the superiority of these techniques over each other and whether they eliminate the need for systematic biopsy. Current guidelines recommend having a mpMRI prior to biopsy and combining targeted and systematic biopsies in cases with a PIRADS ≥ 3 lesions (3).

It was aimed to compare csPCa detection rates of CTB and SB in patients with PCa and to reveal the factors that affect the csPCa detection rates in this study.

MATERIAL AND METHODS

Patients diagnosed as localized PCa by TRUS-BX between 2016 and 2019 were evaluated retrospectively, and patients who underwent SB and concomitant CTB were recorded. All patients had an elevated PSA and/or suspicious DRE and a discrete index lesion of PIRADS ≥ 3 on mpMRI. Patients with a PIRADS score ≤2, PSA >20 ng/ml, a history of PCa or previous prostate biopsy, and patients with the suspicion of metastatic disease were excluded. All patients underwent standard 12-core SB, and additional cognitive targeted biopsies were carried out at the same session. The number of cores obtained from the index lesion in CTB was noted. Patient age, PSA level, Gleason score, ISUP score, PIRADS score, the maximum diameter of the index lesion, and DRE findings were recorded. We also evaluated whether there was a concordance between the localization of the lesion detected on MRI and the localization of the nodule detected in DRE. Clinically significant PCa was defined as Gleason grade ≥7. Ethical approval was obtained from the Institutional Ethics Committee (2021/184).

mpMRI

Patients had a 1.5 T mpMRI scan before the biopsy. Imaging protocol includes T2 weighted multiplanar, diffusion-weighted, dynamic contrast-enhanced, and T1 weighted images with fat suppression obtained in accordance with the standards defined by guidelines (17,18). Lesions on the MRI were categorized and scored following the PIRADS version 2 document by a

radiologist who has been interpreting multiparametric prostate MRI images for more than 4 years. Patients with PIRADS score 3 (presence of csPCa is equivocal), PIRADS score 4 (csPCa presence is probable), and PIRADS score 5 (presence of csPCa is highly probable) lesions on MRI underwent CTB. A single index lesion was biopsied in each patient. In men with more than one lesion on MRI, the biopsy was performed from the lesion with the higher score.

Biopsy Technique

Prostate biopsies were performed by 3 colleagues with more than 10 years of experience in TRUS-BX procedures performed prostate biopsies. In SB, 12 cores were randomly obtained from the peripheral zone, including the bilateral base, midgland, and apex transrectally. CTB was carried out under TRUS guidance in the axial scan. Lesions detected in MRI were aimed at ultrasonography according to the zonal anatomy of the prostate and anatomical structures such as nodules and cysts.

Statistical Analysis

Statistical analyses were conducted using the SPSS 17.0 statistical program (SPSS Inc., Chicago, IL, USA). While evaluating the study data, the Pearson Chi-Square test was used to compare qualitative data according to groups and descriptive statistical methods (Mean, Standard Deviation, Frequency, and Ratio). Skewness and kurtosis values were used to decide whether the distribution was normal or not. The cut-off points of the kurtosis and skewness values should be within 3 as the absolute value for the skewness and 10 as the absolute value for the kurtosis (19). Analysis showed that all our data had a normal distribution. An Independent Sample T test was used to compare the quantitative data showing normal distribution according to the groups. Statistical significance was defined as a P value < 0.05.

RESULTS

Patient characteristics are given in Table 1. Eighty patients were included in the study. Fifty-seven

Table 1. Characteristics of the patients

Number of patients	80
Age, years	65.6 ±7.24
PSA, ng/ml	8.53±4.64
Prostate volume, ml	47.86±19.41
Lesion diameter, mm	12.02±5.34
Total Number of patients with clinically significant prostate cancer	57 (71.25)
Number of patients with clinically significant cancer in standard biopsy (%)	55 (68.75)
Number of Patients with clinically significant cancer in cognitive biopsy (%)	35 (43.75)
Patients with positive DRE (%)	64 (80)
PIRADS Score	
3 (%)	14 (17.5)
4 (%)	44 (55)
5 (%)	22 (27.5)
ISUP Score	
1(%)	23 (28.8)
2(%)	24 (30)
3(%)	24 (30)
4(%)	5(6.2)
5(%)	4(5)

PSA: Prostate specific antigen; **PIRADS:** Prostate Imaging and Data Reporting System;
ISUP: International Society of Urological Pathology.

(71.2%) patients were diagnosed as csPCa. MRI scan revealed that 14 (17.5%) patients had a PIRADS score of 3 lesions, 44 (55%) patients had a PIRADS score of 4 lesions, and 22 (27.5%) patients had a PIRADS score of 5 lesions. The mean number of cores per lesion was 2.07±1.1 in CTB.

