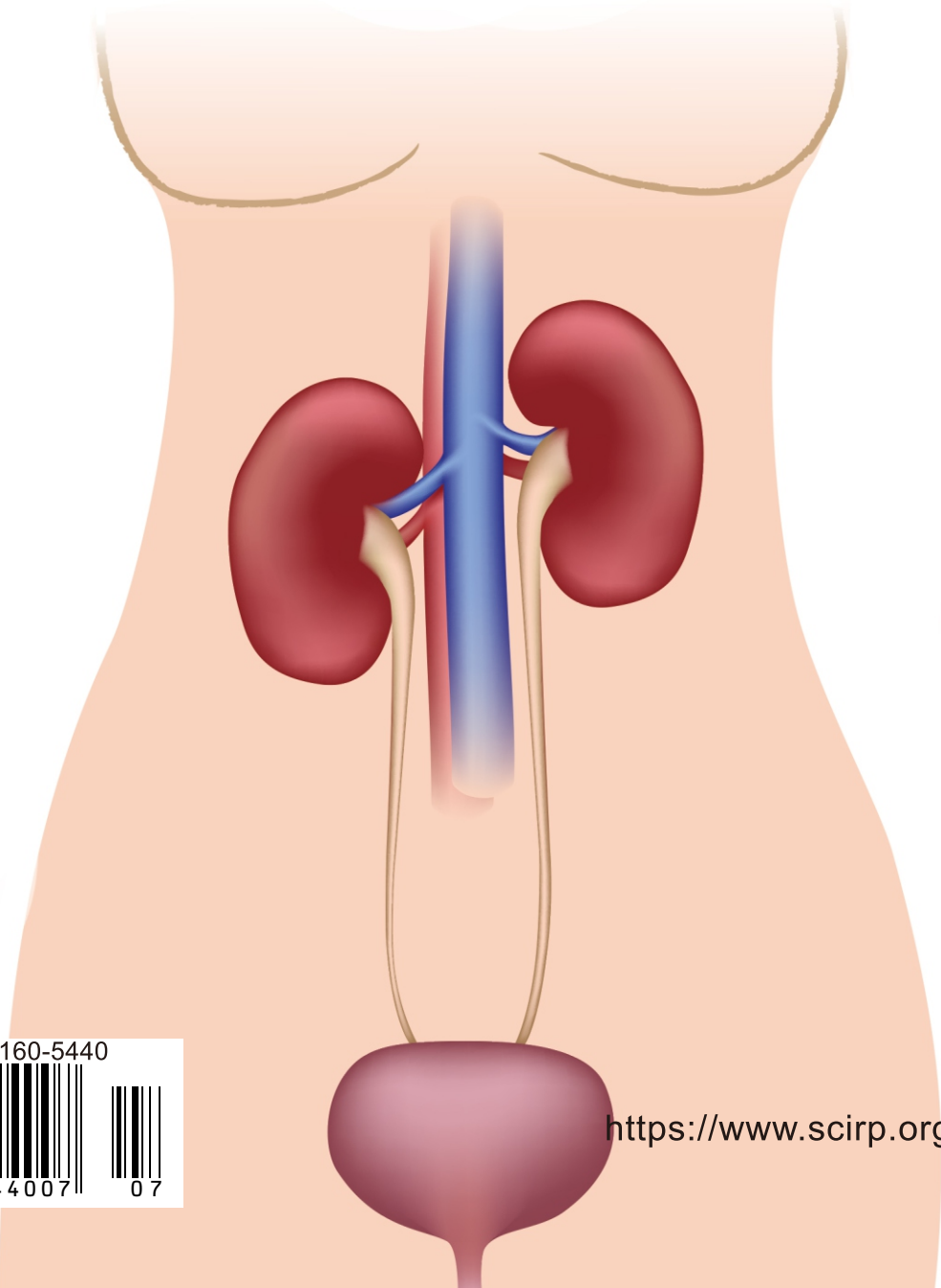


Open Journal of Urology



ISSN: 2160-5440



<https://www.scirp.org/journal/oju>

Journal Editorial Board

ISSN 2160-5440 (Print) ISSN 2160-5629 (Online)

<https://www.scirp.org/journal/oju>

Editor-in-Chief

Dr. Phillip Mucksavage University of Pennsylvania, USA

Executive Editor-in-Chief

Dr. Robert Daniel Moore Atlanta Center for Laparoscopic Urogynecology, USA

Editorial Board

Prof. Hideyuki Akaza The University of Tokyo, Japan
Dr. Daniele Amparore University of Turin, Italy
Dr. Hemant Kumar Bid The Research Institute at Nationwide Children's Hospital, USA
Prof. Alessandro Calisti San Camillo Hospital of Rome, Italy
Prof. Sung-Goo Chang Kyung Hee University Medical Center, South Korea
Prof. Piergiuseppe Colombo University of Milan, Italy
Dr. Xiao Gu Le Bonheur Children's Medical Center, USA
Prof. Samy L Habib The University of Texas Health Science Center at San Antonio, USA
Prof. Sarel Halachmi Israel Institute of Technology, Israel
Prof. Kyu-Sung Lee Sungkyunkwan University, South Korea
Prof. Yuanyuan Liang University of Texas Health Science Center at San Antonio, USA
Dr. Bashir A. Lwaleed Istanbul University, Turkey
Prof. Evangelos M. Mazaris St. Mary's and Charing Cross Hospital, Greece
Dr. Chong-Xian Pan University of California Davis Cancer Center, USA
Prof. Jose Enrique Robles University of Navarra, Spain
Prof. Charles Joel Rosser University of Central Florida, USA
Dr. Di Francesco Simona People's University Nicolaus Copernicus, Italy
Dr. Scott W. Smilen New York University, USA
Prof. Dingwei Ye Fudan University Cancer Hospital, China
Prof. Stanley Zaslau West Virginia University, USA

Table of Contents

Volume 12 Number 7

July 2022

Effectiveness, Safety and Satisfaction in Teleurology

T. B. Junior, M. K. F. Albeny, I. J. C. De Lima, G. B. P. De Brit, M. C. Albuquerque Neto, F. O. Vilar.....383

Twisting of the Spermatic Cord in an Elderly Subject at the Yaounde Central Hospital:

About a Case

J. C. Fouda, J. B. M. Mekeme, P. F. Owon'Abessolo, M. D. C. Biyouma, R. Allo, A. S. N. Makon,
F. G. N. Epoupa, L. O. Mbouche, C. M. Dongmo, A. A. Mbassi, M. Hell, P. J. Fouda, A. Essomba.....394

Surgical Haematuria: An Analysis of Causes in a Southern Nigerian State

V. O. Ofuru, V. Abhulimen.....401

Open Journal of Urology (OJU)

Journal Information

SUBSCRIPTIONS

The *Open Journal of Urology* (Online at Scientific Research Publishing, <https://www.scirp.org/>) is published monthly by Scientific Research Publishing, Inc., USA.

Subscription rates:

Print: \$79 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: sub@scirp.org

SERVICES

Advertisements

Advertisement Sales Department, E-mail: service@scirp.org

Reprints (minimum quantity 100 copies)

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: sub@scirp.org

COPYRIGHT

Copyright and reuse rights for the front matter of the journal:

Copyright © 2022 by Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY).

<http://creativecommons.org/licenses/by/4.0/>

Copyright for individual papers of the journal:

Copyright © 2022 by author(s) and Scientific Research Publishing Inc.

Reuse rights for individual papers:

Note: At SCIRP authors can choose between CC BY and CC BY-NC. Please consult each paper for its reuse rights.

Disclaimer of liability

Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:

E-mail: aju@scirp.org

Effectiveness, Safety and Satisfaction in Teleurology

Thome Barros Junior¹, Marcos Kalaf Farah Albeny², Igor José Caetano De Lima²,
Guilherme Bastos Palitot De Brit², Moacir Cavalcante De Albuquerque Neto²,
Fábio Oliveira Vilar²

¹Federal University of Pernambuco, Recife, Brazil

²Hospital of Clinics of Federal University of Pernambuco, Recife, Brazil

Email: thomepinheirojr@gmail.com, marcos_kfa@hotmail.com, igor.jcl@gmail.com, palitot.guilherme@gmail.com, moacircavalcante@hotmail.com, foliveiravilar@hotmail.com

How to cite this paper: Junior, T.B., Albeny, M.K.F., De Lima, I.J.C., De Brit, G.B.P., Albuquerque Neto, M.C. and Vilar, F.O. (2022) Effectiveness, Safety and Satisfaction in Teleurology. *Open Journal of Urology*, 12, 383-393.

<https://doi.org/10.4236/oju.2022.127037>

Received: June 2, 2022

Accepted: July 15, 2022

Published: July 18, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Telemedicine has been used as a tool for improving access to health services worldwide. The aim of the present study is thus to evaluate the effectiveness of urological consultation by videoconference, perceptions regarding safety on the part of medical teams providing video consultation services and patient satisfaction after a urological appointment. **Materials and Methods:** A cross-sectional, observational, and analytical study was carried out with 50 volunteers referred from the basic health unit for a urology appointment. All patients were evaluated remotely by videoconference and in person by different urology teams. **Results:** The study revealed that effectiveness in terms of the degree of match between diagnoses performed by video consultation and those performed in person was 92%. The urology team's perception regarding safety, measured using an in-house safety questionnaire, was high for both videoconferencing and in-person consultations and there was no statistical difference between the two (overall safety score for video consultation compared to in-person consultation was 9.7 ± 0.8 compared to 9.6 ± 0.8 and the p-value was 0.3 for Student's t-test). Patient satisfaction with the appointment was similarly high for both groups, averaging 9.72 ± 0.4 among patients who attended a video consultation and 9.82 ± 0.4 among those whose consultation was conducted in person, with a p-value of 0.10478 for Student's t-test. **Conclusion:** Video consultation in urology is an effective way to perform diagnoses, with high levels of perceived safety among urologists and high satisfaction rates among patients.

