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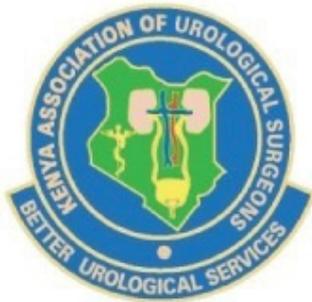
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Kenya Urology Journal

The Kenya Journal of Urology (KJU) will be published quarterly and the next issue is expected to be published in April 2022. The Editor-in-Chief is calling for manuscripts for consideration. All manuscripts submitted will undergo peer review so it's advisable to submit them in good time. Manuscripts should be submitted to: **kausorg@gmail.org**

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Editor's note

It was a great honor for the Kenya Association of Urological Surgeons (KAUS) to entrust our editorial board with the duty of publishing the *Kenya Journal of Urology* (KUJ) on behalf of the KAUS. The presence of many urologists in Kenya and the East African region and the establishment of urology as a discipline of surgery has helped us bring out this journal even though starting from scratch is always challenging.

We have started this journal at a time when medical publishing has become ever more scrutinized and the authors, editors and publishers need to scrutinize carefully what they put out there.

There is increased knowledge and use of methodology and statistics further enriching articles in every publication. Peer review is now a standard of production in all publications and ours will not

be any different. It is the responsibility of authors and editors to use soft wares to identify plagiarism fabrication and deficiencies in honesty. We must ensure that ethical issues, conflict of interest are important considerations in our publications.

We have launched this journal knowing that there are challenges to overcome but we are confident that members of our society, students, researchers and our collaborators have trust in us. We shall run this journal in the most professional way and we shall be courageous enough as we introduce a culture of publishing amongst our members and promoting the seeking of knowledge processing it and distributing it for the improvement in the practice of urology.

Prof. Peter Mungai Ngugi
Editor-in-Chief

At the cradle of Kenya Journal of Urology

Opondo D

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Scientific research in the field of urology has grown in the last century. Driven by new knowledge and innovation, urology has matured and further grown into various sub-specialties. Much of the contemporary body of knowledge in urology has come out of scientificThe west has definitely contributed to the field but would the statement leave the east unrecognized on this statement. Would it be better to say “scientific work outside the African continent”.

Published research output in Africa remains low partly because of lack of robust local journals but mainly because of low research activity in the continent. This low publication rate results into loss of opportunities to grow science and practice of urology in the continent. Epidemiological data about urological disease in the continent is not mature and therefore negatively impacts on policy as well as investment in urological services.

Moreover, low research output translates into lack of local evidence to guide clinical practice. The current evidence-based guidelines used by many urologists in Africa are based on research which was conducted in North America and Europe. Development and dissemination of local best practices has thus been impaired.

In addition, lack of documentation of experience leads to poor transfer of knowledge across generations of practitioners. Younger and future generations of urologists may not have the benefit of understanding the history and evolution of urology practice in the continent.

African urology remains less visible in the global platform in the absence of robust research activities and publications from the continent. We lose opportunities for multicenter and multinational collaborations that have proven to be a significant force in the development of global urology practice.

It is with this background that the Kenya Association of Urological Surgeons (KAUS) has

established the *Kenya Journal of Urology* (KJU). KJU aims to promote scientific research and publication from the membership of the KAUS as well as other urologists and researchers from East Africa, and the rest of Africa.

Some of the themes that KJU aims to promote include work on infectious diseases in urology. Africa still has a high burden of infectious disease which significantly impact urological practice. Such infectious diseases include multidrug resistance, tuberculosis, HIV and recently COVID -19. Also, there is an opportunity for research on neglected urological conditions such as urotrauma and endemic conditions like schistosomiasis and lymphatic filariasis. Furthermore, we hope to attract researchers to report on the unique presentation of urologic cancer in the African population as well as outcomes research in urologic oncology. Besides, the adoption of modern urological technology in the region and the impact is an opportune area of scientific work. We believe that KJU will provide a platform for researchers to share their experiences and findings from the foregoing research agenda among other studies.

In this inaugural issue, we present original articles and case reports in both adult and paediatric urology. Some of the highlights include the work of Mohamed *et al* where they present experience with adoption of laparoscopic nephrectomy while Osawa *et al* report the impact of international collaboration on the outcomes of hypospadias surgery. The issue also includes three interesting case reports.