Pathology results of systematic and cognitive biopsies are shown in Table 2. Clinically significant PCa was detected in 55 (68.7%) patients with SB, whereas CTB alone detected csPCa only in 35 (43.7%) patients. This difference was significant (p<0.01). SB missed only 2 patients with csPCa, and additional CTB diagnosed these patients. Thirty-five percent of the men with csPCa would be missed by CTB but diagnosed by SB. In CTB samples, 29 (36.2%) patients were reported as having benign prostatic hyperplasia, but in 12 of these patients, csPCa was detected with SB. Also, 16 (20%) patients had ciPCa according to CTB samples, but in 10 patients, csPCa was detected with SB.

In 24 (30%) patients, there was a concordance between DRE and mpMRI; that is to say, the localization of the lesion detected on MRI was the same as the localization of the nodule palpated in DRE. There was no such concordance in 56 (70%) patients; either there was no nodule in DRE, or the localization of the nodule was different from the localization of the lesion. csPCa detection rates in SB and CTB were significantly higher in men with a concordance between DRE and mpMRI (p= 0.012 and p<0.01, respectively). Of the 24 patients who had a concordance between MRI and DRE, 21 (87.5%) had csPCa detected with SB, and 20 (83.3%) had csPCa detected in the CTB. In 56 patients with no concordance between DRE and MRI, only 15 (26.7%) patients had csPCa in CTB, and 33 (58%) patients had csPCa in SB.

A nodule was palpated with DRE in 64 (80%) patients. When SB results were evaluated, 44 (68.7%) of the 64 patients had csPCa, and 20 (31.3%) patients had ciPCa. Sixteen patients had normal DRE; 11 (68.7%) of the 16 patients had csPCa, and 5 (31.2%) had ciPCa. There was no statistically significant relationship between DRE and the presence of csPCa (P=0.905). According to the CTB samples, 31 (48.4%) patients with a palpable nodule had clinically significant, and 33 (51.6%) had clinically insignificant PCa. In 16 patients with normal DRE, 4 (25%) had clinically significant, and 12 (75%) had clinically insignificant PCa. No statistically significant relationship between DRE and csPCa was detected (p=0.091). Table 3 shows the comparison of csPCa presence with the PIRADS score. Results of this study showed that the csPCa detection rate increased with the increasing PIRADS score for both STB and CTB (p=0.02 and p=0.003, respectively).

When SB samples were evaluated, no differences were observed between patients with csPCa and ciPCa in age and prostate volume (p=0.499 and p=0.097, respectively). Table 4 reports that mean PSA, lesion diameter, and PIRADS score were significantly greater in patients with csPCa (p=0.001, p=0.014, and p=0.02, respectively). As shown in Table 5, in patients who had csPCa in the CTB samples, significant differences were detected in the mean age, prostate volume, PSA, lesion diameter, number of cores, and the PIRADS score (p=0.005, p=0.02, p=0.005, p=0.003, p=0.017 and p= 0.002 respectively).

Table 2. Pathology results of the systematic and cognitive biopsies

	Systematic Biopsy (n=80)	**Cognitive Biopsy (n=80)**
BPH (%)	1 (1.25)	29 (36.25)
ISUP 1 (%)	24 (30)	16 (20)
ISUP 2 (%)	24 (30)	20 (25)
ISUP 3 (%)	22 (27,5)	12 (15)
ISUP 4 (%)	7 (8,75)	0
ISUP 5 (%)	2 (2.5)	3 (3.75)

BPH: Benign prostatic hyperplasia; **ISUP:** International Society of Urological Pathology

Table 3. Comparison of clinically significant prostate cancer presence with PI-RADS score

	PIRADS 3 (n=14)	PIRADS 4 (n=44)	PIRADS 5 (n=22)	p
No. of patients with clinically significant Pca in standard biopsy (%)	7 (50)	30 (68.1)	18 (81.8)	0.02
No. of patients with clinically significant Pca in cognitive biopsy (%)	2 (14.2)	17 (38.6)	16 (72.7)	0.003

PIRADS: Prostate Imaging and Data Reporting System; **Pca:** Prostate cancer

Table 4. Baseline characteristics of the patients with clinically significant and insignificant prostate cancer in systematic biopsy.