Keywords

Urology, Telemedicine, Telecommunications, Appointments and Schedules

1. Introduction

The world health organization (WHO) believes that telemedicine has a role to play in improving access to health services around the world [1]. Telemedicine, or telehealth, refers to any kind of health service provided at a distance, aided by information technology tools, and has been used in many parts of the world, mainly in developed countries [2]. Videoconferencing consultation is one of the telemedicine modalities that most closely resembles an in-person consultation using widely available telecommunication tools such as a smartphone or a portable computer. Despite countless benefits, there is still great resistance among health service providers related to the quality and safety of the information shared, the weakening of the doctor-patient relationship [3], inadequate government oversight, and doubts regarding remuneration for services provided [4] [5].

The SARS-COV-2 pandemic and the need for social isolation have made videoconferencing a safe alternative for bringing people together. Within the health services, this tool has emerged as a way of enabling health services to be resumed both for people with COVID-19 and for those with other conditions requiring care [6]. Video consultation as a telemedicine tool has been introduced in different ways in different countries owing to the peculiar features of different health service regulation agencies around the world [7]. Although telemedicine has been subject to regulation since the 1970s in Brazil, the prescription of treatments and complementary tests by way of telemedicine only received authorization in 2020 as a result of the SARS-COV-2 pandemic [8].

Video consultations have been employed in a variety of different scenarios and specialties. In urology, a number of experiences have been published that demonstrate that remote consultations have been adopted as institutional policy in a manner similar to in-person consultations regardless of the patient's profile [9]. There are also published accounts of such experiences in relation to the management of prostate cancer [10] [11], urinary incontinence [12], urinary infection, hematuria [13], urinary lithiasis [14] [15], benign prostatic hyperplasia and lower urinary tract symptoms [16], erectile and ejaculation dysfunction [17], and in the field of pediatric urology [18] [19].

The Federal University of Pernambuco's Hospital das Clínicas has been providing remote health services through RedeNUTES since 2003. RedeNUTES provides tele-education, teleconsultation, tediagnosis and remote tracking services [20]. The urology department at HC-UFPE has a broad-ranging accumulation of experience in telementoring for surgical procedures [21] and urodynamic studies [22] [23]. In a highly populous country of continental dimensions, such as Brazil, video consultations can play an important role in improving access to health services. Information on efficiency, safety and patient satisfaction with regard to such consultations in urology is essential for their introduction into routine care.

2. Materials and Methods

After ethical board approved, a cross-sectional, analytical, descriptive study was carried out with 50 patients referred from primary health care units for urology care, this being the only selection criterion. The sample size calculation was performed using the formula proposed by Zar to compare the proportions of the same population [24]. A maximum error of 10% and a confidence level of 90% were considered, suggesting the minimum sample of 41 individuals however for this research we increased the number to 50. Patients were invited to attend a urological appointment by video consultation before or after an in-person consultation at the urological service of the Federal University of Pernambuco in November 2021. The two appointments were conducted by different urology teams, each comprising one medical resident and one preceptor. To reduce selection bias, half of the patients first received an in-person consultation followed by a remote consultation via videoconference, while the other half first received a videoconference consultation and then attended in person. In an attempt to minimize the influence of the first consultation, the interval between the appointments did not exceed one week. The urological staff were given full autonomy in conducting consultations and allowed to employ auxiliary tools such as symptom questionnaires, a voiding diary, and the like. At the end of the consultation, the urological team filled out an in-house safety questionnaire and the patients answered a question about satisfaction.

Diagnoses were tabulated and compared between the groups and categorized as: 1) a complete match: when all the patients' diagnoses were the same; 2) a partial match: when at least one diagnosis was the same; and 3) no match: when the diagnoses were different. The care provider's perceptions regarding safety were assessed using a two-question questionnaire designed by the researchers to ask about the safety of diagnoses performed and medical decisions taken. The answers were ranked on a Likert scale from 1 to 5 and the sum of the two responses, ranging from 2 to 10, provided the overall safety index (Figure 1).

Patient satisfaction was assessed using the Net Promoter Score (NPS), a tool used to measure the satisfaction and loyalty of users regarding any service provided [25]. Patients were asked the following question: on a scale of 0 to 10,

<p>Question 1: <i>How safe do you feel the diagnoses performed during this appointment were?</i></p> <p>(1) Totally unsafe (2) Partially unsafe (3) indifferent (4) Partially safe (5) Totally safe</p>	Score 1
<p>Questions 2: <i>How safe do you feel the medical decisions taken in this appointment were?</i></p> <p>(1) Totally unsafe (2) Partially unsafe (3) indifferent (4) Partially safe (5) Totally safe</p>	Score 2
<p>Overall safety index (sum of score 1 and 2)</p>	

Figure 1. Urological team in-house safety questionnaire.

based on your experience of this medical appointment as a whole, how likely would you be to recommend this form of medical care to a friend or colleague (Figure 2)? The NPS provides users with a range of options regarding satisfaction with and loyalty to the service provided ranging from 0 to 10 and these are then grouped into three classes: promoters (for responses of 9 or 10 on the scale); indifferent or neutral (for scores of 7 to 8); and detractors (for scores of 0 to 6) [26].

Categorical variables were described in proportions and tested by the chi-square method. Numerical variables were described as means and tested using the T-student.

3. Results

Fifty patients, 35 male and 15 female, were included in the present study. Their ages ranged from 18 to 84 years and the average age was 52.8 ± 14 years. Twenty-four patients had concluded high school (48%), 16 had concluded elementary school (32%), five (10%) held university degrees, and 10% (5 patients) had received no schooling at all.

Thirty-eight of the patients attended via video consultation and 37 of those attended in person received only one diagnosis; 12 patients in both groups received two diagnoses and one patient attended in person received 3 diagnoses. Sixty-four diagnoses provided via in-person consultation and 62 by video consultation for the same 50 patients. The diagnoses matched to some degree in 46 patients (92%), matching fully in thirty-nine patients (78%) and partially in seven (14%). The diagnoses failed to match in four patients (8%).

Evaluation of the medical decisions taken during the consultations provided the following information. Twenty-two of the patients (44%) received some kind of guidance regarding hygiene, diet or behavior; complementary tests were requested from 16 (32%); and 10 (20%) had some medication prescribed when attended by videoconference. In the in-person consultations, on the other hand, forty-one (82%) patients received advice on hygiene, diet and/or behavior, complementary tests were requested for 35 (70%) and medication was prescribed in ten cases (20%). The proportion of patients receiving guidance on hygiene, diet or behavior and the proportion of those for whom complementary tests were requested were both higher when the same patients were attended in person and this difference was statistically significant (p-value = 0.00008 and 0.0001, respectively, using the chi-square test). However, the percentage receiving a prescription

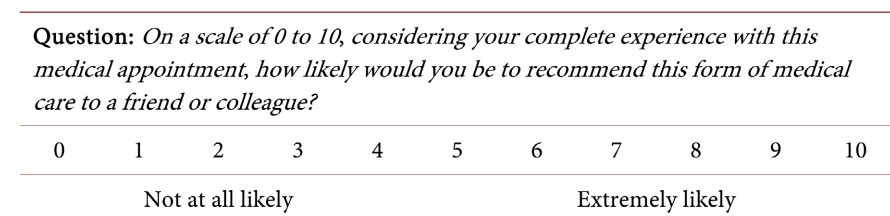


Figure 2. Patient’s satisfaction questionnaire.

for medication was no different when the same patient was seen by video consultation and in person (p-value = 0.24) (**Table 1**).

The average overall safety indices for the video and in-person consultation groups were 9.7 ± 0.8 and 9.6 ± 0.8 respectively, with a p-value of 0.3 for Student's t test. The averages for the diagnosis safety score and medical decisions safety score were 4.8 ± 0.4 and 4.7 ± 0.5 , with a p-value of 0.2, and 4.8 ± 0.3 and 4.9 ± 0.4 , with a p-value of 0.3, respectively, neither being statistically different according to Student's t test (**Table 2**).

Table 1. Results-epidemiology, schooling, effectiveness on diagnoses and medical decision.

Patients (n)	50		
Male Gender (%)	35 (70%)		
Age-years (av \pm sd)	52.8 ± 14		
(min-max)	(18 - 84)		
Level of Schooling	None	5 (10%)	
	Elementary school	16 (32%)	
	High school	24 (48%)	
	University degree	5 (10%)	
Number of diagnoses performed by video and in-person			
Diagnosis rate	Video consultation	In-person	
1) Diagnoses/patient	38	37	
2) Diagnoses/patient	12	12	
3) Diagnoses/patient	0	3	
Total (diagnoses/group)	62	64	
Diagnosis match rates			
Complete match	39 (78%)		
Partial match	7 (14%)		
No match	4 (8%)		
Comparison of medical decisions taken during video and in-person consultations			
	Video consultation	In-person	p-value
Guidance on behavior, hygiene or diet n (%)	22 (44%)	41 (82%)	0.00008
Complementary tests requested n (%)	16 (32%)	35 (70%)	0.0001
Prescription of medication n (%)	10 (20%)	15 (30%)	0.24

The groups were statistically tested using chi-square.

Table 2. Results of safety questionnaire.