Lastly, I would like to sincerely thank the editorial board, authors and publishers for putting together the inaugural issue of *KJU*. We hope that the readers will find these articles interesting and encourage the urological community to submit their work to the *KJU* which we anticipate to publish quarterly.

Laparoscopic nephrectomy: A Kenyan experience

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ABSTRACT

Objective: The aim of this study was to analyze and report our experience with laparoscopic nephrectomy in our setting.

Methods: A retrospective analysis of patients records from the year 2016-2018 who underwent laparoscopic nephrectomies in our setting. Data collected included age of the patient, indication for surgery, site of nephrectomy, procedure time, estimated blood loss, hospital stay and post operative complications.

Results: The average age was 54 years and a male to female ratio of 2:1. The most common indication for nephrectomy was tumour (83%) and the right kidney was removed in 66% of the patients. The mean length of hospital stay was 2.75 days. There were no significant complications in the patients.

Conclusion: Laparoscopic nephrectomy is associated with good perioperative outcome and is feasible option for nephrectomy in our setting.

Keywords: Laparoscopic nephrectomy

INTRODUCTION

Laparoscopy and other minimally invasive surgical procedures have gained favour over open procedures in many aspects of abdominal surgery and laparoscopic nephrectomy (LN) is no exception. After its inception by Clayman *et al* in the 1990 (1), LN has since been embraced and is utilized more as both the equipment and technical expertise in laparoscopy have improved. It has become the standard of care over open nephrectomy in the developed world, as it is associated with good outcomes even in oncologic surgery and decreased morbidity compared to open nephrectomy (2,3). As a consequence of LNs' wide adoption, the initial restraint due to prolonged length of time of surgery and costs have been disproven and is now the standard of care (4-6).

Laparoscopic nephrectomy (LN) can be approached either transperitoneally or retroperitoneally. Indications for nephrectomy can include several different types of benign conditions that cause irreversible renal damage, malignancy or in renal donor nephrectomies (7, 8). It can be performed as either simple, radical or partial nephrectomy. Open nephrectomy is currently reserved for large masses and complex cases.

Despite being a standard of care in developed countries, LN is rarely used in developing countries due to several shortcomings such as lack of access to equipment, availability of expertise due to its technical complexity and required learning curve and

socioeconomic reasons (9-11). The learning curve reported in literature for laparoscopic nephrectomy is 15-50 cases (12, 13).

The aim of this study is to report on our experience with transperitoneal laparoscopic nephrectomy and demonstrate it as a feasible option and be set as a possible standard of care in our country and region.

MATERIALS AND METHODS

A retrospective chart review of all patients who underwent laparoscopic nephrectomy between 2016 -2018. Data collected from patients' medical records included demographic, clinical and radiological information, operative information (operative time, site, estimated blood loss, transfusion required) and postoperative outcomes (such as complications), length of hospital stay (LOS), histopathology.

IBM Statistical Package for Social Sciences (SPSS) Version 25.0 (IBM Corp, Armonk, NY) was used for statistical analysis. Descriptive characteristics were summarized and presented as means and standard deviation. Categorical variables were presented as frequencies and proportions.

Technique of the transperitoneal laparoscopic nephrectomy

Transperitoneal LN procedure is completed by insertion of an umbilical visual port. Once pneumoperitoneum is achieved, successive

triangulated three or four working ports are inserted under vision. This is achieved through the 'Baseball-Diamond Concept' for port placement (14, 15).

The colon is reflected medially, along the lateral line of Toldt, to expose the kidney. The psoas tendon is a reliable landmark when searching for the gonadal vein and ureter and the ureter can also be identified as it crosses over the iliac vessels. Once located, the ureter is elevated from the psoas muscle, clipped, and cut. The gonadal vein is clipped and divided caudally near the inferior vena cava on the right and renal vein on the left. It is optional to remove the right gonadal vein in non-neoplastic scenarios since it does not participate in the right hilar pedicle. Follow the ureter superiorly to identify both the lower pole of the kidney and the renal hilum. On the right side the duodenum is kocherised until the IVC is clearly visualized. The kidney is mobilized with Gerota's fascia from surrounding structures. The upper pole of the kidney is dissected off the liver on the right side and off the spleen and tail of pancreas on the left side (Figure 1). Once the renal hilum is identified, the renal vessels are divided using an endovascular stapler (Figure 2). The renal specimen is then retrieved through a small incision and sent for histopathological examination.