	Patients with clinically significant cancer in standard biopsy (n=55)	**Patients with clinically insignificant cancer/BPH in standard biopsy (n=25)**	**p**
Age, years	64.70±11.31	65.23±7.34	0.499
Prostate volume, ml	45.93±19.3	51±18.22	0.097
PSA, ng/ml	10.03±6.77	6.63±3.76	0.001
Lesion diameter, mm	13.02±5.54	9.96±4.32	0.014
PIRADS score			0.13
3 (%)	7 (12.73)	7 (28)	
4 (%)	30 (54.55)	14 (56)	
5 (%)	18 (32.72)	4 (16)	

PSA: Prostate specific antigen; **PIRADS:** Prostate Imaging and Data Reporting System

Table 5. Baseline characteristics of the patients with clinically significant and insignificant prostate cancer or BPH in cognitive targeted biopsy.

	Patients with clinically significant cancer in cognitive biopsy (n=35)	**Patients with clinically insignificant cancer/BPH in cognitive biopsy (n=45)**	**p**
Age, years	68.37±5.36	63.48±7.19	0.005
Prostate volume, ml	43.26±16.93	51.44±19.28	0,02
PSA, ng/ml	11.21±7.67	7.14±6.10	0.005
Lesion diameter, mm	14.43±5.91	10.15±4.01	0.003
Number of cores	2.20±1.35	1.97±1.13	0.017
PIRADS score			0.002
3 (%)	2 (5.71)	12 (26.67)	
4 (%)	17 (48.57)	27 (60)	
5 (%)	16 (45.72)	6 (13.33)	

PSA: Prostate specific antigen; **PIRADS:** Prostate Imaging and Data Reporting System

DISCUSSION

The results of this study regarding the diagnosis rate of csPCa with cognitive biopsy contradicted the data in the literature. In the majority of the studies, better results were obtained with MRI-targeted biopsies. A meta-analysis reported that the detection of csPCa was significantly higher in MRI-guided biopsies (in-bore, fusion, or cognitive) compared to SB, and only 10% of patients with csPCa cases would be missed without SB (20). Kasivisvanathan et al. stated that MRI-guided biopsies diagnosed more csPCa than SB, and the ratio of csPCa missed by MRI-guided biopsy but diagnosed by additional SB was 13% (21). John et al. performed CTB and concomitant SB in 131 men; 17.6% of the clinically significant cancers were detected with CTB only, and 8.4% were detected with SB only (22). In the current study, the csPCa detection rate was significantly higher in SB compared to CTB; 35% of the significant cancers would be missed without SB. The results of the study conducted by von Below et al. were similar to this study. They performed mpMRI and then CTB in 53 patients with newly diagnosed PCa. Systematic biopsy diagnosed 32 significant cancers, whereas cognitive biopsy diagnosed 20 and missed 17 significant cancers, and only 5 significant cancers were diagnosed with additional cognitive biopsy (23). The different aspect of their study was that lesions with PIRADS scores 1 and 2 were also biopsied.

DRE has a significant role in the clinical diagnosis of PCa. In patients with an abnormal DRE, the risk of detecting PCa increases (24). Omri et al. performed systematic and MRI-fusion biopsies in 47 DRE-negative and 39 DRE-positive patients (25). They reported that in patients with palpable nodules, the detection rate of csPCa per core was significantly higher in targeted biopsy samples compared to patients with normal DRE. In a study of 12-core systematic and concomitant CTB, a 10.1% improvement in cancer detection rate by additional targeted biopsies was reported in patients with normal DRE, and it was concluded that additional targeted biopsies did not increase the detection rate in patients with positive DRE (26). We found no significant relationship between DRE and csPCa. However, when we evaluated the patients who had a concordance between DRE and MRI, we found that csPCa detection rates in standard and cognitive biopsies were significantly higher in this subgroup of patients.

The result that the higher PIRADS scores were related to an increased detection rate of csPCa is consistent with the literature. John et al. stated that the csPCa detection rate was significantly greater in score 4 and 5 lesions (22). In a large prospective study, the csPCa detection rate of PIRADS scores 3, 4, and 5 was 23%, 49%, and 77%, respectively (27). A significant association between the PIRADS score and the presence of csPCa was found.

Lesion diameter has an important effect on the PCa detection rate. Ozden et al. performed cognitive and concomitant systematic prostate biopsies in 219 patients with elevated PSA and/or suspicious DRE and lesions on MRI with PIRADS score ≥ 3 and reported that the csPCa detection rate of CTB was significantly higher for lesions ≥ 10 mm (28). Prostate volume was also evaluated in the same study, and it was reported that the clinically significant PCa detection rate of CTB has significantly elevated in men with a prostate volume <30 ml. John et al. found no relationship between lesion diameter and the clinically significant PCa detection rate (22). We found that lesion diameter was significantly larger and prostate volume was significantly smaller in patients with csPCa in both SB and CTB samples compared to patients with insignificant PCa. Patients with larger lesion diameters or smaller prostate volumes have a higher clinically significant cancer detection risk. Studies show that MRI-fusion biopsy is more successful than cognitive biopsy in smaller lesions (20).