	Video consultation	In-person	Student's t test p-value
Overall safety index av ± sd	9.7 ± 0.8 (7 - 10)	9.6 ± 0.8 (6 - 10)	0.3
Diagnosis safety score av ± sd	4.8 ± 0.4 (3 - 5)	4.7 ± 0.5 (2 - 5)	0.2
Medical decision safety score av ± sd	4.8 ± 0.3 (3 - 5)	4.9 ± 0.4 (3 - 5)	0.3

The groups were statistically tested using student's t test.

The average score for patient satisfaction (NPS) was 9.72 ± 0.4 and 9.82 ± 0.4 for the video consultation group and in-person consultation group, respectively, and there was no statistical difference when compared using Student's t test (p-value = 0.10478). The results for the NPS applied to the volunteer patients showed that the majority were classified as promoters, with 92% and 98% giving a score of 9 or 10 in in-person and remote consultations, respectively; while 8% and 2% were classified as neutral or indifferent (providing a score of 7 or 8), and none provided a score of 6 or less (which would have classified them as detractors) for either form of consultation (**Table 3**).

4. Discussion

The present study covered patients with urological complaints referred from basic health units. Most were men in the fourth and fifth decades of life and with varying levels of schooling. This population was therefore broadly representative of a real situation at a tertiary urology service. A high degree of agreement was found between videoconference and in-person consultations regarding diagnosis and a similar rate of prescription of medications. However, patients attended in person were more likely to receive guidance regarding hygiene, diet and behavior and or to have complementary tests requested. Physicians perceived patient safety for both approaches to be high. Neither were there any statistically significant differences in their responses to an in-house safety questionnaire. Patients reported high levels of satisfaction irrespective of the approach adopted.

The high rate of agreement between the approaches with respect to diagnosis (92%) may reflect the effectiveness of the video consultation. These findings are similar to those of Chu *et al.*, who identified a 90% agreement rate between diagnoses made by videoconference and in person [9]. Likewise Sherwood *et al.*, who provided remote care for prison inmates, found a rate of agreement between diagnoses made by video consultation and in person of 90%, with a decrease in the need for in-person consultations. These authors thus estimate that 50% of urological complaints could be conducted exclusively through telemedicine [27]. No recommendations were provided regarding the standard methodology to be used for consultations, and medical teams thus had complete freedom

Table 3. Results for patient satisfaction according to NPS.

	Video consultation	In-person	p-Value
Promotor (answers 9 - 10)	46 (92%)	49 (98%)	
Neutral (answers 7 - 8)	4 (8%)	1 (2%)	
Detractor (answers 0 - 6)	0	0	
NPS (average \pm sd)	9.72 \pm 0.4	9.82 \pm 0.4	0.10478

The groups were statistically tested using student's t test.

and autonomy as to how to provide care, reinforcing the finding that video consultation and in-person consultations demonstrate similar efficacy in producing diagnoses.

The present study found a higher frequency for requesting complementary tests and guidelines when consultations were carried out in-person, as also observed by Mehrotra *et al.*, who compared the results of 99 online healthcare visits to 2855 in-person consultations of patients with urinary infection at the University Medical Center Pittsburgh [28]. In theory, the larger number of requests for complementary tests provides additional clinical information but increases the indirect costs associated with the consultation. More extensive provision of advice regarding hygiene, diet and behavior should, in theory, also enhance the perceived quality of in-person consultations and this element of video consultations thus needs to be improved. However, the relative paucity of studies of the behavior and attitudes of health professionals and patients in various care environments and the outcomes of these consultations does not enable any clear conclusion to be drawn by way of explanation of this result. The creation of protocols and flows of care based on scientific evidence may, however, make it possible to minimize the differences between these two forms of medical consultation.

Doctors were found to believe that the level of safety both of diagnoses and medical decisions was high. To evaluate this, a questionnaire was created containing two questions related to the perception of safety, with answers ranked on a 5-point Likert scale. This tool enabled us to identify medical teams whose ultimate perception of the quality of care necessitated an intervention to ensure a safer outcome and to investigate any possible lapses regarding safety. The perception of safety and satisfaction among service providers is a tool used in business to identify obstacles and resistance to internal processes [29]. Recently, robust questionnaires have been developed to evaluate the degree of applicability, satisfaction and quality regarding interaction in the doctor-patient relationship [30] [31]. The publication, translation, and cross-cultural adaptation of these questionnaires are important for standardizing research and building a larger

body of scientific evidence.

Patient satisfaction was assessed using the NPS, which measures users' satisfaction with and loyalty to service. Similarly, high rates of satisfaction were found for both video and in-person consultations, as observed in other studies that evaluated the satisfaction of patients in medical consultations for general urological complaints [9], in the management of prostate cancer [32], in the assessment of hematuria [33], in the management of urinary incontinence in elderly women [12] and in the psychotherapeutic management of erectile dysfunction and premature ejaculation [17]. The high overall satisfaction index may also be related to the sample of patients being composed exclusively of users of the Brazilian National Health System, who have poor access to health services and minimal choice. The limitations of the study are mainly related to the small sample size and the fact that it was developed in a single center.

Telemedicine is also an effective strategy for reducing waiting times for specialized consultations, as observed in another study in the south of Brazil [34]. It may also provide an alternative method for following up on patients treated in referral centers [35] and its use should be systematically extended throughout the Brazilian health care routine. Further studies of medical consultation by video conference in urology, nevertheless, need to be conducted before this tool can be universally applied.

5. Conclusion

Video consultation is a new tool in Brazil but has demonstrated similar effectiveness to that of in-person consultation in producing diagnoses. Physicians who performed consultations by videoconference were found to consider the level of safety of these consultations to be high and patients reported high levels of satisfaction with video consultation. Further studies need to be conducted as a way of laying the groundwork for improving and expanding the use of this kind of remote medical consultation.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] WHO (2011) Global Observatory for eHealth Series. Volume 3. New Horizons for Health through Mobile Technologies. Observatory.
- [2] Craig, J. and Patterson, V. (2005) Introduction to the Practice of Telemedicine. *Journal of Telemedicine and Telecare*, **11**, 3-9. <https://doi.org/10.1258/1357633053430494>
- [3] Hjelm, N.M. (2005) Benefits and Drawbacks of Telemedicine. *Journal of Telemedicine and Telecare*, **11**, 60-70. <https://doi.org/10.1258/1357633053499886>
- [4] Antoniotti, N.M., Drude, K.P. and Rowe, N. (2014) Private Payer Telehealth Reimbursement in the United States. *Telemed e-Health*, **20**, 539-543.

- <https://doi.org/10.1089/tmj.2013.0256>
- [5] Hollander, J.E. and Carr, B.G. (2020) Virtually Perfect? Telemedicine for Covid-19. *The New England Journal of Medicine*, **382**, 1679-1681. <https://doi.org/10.1056/NEJMp2003539>
- [6] WHO (2020) COVID-19 Significantly Impacts Health Services for Noncommunicable Diseases. <https://www.who.int/news-room/detail/01-06-2020-covid-19-significantly-impacts-health-services-for-noncommunicable-diseases>
- [7] De Varge Maldonado, J.M.S., Marques, A.B. and Cruz, A. (2016) Telemedicina: Desafios à sua difusão no Brasil. *Cadernos de Saúde Pública*, **32**, e00155615.
- [8] Official Letter Federal Council of Medicine of Brazil. CFM 1.756/2020. CFM 2020. https://portal.cfm.org.br/images/PDF/2020_oficio_telemedicina.pdf
- [9] Chu, S., Boxer, R., Madison, P., Kleinman, L., Skolarus, T., Altman, L., *et al.* (2015) Veterans Affairs Telemedicine: Bringing Urologic Care to Remote Clinics. *Urology*, **86**, 255-260. <https://doi.org/10.1016/j.urology.2015.04.038>
- [10] Viers, B.R., Lightner, D.J., Rivera, M.E., Tollefson, M., Boorjian, S.A., Karnes, R.J., *et al.* (2015) Efficiency, Satisfaction, and Costs for Remote Video Visits Following Radical Prostatectomy: A Randomized Controlled Trial. *European Urology*, **68**, 729-735. <https://doi.org/10.1016/j.eururo.2015.04.002>
- [11] Galsky, M.D., Shahin, M., Jia, R., Shaffer, D.R., Gimpel-Tetra, K., Tsao, C.-K., *et al.* (2017) Telemedicine-Enabled Clinical Trial of Metformin in Patients with Prostate Cancer. *JCO Clinical Cancer Informatics*, **1**, 1-10. <https://doi.org/10.1200/CCI.17.00044>
- [12] Hui, E., Lee, P.S.C. and Woo, J. (2006) Management of Urinary Incontinence in Older Women Using Videoconferencing versus Conventional Management: A Randomized Controlled Trial. *Journal of Telemedicine and Telecare*, **12**, 343-347. <https://doi.org/10.1258/135763306778682413>
- [13] Zholudev, V., *et al.* (2017) Cost Analysis for Initial Evaluation of Hematuria: Impact of TELE-Urology Clinics. *Journal of Urology*, **197**, e416.
- [14] Gasparini, M.E., Chang, T.W., St Lezin, M., Skerry, J.E., Chan, A. and Ramaswamy, K.A. (2019) Feasibility of a Telemedicine-Administered, Pharmacist-Staffed, Protocol-Driven, Multicenter Program for Kidney Stone Prevention in a Large Integrated Health Care System: Results of a Pilot Program. *The Permanente Journal*, **23**, 1-5.
- [15] Connor, M.J., Miah, S., Edison, M.A., Brittain, J., Smith, M.K., Hanna, M., *et al.* (2019) Clinical, Fiscal and Environmental Benefits of a Specialist-Led Virtual Ureteric Colic Clinic: A Prospective Study. *BJU International*, **124**, 1034-1039. <https://doi.org/10.1111/bju.14847>
- [16] Park, M.S., Ha, Y.S., Lee, K.M., Kim, W.J. and Lee, H.L. (2006) The Distant Management System of BPH Patients Using the Tele-Communications. *Korean Journal of Urology*, **47**, 489-492. <https://doi.org/10.4111/kju.2006.47.5.489>
- [17] van Lankveld, J., Leusink, P., Van Diest, S., Gijs, L. and Slob, A.K. (2009) Internet-Based Brief Sex Therapy for Heterosexual Men with Sexual Dysfunctions: A Randomized Controlled Pilot Trial. *The Journal of Sexual Medicine*, **6**, 2224-2236. <https://doi.org/10.1111/j.1743-6109.2009.01321.x>
- [18] Finkelstein, J.B., Nelson, C.P. and Estrada, C.R. (2020) "Ramping up Telemedicine in Pediatric Urology—Tips for Using a New Modality. *Journal of Pediatric Urology*, **16**, 288-289. <https://doi.org/10.1016/j.jpuro.2020.04.010>
- [19] Novara, G., Checcucci, E., Crestani, A., Abrate, A., Esperto, F., Pavan, N., *et al.* (2020)