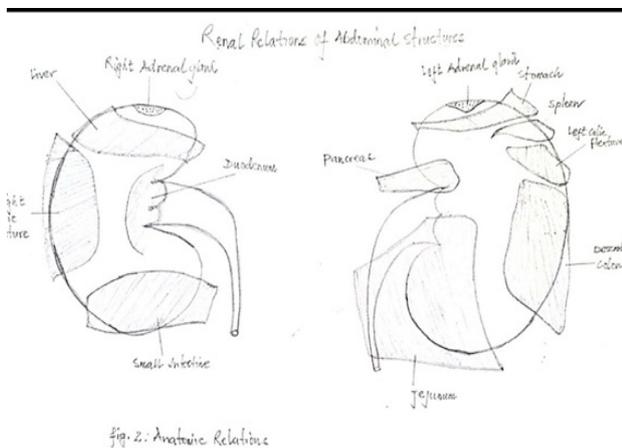


Figure 1: Anatomic relations of the kidney



Figure 2: Endovascular stapler at the left hilum

RESULTS

Twelve cases were recruited into the study. The minimum age was 27 years while maximum was 74 years. The male to female ratio was 2:1. The most common indication for nephrectomy was tumour and most patients presented with haematuria. The other symptoms were flank pain and mass. Most tumors, N(90%) after investigations were larger than 4cm.

The most common site of nephrectomy was on the right (66.3%). The average procedure time was 89 min and there was no significant blood loss reported (max 50 mls). Postoperative course was unremarkable in our patients and there were no significant morbidities reported. The average length of stay for our patients were 2.75+/-0.86 days.

Table 1: Patient characteristics, operative details and outcomes

Parameter	Value
Mean Age +/- SD	54.2 +/- 12.9
Gender No. (%)	
Male	8 (66.6%)
Female	4 (33.3%)
Presenting complaint No. (%)	
Pain	7 (58%)
Palpable mass	8 (67%)
Haematuria	5 (42%)
Indication for nephrectomy No. (%)	
Tumour	10 (83.3%)
Atrophic kidney	2 (16.7%)
Donor	0
Size of tumour No. (%)	
<4 cm	1 (10%)
>4 cm	9 (90%)
Site of surgery No. (%)	
Right nephrectomy	8 (66.6%)
Left nephrectomy	4 (33.3%)
Procedure time, min	89.4 +/-26..27
Perioperative complications No. (%)	
Bleeding	0
Fever	2 (17%)
Wound site infection	2 (17%)
Port-site hernia	0
Length of hospital stay (LOS), days	2.75+/-0.86
Postoperative histopathology No. (%)	
Obstructive atrophy	2 (16.7%)
Renal tumour	10 (83.3%)

DISCUSSION

The adoption of laparoscopic nephrectomy in our country and region is slow and taking longer than expected compared to our international colleagues. While laparoscopic nephrectomy has been demonstrated to be safe and associated with decreased complications, morbidity and length of hospital stay it still is underutilized mainly because of lack of equipment and learning curve required for technical expertise. Masoud *et al* (6) reported a minimum of 22 procedures are needed to adopt the technique of laparoscopic nephrectomy.

The aim of this study was to demonstrate the feasibility of LN and its associated acceptable good perioperative outcome. Although it has been demonstrated in settings with high volume centers to be technically feasible, there are no reports on the LN in our region. The LNs were performed by a single

laparoscopic urologist in a tertiary institutions in the city. Twelve nephrectomies were performed.

The demographic characteristics were similar to many reported in literature as most patients were young adults and gender comparison favored male patients. However, most common presentation in our study was either a mass on the affected site or pain upon which during examination revealed a palpable mass. This is different from reports from other studies in which most patients were presenting early with haematuria and the renal masses were small thus amenable to partial nephrectomy (16,17). The pathology specimens reported 83.3% of our specimens were malignant and the resection margins were clear while the rest were due to symptomatic atrophic non-functioning kidney.

The mean operative time was 89.4 ± 26.27 minutes which is less than reported in literature by other authors who noted a mean operative time of

was 140 ± 51.1 min (18). The range in operative time in different studies can be explained by the expertise of the operating surgeon and as well the type of operation being performed i.e. simple or radical oncologic nephrectomy (6,12). This operative time is shorter than in open nephrectomy which normally involves a long wound and dissecting several layers of muscle to gain access which are later sutured back (19).

There was no blood transfusion required in our patients, as there was no significant blood loss. This in part was aided by use of ligasure electrocautery during dissection and the hilum was controlled *en bloc* by an endovascular stapler. We also practiced restrictive transfusion strategy. This is a strategy commonly used in LN and is quite effective in reducing of transfusion requirement (20-22).