Generally, it is recommended to obtain 2-4 cores per lesion in CTB. Sonmez et al. reported that 2-3 biopsy cores are adequate in PIRADS 4 and 5 lesions, but at least a 4-core biopsy should be performed in PIRADS 3 lesions (29). Another study reported that at least 2 cores should be taken to obtain a better pathological result (30). In this study, the mean number of cores per lesion in patients with csPCa, according to cognitive biopsy samples, was 2.2±1.3. It was significantly high-

er compared to the patients with ciPCa. Following the literature, we think at least 2 cores should be taken per lesion in targeted biopsies.

In this study, the success of cognitive biopsy in detecting csPCa was lower than systematic biopsy, which can be due to various reasons. The experience of the operators performing the CTB plays a crucial role in achieving a healthy result. Operators in this study have more than 10 years of experience in SB, but they are less experienced in the cognitive biopsy. Stabile et al. stated that the csPCa detection rate was highly affected by operator experience in targeted biopsy techniques. A greater csPCa detection rate was observed as the number of targeted biopsies performed increased (31). Communication between the operators and radiologists before the biopsy is crucial in determining the exact localizations of suspicious lesions. There may have been a deficiency in this regard in our study. The low number of patients is another limitation. Studies with a larger number of patients may yield different results.

CONCLUSION

In conclusion, we believe SB still maintains its importance in the diagnosis of csPCa. CTB can be preferred in patients with larger lesions and concordance between localization of nodules on DRE and localization of suspicious lesions on mpMRI. In addition to CTB, a concomitant SB should always be performed.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by Bezmialem Vakıf University Hospital Ethic Committee (Approval No: 2021/184, Date: 2021/06/22) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; CE, Aİ, Data acquisition; YK, BD, Data analysis and interpretation; CE, HT, Drafting the manuscript; CE, Aİ, Critical revision of the manuscript for scientific and factual content; SK, Statistical analysis; BD, Supervision; CE, HA.

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Case Report / Olgu Sunumu

A rare cause of hematuria, intravesical ectopic pregnancy; case report

Hematürinin nadir bir nedeni intravezikal ektopik gebelik; olgu sunumu

Adem Tunçekin[1], Adnan İncebıyık[2], Mehmet Demir[3], İsmail Yağmur[3], Eyyup Sabri Pelit[3], Bülent Katı[3], Halil Çiftçi[3]

1. Şanlıurfa Training and Research Hospital, Department of Urology, Şanlıurfa, Turkey
2. Harran University, Faculty of Medicine, Department of Obstetrics and Gynaecology, Şanlıurfa, Turkey
3. Harran University, Faculty of Medicine, Department of Urology, Şanlıurfa, Turkey

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Yazışma / Correspondence
Adem Tunçekin
Şanlıurfa Eğitim ve Araştırma Hastanesi, Yenice Mah. Yenice Yolu No:1 Eyyübiye / Şanlıurfa
E-mail; dr_adem65@hotmail.com
Tel: +90 414 317 17 17
Fax: +90 414 317 26 21

ORCID

A.T.	0000-0001-9951-2556
A.İ.	0000-0002-0500-4604
M.D.	0000-0002-3618-0547
İ.Y.	0000-0002-4208-5095
E.S.P.	0000-0001-8550-5072
B.K.	0000-0002-4024-5147
H.Ç.	0000-0002-4771-0232

Özet

İntravezikal ektopik gebelik çok nadir görülen bir durumdur. Hastalar geleneksel ektopik gebeliklerden farklı olarak genellikle hematüri ile başvururlar.

Olgumuz 22 yaşında olup karın ağrısı ve idrarda kanama şikayeti ile başvurdu. Fizik muayenede abdominal hassasiyeti gözlendi. ß-HCG 10033 IU/ml olarak ölçüldü. Ultrasonografide vezikouterin fistül traktı ve mesanede dış gebelik kesesi ile uyumlu görünüm izlendi. Sistoskopide mesane sağ yan ile posterior duvar birleşiminde fistül traktı ostiumu ve ektopik gebelik kesesi ile uyumlu kitle görüldü. Gözlenen yapı rezeke edildi ve koterize edilerek hemostaz sağlandı. Takiplerinde komplikasyon gözlenmeyen hasta eksterne edildi. Pelvik cerrahi öyküsü olan, adet gecikmesi ve hematüri şikâyeti ile başvuran hastalarda ayırıcı tanıda ektopik gebelik akılda tutulması gereken tanılardan biri olmalıdır.