- Telehealth in Urology: A Systematic Review of the Literature. How Much Can Telemedicine Be Useful during and after the COVID-19 Pandemic? *European Urology*, **78**, 786-811. <https://doi.org/10.1016/j.eururo.2020.06.025>
- [20] Diniz, P.R.B., Ribeiro Sales, F.J. and De Araújo Novaes, M. (2016) Providing Telehealth Services to a Public Primary Care Network: The Experience of RedeNUTES in Pernambuco, Brazil. *Telemed e-Health*, **22**, 694-698. <https://doi.org/10.1089/tmj.2015.0209>
- [21] Rodrigues Netto, N., *et al.* (2003) Telementoring between Brazil and the United States: Initial Experience. *Journal of Endourology*, **17**, 217-220.
- [22] Lima, S.V.C., de Vilar, F.O., Lustosa, E.S., de Souza, C.A., de Barros, E.G.C. and Cavalcanti, S.G. (2010) Remote Access for Teaching and Reporting Urodynamics: Use of Smartphones. *UroToday International Journal*, **3**, 1944-5784. <https://doi.org/10.3834/uij.1944-5784.2010.12.02>
- [23] Lima, S.V.C., de Vilar, F.O., de Carvalho, L.H.F., Bezerra, J.A.D. and de Souza, C.A. (2008) Telementoring in Urodynamics: Initial Experience. *UroToday International Journal*, **1**, 1939-4810. <https://doi.org/10.3834/uij.1939-4810.2008.07.04>
- [24] Callegari-Jacques, S.M. (2003) Bioestatística: Princípios e aplicações. Editora Artmed, Porto Alegre.
- [25] Krol, M.W., de Boer, D., Delnoij, D.M. and Rademakers, J. (2015) The Net Promoter Score—An Asset to Patient Experience Surveys? *Health Expectations*, **18**, 3099-3109. <https://doi.org/10.1111/hex.12297>
- [26] Rajasekaran, M.N. and Dinesh, M.N. (2018) How Net Promoter score Relates to Organizational Growth. *International Journal of Creative Research Thoughts*, **6**, 927-981.
- [27] Sherwood, B.G., Han, Y., Nepple, K.G. and Erickson, B.A. (2018) Evaluating the Effectiveness, Efficiency and Safety of Telemedicine for Urological Care in the Male Prisoner Population. *Urology Practice*, **5**, 44-51. <https://doi.org/10.1016/j.urpr.2017.01.001>
- [28] Mehrotra, A., Paone, S., Martich, G.D., Albert, S.M. and Shevchik, G.J. (2013) A Comparison of Care at E-Visits and Physician Office Visits for Sinusitis and Urinary Tract Infection. *JAMA Internal Medicine*, **173**, 72-74. <https://doi.org/10.1001/2013.jamainternmed.305>
- [29] Matthies-Baraibar, C., Arcelay-Salazar, A., Cantero-González, D., Colina-Alonso, A., García-Urbaneja, M., González-Llinares, R.M., *et al.* (2014) Is Organizational Progress in the EFQM Model Related to Employee Satisfaction? *BMC Health Services Research*, **14**, 468. <https://doi.org/10.1186/1472-6963-14-468>
- [30] Yip, M.P., Chang, A.M., Chan, J. and Mackenzie, A.E. (2003) Development of the Telemedicine Satisfaction Questionnaire to Evaluate Patient Satisfaction with Telemedicine: A Preliminary Study. *Journal of Telemedicine and Telecare*, **9**, 46-50. <https://doi.org/10.1258/13576330321159693>
- [31] Parmanto, B., Lewis, A.N., Graham, K.M. and Bertolet, M.H. (2016) Development of the Telehealth Usability Questionnaire (TUQ). *International Journal of Telerehabilitation*, **8**, 3-10. <https://doi.org/10.5195/ijt.2016.6196>
- [32] Leahy, M., Krishnasamy, M., Herschtal, A., Bressel, M., Dryden, T., Tai, K.H., *et al.* (2013) Satisfaction with Nurse-Led Telephone Follow up for Low to Intermediate Risk Prostate Cancer Patients Treated with Radical Radiotherapy. A Comparative Study. *The European Journal of Oncology Nursing*, **172**, 162-169. <https://doi.org/10.1016/j.ejon.2012.04.003>
- [33] Safir, I.J., Gabale, S., David, S.A., Huang, J.H., Gerhard, R.S., Pearl, J., *et al.* (2016) Implementation of a Tele-Urology Program for Outpatient Hematuria Referrals:

Initial Results and Patient Satisfaction. *Urology*, **97**, 33-39.

<https://doi.org/10.1016/j.urology.2016.04.066>

- [34] Pfeil, J.N., Rados, D.V., Roman, R., Katz, N., Nunes, L.N., Vigo, Á., *et al.* (2020) A Telemedicine Strategy to Reduce Waiting Lists and Time to Specialist Care: A Retrospective Cohort Study. *Journal of Telemedicine and Telecare*, 1-8.
<https://doi.org/10.1177/1357633X20963935>
- [35] Pathni, R.K., Satpathy, S. and Kailash, S. (2009) Need for Tele Follow-Up—A Study at a Public Sector Quaternary Referral Hospital in India. *Journal of Telemedicine and Telecare*, **15**, 255-259. <https://doi.org/10.1258/jtt.2009.081206>

Twisting of the Spermatic Cord in an Elderly Subject at the Yaounde Central Hospital: About a Case

Jean Cedrick Fouda^{1,2}, Junior Barthelemy Mekeme Mekeme^{1,2}, Philip Fernandez Owon'Abessolo^{1,3}, Marcella Derboise Christelle Biyouma², Ranibel Allo², Axel Stephane Nwaha Makon², Frantz Guy Ngalle Epoupa², Landry Oriole Mbouche², Cedric Mayopa Dongmo², Achille Aurèle Mbassi^{1,3}, Medjo Hell⁴, Pierre Joseph Fouda^{1,2}, Arthur Essomba²

¹Yaounde Central Hospital, Yaounde, Cameroon

²University of Yaounde I, Yaounde, Cameroon

³University of Douala, Douala, Cameroon

⁴Private Hospital, Cameroon

Email: cedrickfouda@gmail.com

How to cite this paper: Fouda, J.C., Mekeme, J.B.M., Owon'Abessolo, P.F., Biyouma, M.D.C., Allo, R., Makon, A.S.N., Epoupa, F.G.N., Mbouche, L.O., Dongmo, C.M., Mbassi, A.A., Hell, M., Fouda, P.J. and Essomba, A. (2022) Twisting of the Spermatic Cord in an Elderly Subject at the Yaounde Central Hospital: About a Case. *Open Journal of Urology*, 12, 394-400.

<https://doi.org/10.4236/oju.2022.127038>

Received: April 30, 2022

Accepted: July 15, 2022

Published: July 18, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Twisting of the spermatic cord is part of urological emergencies. It can occur at any age with a predilection for children and adolescents. There is no literature on spermatic cord torsion in octogenarians, probably due to its rarity. The majority of recent studies show spermatic cord torsion in patients under 55 years of age. This is why we present a case of spermatic cord torsion in an 80 years old subject. **Case Presentation:** We present a case of torsion of the spermatic cord in an 80-year-old subject. The diagnosis was made on anamnestic and clinical grounds. The patient presented with scrotal pain, unilateral, of sudden onset, violent intensity without urinary signs with an ascended testicle. The urine dipstick was unremarkable. Management was done surgically and as an emergency. The postoperative course was satisfactory. **Conclusion:** Spermatic cord torsion in octogenarians is exceptional and should be suspected in the first instance in the presence of any sudden onset, severe testicular pain without urinary signs with an ascended testicle and a negative urine dipstick.