Anahtar Kelimeler: vezikal gebelik, vezikouterin fistül, hematüri

Abstract

Intravesical ectopic pregnancy is a very rare condition. Unlike traditional ectopic pregnancies, patients generally present with hematuria.

Our case presented with abdominal pain and urinary bleeding. Abdominal tenderness was observed on physical examination. The ß-HCG was measured as 10033 IU / ml. In ultrasonography, an appearance compatible with a vesicouterine fistula tract and an ectopic gestational sac in the bladder were observed. In cystoscopy, a mass compatible with a fistula tract ostium and ectopic gestational sac was observed at the junction of the right side of the bladder and the posterior wall. The observed structure was resected and cauterized to achieve hemostasis. No complications were observed during the follow-up, and the patient was discharged.

Ectopic pregnancy should be one of the differential diagnoses of patients with a history of pelvic surgery who present with complaints of menstrual delay and hematuria.

Keywords: vesical pregnancy, vesicouterine fistula, hematuria

The article has been presented as an online oral presentation 14. National Endourology Congress on 1-4 April 2021.

INTRODUCTION

Ectopic pregnancy is defined as the implantation of the developing blastocyst outside the uterine cavity (1). The diagnosis is usually made in the first trimester. Although the use of ultrasonography is the first option for diagnosis, serum ß-human chorionic gonadotropin (ß-HCG) and progesterone measurements may also be helpful (2). Although the clinical findings of the disease vary according to the location of the ectopic pregnancy, it can generally be identified by vaginal bleeding, pelvic pain, and abdominal pain (3). However, it is not always easy to diagnose an ectopic pregnancy.

The aim of this presentation is; to present the clinical findings, diagnostic methods and treatment modalities of an intravesical ectopic pregnancy patient presenting with the complaints of menstrual delay, abdominal pain and hematuria.

CASE REPORT

A 22-year-old patient was admitted to the emergency department with complaints of abdominal pain and profuse urinary bleeding. It was learned from the anamnesis of the patient that she had a 15-day delay in menstruation and had three previous caesarean sections. It was also learned that she had occasional urinary bleeding after her last birth, but she never went to the hospital. While abdominal tenderness was observed in the physical examination of the patient, defense and rebound were not detected. No abnormal results were found except for ß-HCG 10033 IU / ml in laboratory tests and erythrocyte 100 / HPF in complete urinalysis. In the ultrasonography, free fluid in the uterine cavity, an appearance compatible with a fistula tract between the uterus and the bladder, an irregular appearance and a hematoma compatible with an ectopic gestational sac of approximately 21*29 mm in the bladder were observed. Emergency cystoscopy and necessary intervention were planned after obtaining informed consent from the patient. Therefore, no additional imaging was performed. In the cystoscopic examination, a mass compatible with the fistula tract ostium and ectopic gestational sac was observed at the junction of the right lateral wall of the bladder and the posterior wall. The pouch was resected with the help of a resectoscope. Hemostasis was achieved by cauterizing the bleeding areas (Figure 1). Then, liquid was aspirated in the uterine cavity with an injector by the gynecologist. Catheterized with a 3-way Foley and bladder was continuously irrigated. Since hematuria was not observed on the postoperative 1st day, bladder irrigation was terminated. The patient, who did not experience any problems in the postoperative follow-up, was discharged on the 2nd postoperative day with a Foley catheter. The Foley catheter was removed 14 days later. Symptoms such as urinary incontinence or hematuria were not observed. The diagnosis was confirmed as an ectopic pregnancy as a result of pathology examination of the materials taken. It was thought that the fistula tract might have closed with conservative treatment. Despite this, cystoscopy and, if necessary, additional intervention were planned. However, control cystoscopy approximately 2 months later was evaluated as normal.

DISCUSSION

Ectopic pregnancy is a devastating clinical condition that can cause significant morbidity and mortality when undiagnosed. Early diagnosis of the disease is extremely important in terms of preserving fertility (4). However, the main problems encountered in diagnosis are the variance in symptoms in each patient and that the symptoms are not specific to the disease. In our case report, an ectopic pregnancy caused by an uterovesical fistula secondary to previous caesarean section is presented. In this intravesically located ectopic pregnancy, unlike traditional ectopic pregnancy types, the main complaint of the patient was hematuria.

Vesicouterine fistulas are a rare condition and constitute approximately 1-4% of urogenital fistulas. Its incidence increases in cases of multiple caesarean section (5). In addition, placenta percreta, endometriosis can also be seen after vaginal delivery after previous caesarean delivery (6). Patients may present with symptoms of cyclic hematuria, amenorrhea, urine discharge from the vagina, urinary incontinence, and abortus in the first period (7). In the diagnosis, ultrasonography and cystoscopy can be performed initially, and if necessary, cystography, intravenous pyelography and magnetic resonance imaging can be performed (8). We observed that our case was in the early pregnancy period of sev-

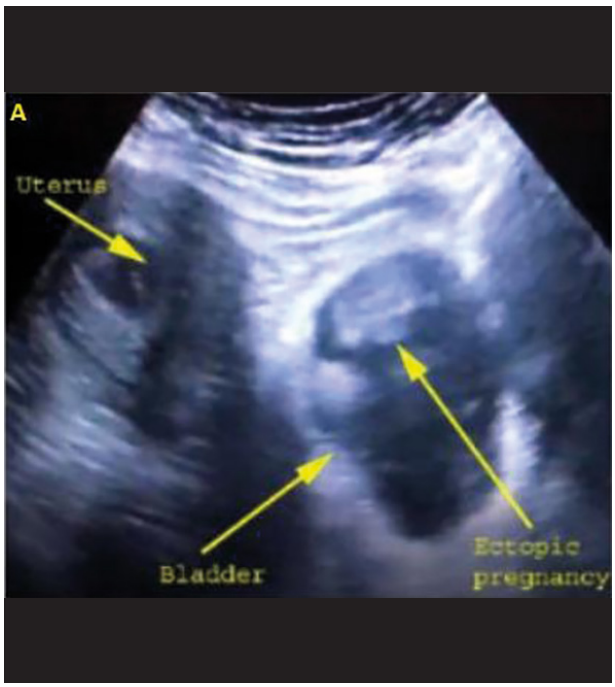

Figure 1.A: Ultrasonographic view of intravesical ectopic gestational sac.

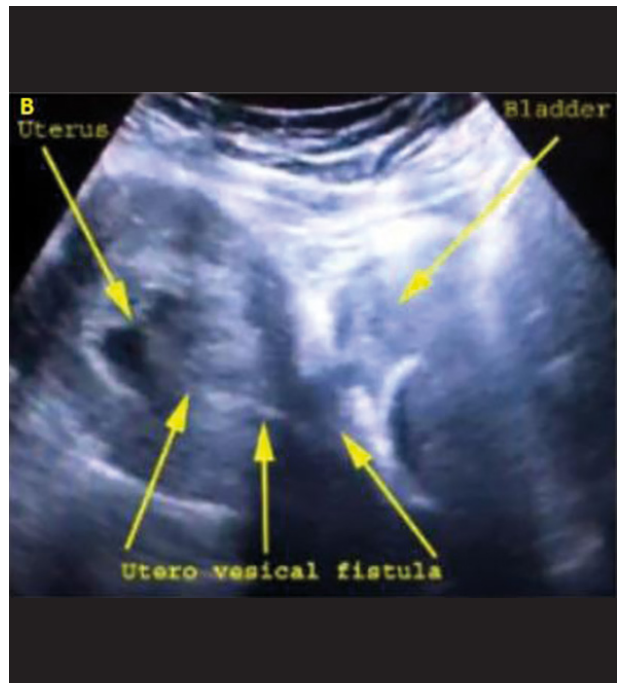

Figure 1.B: Ultrasogographic view of the uterovesical fistula tract.

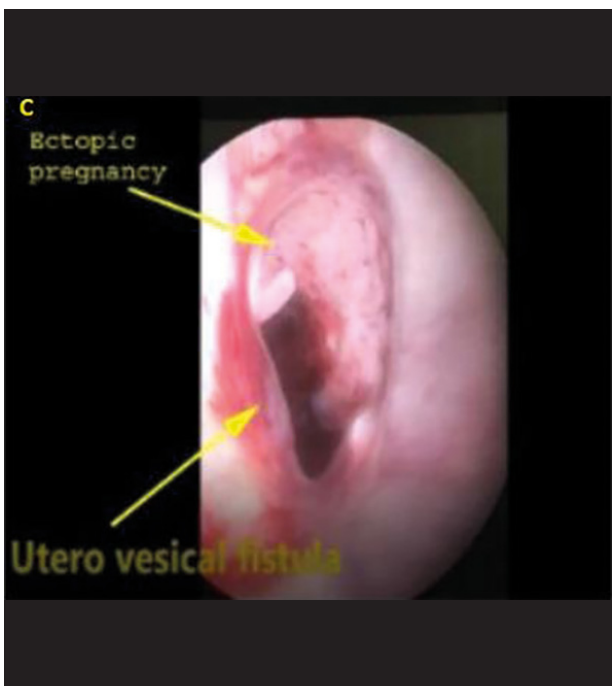

Figure 1.C: Cytoscopic view of the intravesical ectopic gestational sac.