Keywords

Twisting of the Spermatic Cord, 80-Year-Old Subject, Diagnostic, Emergency

1. Introduction

The twisting of the spermatic cord is a urological emergency. It is due to a rota-

tion of the testicle on its vascular-nervous axis resulting in a partial or permanent cessation of blood flow. It quickly brings into play the functional and vital prognosis of the gland. New-borns, children and adolescents are the most exposed [1] [2]. The torsion is most often unilateral [3]. There is no literature on spermatic cord torsion in octogenarians, probably due to its rarity. The majority of recent studies show spermatic cord torsion in patients under 55 years of age [4] [5]. The case we report is that of a twist of the spermatic cord in an octogenarian subject

2. Case Presentation

Mr. AA, 80, a teacher by profession, had been seen for brutal right testicular pain while he was watching television. The history of the disease indicates the occurrence of pain a few minutes before the consultation, abrupt installation, without irradiation, dagger-like, intense, without lull factor, aggravated by palpation and accompanied by difficulty walking. He had no specific history and the patient had no particular voiding disorders and no history of recent unprotected intercourse. He does a regular annual check-up. He has not had questionable sex in the past six months. The physical examination made it possible to note a good general state, normo-colored mucous membranes, a flexible abdomen without palpable mass; the cardiovascular and pleuro-pulmonary examination was without pathological particularity. The hernia openings were free. The penis was normal in appearance. Examination of the testicles revealed a right testicle in the purses, there was an elevation and horizontalization of the testicle and pain was present when lifting the testicle. The cremasteric reflex was abolished. The testicle was sensitive. The scrotum was wrinkled and non-inflammatory. The left testicle was normal.

In total, we concluded that the spermatic cord was twisted in an 80-year-old subject. We had done a Doppler ultrasound which confirmed the existence of a twisted spermatic cord and a viable testicle (**Figure 1**). We performed a urine dipstick which was unremarkable. An operational assessment had been made and was within normal limits.

Surgically, we made an incision on the medial raphe and dissected the different parietal planes, thereby exposing the right testicle. We objectified a turn of the turn, the testicle was macroscopically normal but bluish in colour (**Figure 2**). We twisted and fixed the testicle to the wall with a 4/0 prolene at 3 a.m. and 9 a.m. the contralateral testicle was fixed in the same way. We then closed the scrotal wall.

The surgery was well tolerated by the patient. The post-operative course was simple and unremarkable. The patient was discharged three days later with a favourable evolution. The patient was seen again at two weeks, one and three months post-operatively. Examination of the testicle revealed a normal looking testicle.

3. Discussion

A brutal testicular pain occurring in an elderly subject can evoke a certain number

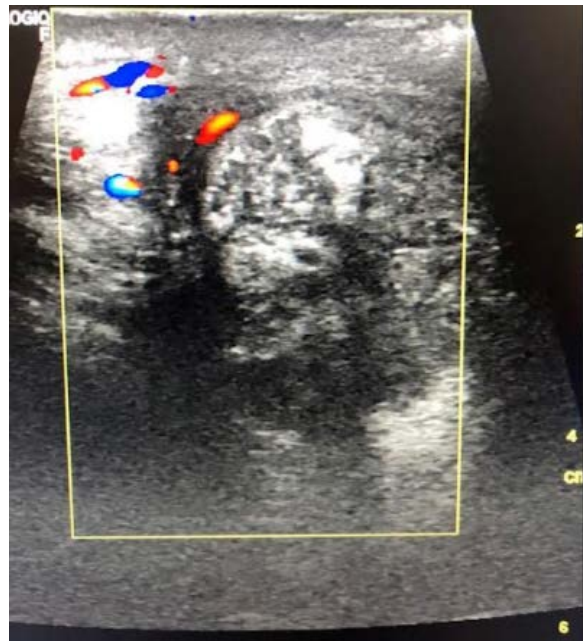


Figure 1. Existence of a twisted spermatic cord and a viable testicle.

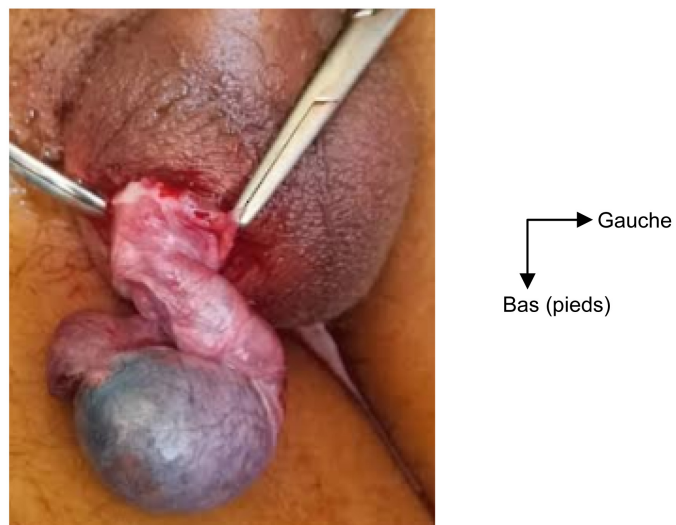


Figure 2. Torsion of the right testicle with testicle and epididymis in full pain but not necrotic (bluish appearance of the testicle).

of pathologies among which a strangulated inguino-scrotal hernia, a trauma, an acute orchiepidymitis, a testicular cancer revealing itself in an acute mode. Spermatic cord torsion remains an often overlooked diagnosis of acute scrotal pain in adults [6].

Testicular torsion is a surgical urological emergency. Hypoxia of the gland prolonged beyond six hours definitively compromises its function. Twisting of the spermatic cord can occur at any age but with predominance for those under 25 [1] [2] [7]. There is no literature on spermatic cord torsion in octogenarians, probably due to its rarity. The majority of studies show spermatic cord torsion in

patients under 55 years of age [4] [5].

Studies show that the oldest patients were 44 [4], 55 [5] and 46 [8] years old respectively. Skoglund, in his study, had a patient of 78 years but the mean age was 14.9 years [9]. Our patient was 80 years old. Furthermore, twisting of spermatic cord, classically, presents two peaks of frequency in children: the neonatal period and adolescence [4]. This shows the rarity of cases of spermatic cord torsion in the elderly (**Table 1**).

The average consultation time was 102 hours, 24.6 hours and 27.5 hours respectively in Senegal [4], Burkina Faso [5] and France [8]. Our patient consulted less than 6 hours after the onset of pain. This can be explained by the fact that the elderly have less tolerance for pain than young adults. Another explanation for the rapid consultation time is that the patient's children are more sensitive to the onset of a painful condition, as the life expectancy of this patient is considerably reduced.

The patient presented with pain in the bursa, ascending and horizontalizing of the testicle and no pain in the elevation of the testicle. Pain is the most common symptom [4] [5] [10]. Horizontalization of the testis and lack of pain on elevation of the testis are the dominant clinical features of spermatic cord torsion [10]. The absence of testicular swelling in the patient may be explained by the delay in consultation. The abolition of the cremasteric reflex remains an important clinical feature in the diagnosis of spermatic cord torsion as in our patient.

Della-Negra *et al.* [6] noted in their study that it is necessary to systematically evoke a torsion of the spermatic cord in front of an adult presenting with scrotal pain which combines:

- Absence of urinary signs;
- Negative urine dipstick;
- Severe pain;
- Ascending testis;
- Superacute stage.

Our patient had all these characteristics.

Some studies advise against ultrasound for diagnostic confirmation as scrotal ultrasound is falsely reassuring in 10% [8] and Doppler ultrasound only confirms the diagnosis in 5 out of 8 cases [5]. However, in our patient, his age and the incidence of spermatic cord torsion led us to request an ultrasound scan. Furthermore, Zini and al. mentioned the problem of ultrasound in patients who had a rather long delay in consultation [8].

Table 1. Distribution of ages of occurrence of spermatic cord torsion by study.

Articles	Age group
Sarr A, 2010 (Senegal) [4]	1 - 44 years
FA Kabore, 2011 (Burkina Faso) [5]	16 - 55 years
Laurent ZINI, 2003 [8]	1 - 46 years
Skoglund, 1970 [9]	Neo-natal period - 78 years

Our patient had testicular pain on the right side. The majority of patients have right-sided testicular pain [4].

The urine dipstick did not find anything unusual. Della-Negra *et al.* [6] recommend the systematic use of urine strips in adults to rule out acute orchio-epididymitis in cases of acute painful bursa, especially as torsion of the spermatic cord is an often overlooked diagnosis in the face of acute scrotal pain in adults [6].

We performed a bilateral orchidopexy. Delay in consultation seems to be the main predictive factor for orchiectomy for testicular necrosis [5] and the only predictive factor for testicular necrosis is the delay in management [6]. The sixth hour seems to be the upper limit after which testicular necrosis occurs [6], so we can say that the early management of this patient was an important factor in safeguarding testicular vitality. Fixation of the contralateral testis with a torsion of the spermatic cord is currently recommended by all authors [8] [10] [11]. Our preference is bilateral orchidopexy when the testicle is alive, as do some authors [6] [8]. This attitude is justified by the real risk of subsequent torsion of the contralateral testicle which is 3% to 18% depending on the authors [11].

Spermatic cord torsion is the most common subject of medico-legal dispute in urological practice [8]. The most common torts are diagnostic uncertainty, diagnostic and therapeutic delays and diagnostic errors that can lead to organ loss [8]. Elderly patients and those with atypical symptoms are the most likely to complain [8]. Therefore, clinical management of spermatic cord torsion is of major interest, especially for patients over 50 years old. The mastery of the clinic of the torsion of the spermatic cord remains of major interest especially for a subject over 50 years.

4. Conclusions

Spermatic cord torsion in octogenarians is rare and should be suspected in the first instance in the presence of any sudden onset, severe testicular pain without urinary signs with an ascended testicle and a negative urine dipstick. The diagnosis is primarily clinical. And, there may be a medico-legal situation that requires clinical and surgical mastery of the torsion of the spermatic cord.

Learning Points/Take Home Messages

It is always necessary to think of a twisting of the spermatic cord (urological surgical emergency) in front of an acute testicular pain whatever the age of the patient, especially if the clinic is evocative.