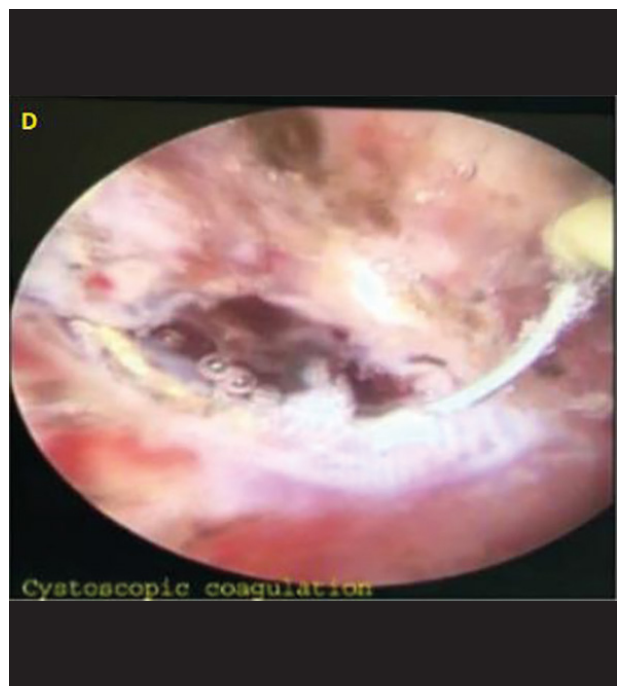

Figure 1.D: Resection of the intravesical ectopic gestational sac and coagulation of the uterovesical fistula tract.

eral weeks. In a study by Armstrong et al. intravesical ectopic pregnancies can also be seen in later weeks, such as the 20-weeks-case (9).

Early intervention is required as soon as vesicouterine fistulas are diagnosed. However, there are also studies suggesting that spontaneous fistulas may close spontaneously and surgical intervention may be delayed for several months (8). In addition, in a study by Jóźwik, it was evaluated that there were many cases that closed spontaneously with bladder drainage or hormonal therapy (10). We also managed our case in a similar way and observed that it was closed spontaneously.

CONCLUSION

As a conclusion, ectopic pregnancy should be one of the diagnoses that should be kept in mind in the differential diagnosis of patients with a history of pelvic surgery who present with complaints of menstrual delay and hematuria.

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Conflict of Interest

All authors declared that there is no conflict of interest.

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Author Contributions

Conception and design; AT, Aİ, Data acquisition; AT, ESP, Data analysis and interpretation; MD, İY, Drafting the manuscript; AT, BK, HÇ, Critical revision of the manuscript for scientific and factual content; ESP, BK, Statistical Analysis; Aİ, MD, Supervision; İY, HÇ.

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Address: Eurasian Urooncological Association,
Istanbul St. Yenimahalle Mah. Kosk Apt. N:113/A
Bakırkoy / Istanbul
Phone: +90 (533) 726 72 55
Web: www.avrasyauroonkoloji.org
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PREPARATION OF MANUSCRIPT

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If the content of the paper has been presented before, and if the summary has been published, the time and place of the conference should be denoted on this page.

If any grants or other financial support has been given by any institutions or firms for the study, information must be provided by the authors.

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The articles should be written with double-spaced in 12-point, Times New Roman character and at least 2.5 cm from all edges of each page. The main text should not contain any information about the authors' names and affiliations. On the first page (both Turkish and English) title, abstract and keywords should be given.

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Original articles should have a structured English (Objective, Material and Methods, Results, Conclusion) and Turkish (Amaç, Gereç ve Yöntemler, Bulgular, Sonuç) abstract. Review articles and case reports should have an unstructured abstract. Articles and abstracts should be written in accordance with the word limits specified in the table. References, tables and citations should not be used in an abstract.

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Type of Article	Abstract	Text (Word)	References	Table	Figure
Original Article	250 Structured	3000	30	6	5
Review Article	250 Unstructured	4000	50	6	5
Case Reports	250 Unstructured	2000	10	1	3
Letter to the Editor	No abstract	1000	5	1	1

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- Material and Methods
- Results
- Discussion
- Conclusions
- Figures and Tables Legend
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Article in journal: Tasci A, Tugcu V, Ozbay B, et al. Stone formation in prostatic urethra after potassium-titanyl-phosphate laser ablation of the prostate for benign prostatic hyperplasia. J Endourol. 2009;23:1879-1881.

For Books: Günalp İ. Modern Üroloji. Ankara: Yargıçoğlu Matbaası, 1975.

Chapters in books: Anderson JL, Muhlestein JB. Extra corporeal ureteric stenting during laparoscopic pyeloplasty. Philadelphia: W.B. Saunders, 2003; p. 288-307.

For website; Gaudin S. How moon landing changed technology history [serial online]. 2009 [cited 2014 June 15]. Available from: http://www.computerworlduk.com/in-depth/it-business/2387/how-moon-landing-changed-technology-history/

For conference proceeding; Anderson JC. Current status of chorion villus biopsy. Paper presented at: APSB 1986. Proceedings of the 4th Congress of the Australian Perinatal Society, Mothers and Babies; 1986 Sep 8-10; Queensland, Australian. Berlin: Springer; 1986. p. 182-191.

For Thesis; Ercan S. Venöz yetmezlikli hastalarda kalf kası egzersizlerinin venöz fonksiyona ve kas gücüne etkisi. Süleyman Demirel Üniversitesi Tıp Fakültesi Spor Hekimliği Anabilim Dalı Uzmanlık Tezi. Isparta: Süleyman Demirel Üniversitesi; 2016.

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PEER REVIEW PROCESS

The Double-Blind Peer Review Process

1. Submission of Paper

The corresponding author submits the paper via Dergipark online system to the journal (http://dergipark.gov.tr/journal/1455/submission/start).

2. Editorial Office Assessment

Editorial Office checks the paper's composition and arrangement against the journal's Author Guidelines to make sure it includes the required sections and stylizations. The quality of the paper is not assessed at this point.

3. Appraisal by the Editor-in-Chief

The Editor-in-Chief assigns submission to Section Editor to see through the editorial process. Section Editor checks that the paper is appropriate for the journal and is sufficiently original and interesting. If not, the paper may be rejected without being reviewed any further.

4. Invitation to Reviewers

The Section Editor sends invitations to individuals he or she believes would be appropriate reviewers. As responses are received, further invitations are issued, if necessary, until the required number of acceptances is obtained – commonly this is 2.

5. Response to Invitations

Potential reviewers consider the invitation as anonymous against their own expertise, conflicts of interest and availability. They then accept or decline. If possible, when declining, they might also suggest alternative reviewers.

6. Review is Conducted

The reviewer sets time aside to read the paper several times. The first read is used to form an initial impression of the work. If major problems are found at this stage, the reviewer may feel comfortable rejecting the paper with-out further work. Otherwise they will read the paper several more times, taking notes so as to build a detailed point-by-point review. The review is then submitted to the journal, with a recommendation to accept or reject it – or else with a request for revision (usually flagged as either major or minor) before it is reconsidered.

7. Journal Evaluates the Reviews

The Section Editor considers all the returned reviews before making an overall decision. If the reviews differ widely, the editor may invite an additional reviewer so as to get an extra opinion before making a decision.

8. The Decision is Communicated

The Section Editor sends a decision email to the author including any relevant reviewer comments as anonymous.

9. Next Steps

If accepted, the paper is sent to language Editor. If the article is rejected or sent back for either major or minor revision, the Section Editor should include constructive comments from the reviewers to help the author improve the article. At this point, reviewers should also be sent an email or letter letting them know the outcome of their review. If the paper was sent back for revision, the reviewers should expect to receive a new version, unless they have opted out of further participation. However, where only minor changes were requested this follow-up re-view might be done by the Section Editor.

- After these;
- Copyedit submission
- Layout
- Corrections
- Publishing the submissions on the web page as early print
- Creating issues
- Organize Table of Contents
- Publishing the issue on the web page and printing hardcopy.

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Referanslar:
1. Lepor et al, Long-Term Evaluation of Tamsulosin in BPH: Placebo- Controlled, Double-blind extension of Phase III trial. UROLOGY, 51: 901–906, 1998,
2. Tamprost MR Kısa Ürün Bilgisi,
3. Rahardjo et al, International Journal of Urology (2006) 13, 1405–1409,
4. Neurourology and Urodynamics 29:1276–1281 (2010)

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Referanslar:
1. Xatral XL Kısa Ürün Bilgisi
2. Van Kerrebroeck P. et al. Eur. Urol. 2000; 37: 306-313.
3. Van Moorselaar LUTS and sexual dysfunction: indications for management for BPH European 2003 Urology Supplement 2;13-20

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