Acknowledgements

We would like to thank the administration and staff of the Urology Department of the Yaounde Central Hospital.

Ethics Approval and Consent to Participate

We got a research permit from the Ethics Committee at the Central Hospital of

Yaounde.

Consent for Publication

We obtained consent from the patient and we got a research permit from the Ethics Committee at the Central Hospital of Yaounde.

Authors' Contributions

- FJC operated on the patient and wrote this case report;
- MMJB was the surgery supervisor;
- OA was the operating assistant;
- BMDC and RA have supervised the translation process of this case report;
- MLO, MC and MAA were on the reading committee;
- MH did the Doppler ultrasound of the testicles;
- FPJ and SMA supervised the writing of this case report.

All authors have read and approved the manuscript.

Consent to Publish

The patient gave consent.

Conflicts of Interest

We do not declare any conflict of interest within the framework of this study.

References

- [1] Rambeaud, J.J. and Descotes, J.L. (1991) Torsion du testicule et de ses annexes. *EncyclMéd Chir (Scientific and Medical Editions Elsevier SAS, Paris), Néphrologie-Urologie*, 18-622-A-10, 1-6
- [2] Hodonou, R., Soumanou-Kaffo, R. and Akpo, C. (1999) Torsion du cordon spermatique cordon spermatique: Facteurs étiopathogéniques, diagnostiques et thérapeutiques-concernant 33 Cas au CNHU de Cotonou. *Medicine in Black Africa*, **46**, 69-74.
- [3] Roth, C.C., Mingin, G.C. and Ortenberg, J. (2011) Salvage of Bilateral Asynchronous Perinatal Testicular Torsion. *The Journal of Urology*, **185**, 2464-2468. <https://doi.org/10.1016/j.juro.2011.01.013>
- [4] Sarr, A., Fall, B., Mouss, B., *et al.* (2010) Diagnostic and Therapeutic Aspects of Spermatic Cord Torsion at CHU Aristide-Le-Dantec de Dakar. *Basic and Clinical Andrology*, **20**, 203-208. <https://doi.org/10.1007/s12610-010-0083-2>
- [5] Kaboré, F.A., Zango, B., Yameogo, C., *et al.* (2011) Spermatic Cord Torsion in Adults at CHU Yalgado Ouédraogo de Ouagadougou. *Basic and Clinical Andrology*, **21**, 254-259. <https://doi.org/10.1007/s12610-011-0151-2>
- [6] Della-Negra, E., Martin, M., Bernardini, S. and Bittard, H. (2000) Spermatic Cord Torsion in Adults. *Progres en Urologie. Journal de L'Association Francaise D Urologie et de la Societe Francaise D Urologie*, **10**, 265-270.
- [7] Houlgatte, A., Fournier, R. and Berlizo, P. (2001) Torsion du cordon spermatique et des annexes testiculaires. *EncyclMéd Chir (Éditions Scientifiques et Médicales Elsevier SAS, Paris), Urgences*, 24-203-A-10, 1-6.
- [8] Zini, L., Mouton, D., Leroy, X., Valtille, P., Villers, A., Lemaitre, L. and Biserte, J.

- (2003) Should Scrotal Ultrasound Be Discouraged in Cases of Suspected Torsion of the Spermatic Cord Torsion? *Progres en Urologie. Journal de L'Association Francaise D'Urologie et de la Societe Francaise D'Urologie*, **13**, 440-444.
- [9] Skoglund, R.W., Mcroberts, J.W. and Ragde, H. (1970) Torsion of the Spermatic Cord: A Review of the Literature and an Analysis of 70 New Cases. *The Journal of Urology*, **104**, 604-607. [https://doi.org/10.1016/S0022-5347\(17\)61792-0](https://doi.org/10.1016/S0022-5347(17)61792-0)
- [10] Bah, O.U., Roupret, M., Guirassy, S., Diallo, A.B., Diallo, M.B. and Richard, F. (2010) Clinical and Therapeutic Aspects of Spermatic Cord Torsion: Study of 27 Cases. *Progrès en Urologie*, **20**, 527-531. <https://doi.org/10.1016/j.purol.2009.12.011>
- [11] Mongiat-Artus, P. (2004) Torsion du cordon spermatique et des annexes testiculaires. *Annales D'Urologie*, **38**, 25-34. <https://doi.org/10.1016/j.anuro.2003.11.001>

Surgical Haematuria: An Analysis of Causes in a Southern Nigerian State

Vitalis Obisike Ofuru, Victor Abhulimen*

Department of Surgery, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

Email: *victorabhulimen80@gmail.com

How to cite this paper: Ofuru, V.O. and Abhulimen, V. (2022) Surgical Haematuria: An Analysis of Causes in a Southern Nigerian State. *Open Journal of Urology*, 12, 401-409. <https://doi.org/10.4236/oju.2022.127039>

Received: June 14, 2022

Accepted: July 15, 2022

Published: July 18, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). <http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Background: Surgical haematuria is not very common but ominous when it occurs. Knowledge of the causes will help in the adequate management of the disease. **Aim:** To evaluate the causes of surgical haematuria in Port Harcourt, Nigeria. **Materials and Method:** This is 10 years retrospective study of patients who presented at the University of Port Harcourt Teaching Hospital and 4 other private urology centres in Port Harcourt with haematuria of surgical aetiology between January 2012 and December 2021. Their history, examination findings and investigations were evaluated. Patients with medical haematuria and incomplete records were excluded from the study. **Results:** Three hundred and forty-six patients were evaluated. The mean age was 58.12 ± 5.1 . Two hundred and sixty-four (76.3%) were men and eighty-two (23.7%) were females. The three commonest causes of haematuria were Benign prostatic enlargement, prostate cancer and urolithiasis with a frequency of 126 (36.41%), 66 (19.08%) and 40 (11.56%) respectively. The cause of haematuria was benign in 232 (67.06%) subjects and malignant in 114 (32.94%). **Conclusion:** The commonest causes of haematuria are of prostatic origin, mainly benign although malignancy is a significant cause.

Keywords

Haematuria, Surgical, Benign Prostatic Enlargement, Prostate Cancer

1. Introduction

Haematuria is derived from the Greek words haima “blood” and ouron “urine” [1]. It simply implies the presence of blood in the urine. Haematuria can be due to a lesion in any part of the urinary tract from the kidneys to the urethral meatus. Haematuria can affect men, women, young and elderly.

Haematuria may also present with symptoms (symptomatic haematuria) or present without symptoms (asymptomatic haematuria). It can be persistent or transient. Common causes of transient haematuria include sexual intercourse and menstrual contamination. Haematuria can also be classified into visible (macroscopic, gross) and non-visible (microscopic) haematuria [2]. Visible haematuria is important as it may be a sign and symptom of urological malignancy [2] [3] [4] [5]. The term surgical haematuria is sometimes ascribed to visible haematuria. Visible haematuria can sometimes be frightening. Non-visible haematuria associated with proteinuria is usually caused by medical conditions (renal disease) and is sometimes termed medical haematuria [6] [7]. Common causes of haematuria include trauma, tumours, infections, strictures, calculi and even exercise [1].

It was believed that the commonest cause of haematuria in riverine communities in Africa is Schistosomiasis [8] [9]. However, diseases of the prostate especially benign prostatic enlargement have been identified as a common cause of haematuria in our environment in recent times [10] [11]. This study aims therefore to profile the different causes of surgical haematuria in Port Harcourt, a major city in the coastal Niger Delta area of Nigeria.

2. Materials and Methods

This was a retrospective study. Patients who presented to the hospital with haematuria between January 2012 and December 2021 were evaluated. The study was carried out at the Urology Unit of the University of Port Harcourt Teaching Hospital and four other privately owned urological centres in the Port Harcourt metropolis. Data was obtained from ward admission registers and theatre, accident and emergency and discharge records. The gotten information included history, duration of haematuria, examination findings at presentation and investigations done. Investigations included urinalysis, culture and sensitivity, full blood count, serum electrolyte and creatinine, genotype, ultrasound scan, intravenous urography, computerized tomography (CT) scan, cytology, rigid cystoscopy and biopsy.

Inclusion criteria were all cases of haematuria in all ages seen within the study duration. Exclusion criteria were patients with incomplete records, suspected cases of medical haematuria such as those with proteinuria on urinalysis, patients with known kidney disease, patients with poor corticomedullary differentiation on ultrasound scan or CT scan and patients with exercise induced haematuria. Patients who had proteinuria with haematuria were also excluded.

The data from the folders were collated and entered using Microsoft Excel 2016 version and transferred into the Statistical Package for Social Sciences (SPSS) for windows (version 20) (IBM SPSS Inc. Chicago, IL) for analysis. Categorical data was presented in the form of frequencies and percentages using tables. Continuous variables were presented in means and standard deviation. Results were presented in tables (**Tables 1-4**).

3. Results

A total of 405 patients presented with haematuria within the study period. However, only 346 patients had complete records and were included in the study. Fifty-nine patients who either did not have complete records or had medical haematuria were excluded.

Table 1. (a) Age distribution of respondents showing the number of patients with haematuria and the percentages. The 50 to 59 year age group was the commonest age group presenting with haematuria; (b) Measures of central tendencies.

(a)		
Age (years)	Frequency	Percentage
0 to 9	0	0
10 to 19	4	1.15
20 to 29	8	2.31
30 to 39	10	2.89
40 to 49	28	8.09
50 to 59	156	45.09
60 to 69	70	20.23
70 to 79	42	12.14
80 to 89	28	8.09
TOTAL	346	100
(b)		
Mean age	58.12	
Standard deviation	5.1	
Youngest age	18	
Oldest age	86	
Range	68	

Table 2. Sex distribution of patients and their percentages, males had the highest frequency.

Sex	Frequency
Male	264 (76.3%)
Female	82 (23.7%)
Total	346

Table 3. Aetiology of haematuria in respondents, BPE (36.41%), cancer of the prostate (19.08%), calculi (11.56%) and cancer of the bladder (8.09%) are the four commonest causes of haematuria.

Aetiology	Frequency	Percentage
BPE	126	36.41
Cancer of the prostate	66	19.08
Calculi	40	11.56
Ca bladder	28	8.09
Trauma	26	7.51
UTI	22	6.36
RCC	20	5.78
Unknown	14	4.05
Schistosomiasis	4	1.16
	346	100

Table 4. Distribution of malignant and benign causes of haematuria. Majority of patients presented with benign cases of haematuria.

Mode of presentation	Frequency	Percentage
Benign	232	67.05
Malignant	114	32.94
Total	346	100

4. Discussion

The study revealed that the 50 to 59 year old age group had the highest frequency and the mean age of patients with haematuria was 58.12 ± 5.1 as shown in **Table 1(b)**. The youngest patient in this study was 18 years and the oldest was 86 years. A prospective study conducted by Ogunjimi *et al.* [3] in Lagos, South West, Nigeria had a mean age of patients with haematuria as 54 years. Another prospective study carried out in Dibrugarh, India discovered that the 50 to 60 year age group had the highest frequency of patients with haematuria [5]. A similar study conducted in Malaysia had a mean age of 59 years [12]. The mean age in these studies is similar to the mean age in ours. Common neoplastic conditions that cause haematuria as shown in our study occur within this age group.

This study revealed that male subjects were 264 (76.3%) while female subjects were 82 (23.7%). This gives an approximate male, female ratio of 3:1. The study by Newme *et al.* [5] had a similar finding, with 79% of the patients being male and 20.93% being female. Another study in China by Wu *et al.* [13] found no significant differences in the prevalence of hematuria between sexes; they attributed the sex-related discrepancy to differences in lifestyle. Studies that focused more on surgical haematuria tend to have a male preponderance, [3] [5] this

may be the reason for the male preponderance in our study; the other reason for the male preponderance is because the commonest cause of haematuria in this study is BPE.

Benign prostatic enlargement is a disease of aging men, the progressively enlarging prostate gland causes lower urinary tract symptoms and lead to significant bother [14] [15]. The commonest aetiology of haematuria in this study was BPE which was present in 36.41% of respondents, followed by cancer of the prostate with 19.08% and urolithiasis in 11.56%. The studies conducted by Ogunjimi *et al.* [3] and Ng *et al.* [12] have benign prostatic hyperplasia as the commonest cause of haematuria. In Newme *et al.* study, BPE is the second most common cause after cancer of the bladder [5]. As the prostate gland enlarges it acquires new vessels which are in many cases friable and bruise easily, leading to haematuria [16] [17] [18] [19]. Furthermore, in some patients with BPE, prostatic obstruction can lead to obstructive nephropathy with associated uraemia [17] [18]. Urea impairs platelet aggregation via the formation of guanidinosuccinic acid and phenolic acid leading to haematuria [18]. The stasis of urine can also lead to bacterial proliferation further worsening the friability of the neovascularized prostate, thereby leading to haematuria [17].

Prostate cancer is the second most frequent cancer diagnosed in men (after cancer of the lungs) worldwide [20]. In Nigeria, prostate cancer is the most commonly diagnosed cancer among men [20] [21]. The second most common cause of haematuria in this study was cancer of the prostate. The pathophysiology of haematuria in patients with cancer of the prostate and its resulting anaemia has been described by Raphael *et al.* [17]. Metastatic Prostate cancer spreads to the bones [15], which is the site of blood cells production. Therefore, prostate cancer can lead to pancytopenia which can result in haematuria. Kafor *et al.* [19] in a retrospective study conducted in Owerri, South Eastern Nigeria also noted prostate cancer as a significant cause of haematuria. However, increased awareness and screening of prostate cancer has led to diagnosis at an early stage consequently reducing haematuria from prostate cancer disease.

Urolithiasis is a global problem and its incidence is on the increase. Previously, urolithiasis was reported as being relatively rare among Africans but recent data suggest otherwise [22]. Urolithiasis was the third most common cause of haematuria in this study. Change in diet to a more Westernized diet, sedentary life styles and hotter climate probably from Global warming (leading to decreased urine production) are probable reasons for the increase in urolithiasis [23]. Every patient with urolithiasis in this study presented with painful haematuria.

The kidneys are located in the lumbar region and protected by the bulk of flank muscles and the rib cage. However, in severe accidents, the kidneys or any part of the urinary tract can be injured resulting in haematuria. Aragona *et al.* [24] retrospectively studied renal trauma and noted trauma as an important cause of haematuria. Twenty-six subjects presented with traumatic haematuria in

this study. Among them, six had road traffic accident, 5 suffered gunshot wounds and fifteen had traumatic urethral catheterization.

Schistosomiasis, caused by *Schistosoma haematobium* is endemic in many African countries [25]. Humans are infected by cercariae when they are in contact with contaminated freshwater. The adult worms reside in the vesical plexuses, where the female lays its egg. The lesions in urinary schistosomiasis result from the granulomatous host response to the deposition of schistosome eggs in the tissues and it presents as terminal haematuria [25]. Only 4 (1.16%) subjects had haematuria secondary to schistosomiasis in our study, even though Port Harcourt is located in a riverine district, showing clearly that schistosomiasis is not a common cause of haematuria in this environment. None of the 4 subjects grew up in Rivers State. One of them grew up in Benin City and also had associated rectal cancer. Accounts of patients with Schistosomiasis presenting with rectal cancer have been reported [26] [27].

Carcinoma of the bladder is a common cause of painless haematuria. It was the 4th most common cause of haematuria in this study and was present in 8.09%. An observational study by Newme *et al.* [5] reported that carcinoma of the bladder was the commonest cause of haematuria. In areas where schistosomiasis is endemic and where fresh water streams abound schistosomiasis and bladder carcinoma are common. Schistosomiasis is not endemic in Port Harcourt, Rivers state.

RCC is the most common type of kidney cancer in adults, responsible for approximately 90% to 95% of cases [21] [28]. Renal cell carcinoma presents with haematuria, loin mass and loin pain in the advanced stage [29]. Renal cell carcinoma is associated with the elaboration of vascular endothelial growth factors. This results in neovascularization and consequent presentation with haematuria. In this study 5.78% of patients with haematuria had RCC. Ogunjimi *et al.* [3] had 5.1% and Newme *et al.* [5] had 2.32%. All our patients presented at an advanced stage of RCC. Studies by Atanda *et al.* [29] also reported late presentation of most patients.

There is an observed increase in the cases of haematuria attributable to malignancy. In this study, 114 (32.94%) patients presented with a malignant cause of haematuria and 232 (67.05%) presents with a benign cause of haematuria as shown in **Table 4**. Ogunjimi *et al.* [3] had a 22.02% percentage of malignant cases among another Nigerian population about a decade earlier. This difference may be due to the increasing awareness of cancers between 2011 when their study was published and 2022 [18]. A similar study in India had a higher percentage of cancer of 65.11% while benign cases were 34.89%. The higher percentage of cancers in their study may be due to increased screening and awareness and better radiological services when compared to the African population.

5. Limitation of the Study

This was a retrospective study and some clinical information sought were not

available and this limited the sample size as only patients with complete information were included in the surgery. Some patients' folder was completely missing, their names were on the admission records but their folders could not be found.

6. Conclusion

The commonest cause of haematuria in our study is from the prostate, with benign prostatic enlargement being the leading cause and then prostate cancer. There is an increase in the malignant causes. Prompt evaluation and treatment of haematuria are important as they can be life-threatening.

Conflicts of Interest

The authors declare there was no conflict of interest in this study.

Source of Funding

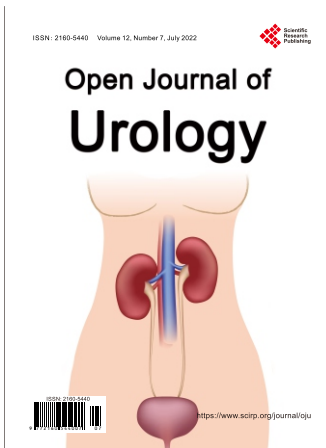
This study was self-funded by the authors.

References

- [1] Bolenz, C., Schröppel, B., Eisenhardt, A., Schmitz-Dräger, B.J. and Grimm, M.O. (2018) The Investigation of Hematuria. *Deutsches Ärzteblatt International*, **115**, 801-807. <https://doi.org/10.3238/arztebl.2018.0801>
- [2] Bagnall, P. (2014) Haematuria: Classification, Causes and Investigations. *British Journal of Nursing*, **23**, 1074-1078. <https://doi.org/10.12968/bjon.2014.23.20.1074>
- [3] Ogunjimi, M.A., Adetayo, F.O., Tijani, K.H., Jeje, E.A., Ogo, C.N. and Osegbe, D.N. (2011) Gross Haematuria among Adult Nigerians: Current Trend. *The Nigerian Postgraduate Medical Journal*, **18**, 30-33.
- [4] Tan, W.S., Feber, A., Sarpong, R., Khetrapal, P., Rodney, S., Jalil, R., Mostafid, H., Cresswell, J., Hicks, J., Rane, A. and Henderson, A. (2018) Who Should Be Investigated for Haematuria? Results of a Contemporary Prospective Observational Study of 3556 Patients. *European Urology*, **74**, 10-14. <https://doi.org/10.1016/j.eururo.2018.03.008>
- [5] Newme, K., Hajong, R. and Bhuyan, R.K. (2021) A Clinical Study on Surgical Causes of Hematuria. *Journal of Family Medicine and Primary Care*, **10**, 265-271. https://doi.org/10.4103/jfmpc.jfmpc_1750_20
- [6] Akubuilu, U.C., Ayuk, A., Ezenwosu, O.U., Okafor, U.H. and Emodi, I.J. (2020) Persistent Hematuria among Children with Sickle Cell Anemia in Steady State. *Hematology, Transfusion and Cell Therapy*, **42**, 255-260. <https://doi.org/10.1016/j.htct.2019.07.007>
- [7] Chime, P.U., Muoneke, U.V., Una, A.F., Mbanefo, N.R., Bisi-Onyemaechi, A.I. and Igbokwe, O.O. (2020) Proteinuria and Haematuria in Apparently Healthy Primary School Children in Enugu, Nigeria. *Nigerian Journal of Medicine*, **29**, 38-42.
- [8] Isah, B.A., Musa Giro, A., Yahaya, M., Awosan, K.J., Ibrahim, M.T.O. and Raji, M.O. (2017) Knowledge and Perception of Causes of Gross Haematuria among the Inhabitants of Kwakwalawa Riverine Settlement of Sokoto. *International Journal of Research-Granthaalayah*, **5**, 1-10. <https://doi.org/10.29121/granthaalayah.v5.i8.2017.2176>

- [9] Oyeyemi, O.T., de Jesus Jeremias, W. and Grenfell, R.F. (2020) Schistosomiasis in Nigeria: Gleaning from the Past to Improve Current Efforts towards Control. *One Health*, **11**, Article ID: 100183. <https://doi.org/10.1016/j.onehlt.2020.100183>
- [10] Obiesie, E.A., Nwofor, A.M., Obiesie, S.O., Odo, C., Odili, A.O., Oranusi, C.K., *et al.* (2021) Intractable Haematuria Secondary to Pedunculated Median Lobe of the Prostate-A Diagnostic Dilemma. *Afrimedical Journal*, **7**, 35-42.
- [11] Ofuru, V.O. and Obiorah, C.C. (2017) The Role of Dutasteride in Acute Prostatic Haematuria. *International Journal of Clinical Medicine*, **8**, 595-603. <https://doi.org/10.4236/ijcm.2017.811056>
- [12] Ng, K.L., Htun, T.H., Dublin, N., Ong, T.A. and Razack, A.H. (2012) Assessment and Clinical Significance of Haematuria in Malaysian Patients-Relevance to Early Cancer Diagnosis. *Asian Pacific Journal of Cancer Prevention*, **13**, 2515-2518. <https://doi.org/10.7314/APJCP.2012.13.6.2515>
- [13] Wu, Y., Zhang, J., Wang, Y., Wang, T., Han, Q., Guo, R., Zhang, R., Ren, H., Zhu, Y., Xu, H. and Li, L. (2020) The Association of Hematuria on Kidney Clinicopathologic Features and Renal Outcome in Patients with Diabetic Nephropathy: A Biopsy-Based Study. *Journal of Endocrinological Investigation*, **43**, 1213-1220. <https://doi.org/10.1007/s40618-020-01207-7>
- [14] Powell, T., Kellner, D. and Ayyagari, R. (2020) Benign Prostatic Hyperplasia: Clinical Manifestations, Imaging, and Patient Selection for Prostate Artery Embolization. *Techniques in Vascular and Interventional Radiology*, **23**, Article ID: 100688. <https://doi.org/10.1016/j.tvir.2020.100688>
- [15] Raphael, J.E. and Abhulimen, V. (2021) Is there any Relationship between Total Prostate Volume, Intravesical Prostatic Protrusion and Lower Urinary Tract Symptoms in Adult Nigerian Men with Benign Prostatic Enlargement? *West African Journal of Medicine*, **38**, 578-582.
- [16] Kashif, K.M., Foley, S.J., Basketter, V. and Holmes, S.A. (1998) Haematuria Associated with BPH—Natural History and a New Treatment Option. *Prostate Cancer and Prostatic Diseases*, **1**, 154-156. <https://doi.org/10.1038/sj.pcan.4500224>
- [17] Raphael, J.E. and Abhulimen, V. (2022) Retrospective Analysis of Complications from Prostate Cancer among Nigerians. *Saudi Journal of Medicine*, **7**, 99-104. <https://doi.org/10.36348/sjm.2022.v07i02.002>
- [18] Badoe, E.A., Archampong, E.Q. and Rocha Afodu, A.T. (Editors) (2009) Principles and Practice of Surgery Including Pathology in the Tropics. 4th Edition, Assemblies of God literature Centre Ltd., Accra.
- [19] Kafor, M.B., Nnadi, G.I. and Onuigbo, W.I. (2019) Haematuria in Benign Prostatic Hyperplasia and Prostatic Carcinoma. Prostate. *International Journal of Health Sciences & Research*, **9**, 152-156.
- [20] Raphael, J.E. and Victor, A. (2022) Age and Gleason's Score in Prostate Cancer among Southern Nigerians: Is There a Correlation? *Journal of Cancer and Tumor international*, **12**, 8-15. <https://doi.org/10.9734/jcti/2022/v12i230171>
- [21] Ofuru, V., Ekeke, N. and Obiorah, C. (2017) Genitourinary Malignancies in Port Harcourt, Nigeria. *Port Harcourt Medical Journal*, **11**, 10-14. https://doi.org/10.4103/phmj.phmj_9_17
- [22] Wathigo, F.K., Hayombe, A. and Maina, D. (2017) Urolithiasis Analysis in a Multiethnic Population at a Tertiary Hospital in Nairobi, Kenya. *BMC Research Notes*, **10**, Article No. 158. <https://doi.org/10.1186/s13104-017-2474-3>
- [23] López, M. and Hoppe, B. (2010) History, Epidemiology and Regional Diversities of Urolithiasis. *Pediatric Nephrology*, **25**, 49-59.

- <https://doi.org/10.1007/s00467-008-0960-5>
- [24] Aragona, F., Pepe, P., Patanè, D., Malfa, P., D'Arrigo, L. and Pennisi, M. (2012) Management of Severe Blunt Renal Trauma in Adult Patients: A 10-Year Retrospective Review from an Emergency Hospital. *BJU International*, **110**, 744-748. <https://doi.org/10.1111/j.1464-410X.2011.10901.x>
- [25] Tzanetou, K., Adamis, G., Andipa, E., Zorzos, C., Ntoumas, K., Armenis, K., Kontogeorgos, G., Malamou-Lada, E. and Gargalianos, P. (2007) Urinary Tract *Schistosoma haematobium* Infection: A Case Report. *Journal of Travel Medicine*, **14**, 334-337. <https://doi.org/10.1111/j.1708-8305.2007.00137.x>
- [26] Al-Mashat, F., Sibiany, A., Radwi, A., Bahadur, Y., Al-Radi, A., Meir, H. and Ahmed, G.E. (2001) Rectal Cancer Associated with Schistosomiasis: Report of Two Cases and Review of the Literature. *Annals of Saudi Medicine*, **21**, 65-67. <https://doi.org/10.5144/0256-4947.2001.65>
- [27] Hamid, H.K. (2019) *Schistosoma japonicum*-Associated Colorectal Cancer: A Review. *The American Journal of Tropical Medicine and Hygiene*, **100**, 501-505. <https://doi.org/10.4269/ajtmh.18-0807>
- [28] Bukhari, S., Amodu, A., Akinyemi, M. and Wallach, S. (2017) Persistent Hematuria Caused by Renal Cell Carcinoma after Aortic Valve Replacement and Warfarin Therapy. *Baylor University Medical Center Proceedings*, **30**, 327-329. <https://doi.org/10.1080/08998280.2017.11929635>
- [29] Atanda, A.T. and Haruna, M.S. (2017) Renal Cell Carcinoma in Nigeria: A Systematic Review. *Sahel Medical Journal*, **20**, 137-142. https://doi.org/10.4103/smj.smj_67_16



Open Journal of Urology (OJU)

ISSN 2160-5440 (Print) ISSN 2160-5629 (Online)

<https://www.scirp.org/journal/oju>

Open Journal of Urology (OJU) is an international journal dedicated to the latest advancement of urology. The goal of this journal is to provide a platform for researchers and academics all over the world to promote, share, and discuss various new issues and developments in urology related problems. All manuscripts must be prepared in English, and are subject to a rigorous and fair peer-review process. Accepted papers will immediately appear online followed by printed hard copy.

Subject Coverage

The journal publishes original papers including but not limited to the following fields:

- Female Pelvic Medicine and Reconstructive Surgery
- General Urology
- Male and Female Sexual Dysfunction
- Pediatric Urology
- Reconstructive Urology
- Stone Disease
- Urinary Physiology
- Urodynamics and Neurourology
- Urologic Oncology

We are also interested in: 1) Short reports—2-5 page papers where an author can either present an idea with theoretical background but has not yet completed the research needed for a complete paper or preliminary data; 2) Book reviews—Comments and critiques.

Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

Website and E-Mail

<https://www.scirp.org/journal/oju>

E-mail: aju@scirp.org

What is SCIRP?

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

What is Open Access?

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, worldwide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience



**Scientific
Research
Publishing**

Website: <https://www.scirp.org>

Subscription: sub@scirp.org

Advertisement: service@scirp.org