There were no mortalities in our study. The complications noted in our patients were wound site infection and fever in 2 patients. The concern usually is wound infection, fever, vascular injury, pleural injury (23, 24). The average length of hospital stay was 2.75 ± 0.86 , this is similar to findings by EL-Galley *et al* (25) who reported a mean of 2 ± 2 days hospital stay after LN. This is significantly shorter LOS compared to open nephrectomy. This has a significant benefit as patients require less analgesics and early resumption to their normal social lives, quicker return to work, reduced costs and risks of nosocomial infections (26). There have been no long-term surgical complications reported in our patients.

This study has demonstrated that LN is a feasible option in our setting and it is associated with shorter hospital stay and morbidity. There is a learning curve for trainees in order to reduce risk of complications and improve patient outcome in LN. Investment in laparoscopic equipment should be budgeted for especially in large tertiary referral hospitals. The current perception that LN is associated with higher cost financially may be false and a cost-effectiveness analysis should be undertaken to compare the LN and open nephrectomies as has been noted in developed countries (27-29). The limitations of this study were retrospective and the small sample size of the patients.

CONCLUSIONS

Laparoscopic radical nephrectomy has established its role as a standard approach to nephrectomy. It is associated with good perioperative outcome and thus a feasible option in our setting. Training is needed to improve the expertise of surgeons in the region.

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Impact of an international collaboration on hypospadias surgery in a tertiary teaching and referral facility in Kenya

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ABSTRACT

Background: Hypospadias is among the leading congenital urological anomalies. Access to subspecialist surgical care required to correct the anomaly is hampered in developing countries, principally by limited expertise. To address this challenge a 5-year international collaboration on hypospadias surgery was established between IVUmed and Kenyatta National Hospital (KNH), a national teaching and referral facility from the year 2011.

Objective: The aim of this study was to determine the impact of the urology training project on quality of care and outcomes of paediatric hypospadias patients attending KNH.

Method: The impact of the KNH urology projects on quality of hypospadias care and patient outcomes was assessed using a before-and-after design spanning a 15-year period (2000-2015) including a pre-project phase (2000-2010) and the urology training period (2011-2015). Data were obtained retrospectively from theater registers for assessment of surgical processes and patient outcomes and for the training period additional data on patients' perspective of quality were collected using Likert scale response items.

Results: In total 154 paediatric hypospadias cases operated in KNH between 2000 and 2015 including 56 (36.4%) cases in 2000-2010, and 98 (63.6%) cases in 2011-2015 were analysed. The mean (\pm SD) age of patients in the pre and post training periods was 3.4 (\pm 1.2) years and 3.9 (\pm 4.6) years, respectively. Proximal hypospadias were the most common type both in 2000-2010 (35/56, 62%) and 2011-2015 (57/98, 58%), $p = 0.549$. Use of TIP urethroplasty in KNH increased following the urology project from 23% (13/56) of hypospadias surgeries to 63% (62/98) during the training period (χ^2 (DF) = 22.9(1), $p < 0.001$). The rate of any complications declined significantly during the urology project from 79% (44/56) to 25% (24/98), $p < 0.001$. Out of the 33 parents who participated in the patient satisfaction survey conducted during the urological project, none reported strong dissatisfaction with information obtained from the surgeon before operation or with the items assessing satisfaction with anatomical features of the genitalia after surgery.

Conclusion: The KNH urology training project improved both patient care (use of recommended urethroplasty techniques) and outcomes (less complications, and reduced follow up duration). The model provides an effective and sustainable approach to imparting surgical skills required to improve hypospadias care through passing expertise gained by local trainees to peers.

Keywords: Urology training, Paediatric hypospadias patients

INTRODUCTION

The burden of paediatric surgical conditions requiring subspecialty surgical care in low and middle income countries is growing in line with increased survival during delivery, infancy and childhood. (Ref) It is estimated that between 6 and 12% of all paediatric admissions in sub Saharan Africa are attributable to surgical conditions (1). Approximately one in every five paediatric surgical admissions present with congenital anomalies requiring surgical repair (1). Congenital urological anomaly is common and occurs in 1-3 per 1,000 live births. A recent global review of the prevalence of hypospadias reported

major geographic, regional and ethnic differences in the rates with Africa and South America having lower mean prevalence (5.9 and 5.2, respectively) compared to Europe (19.9), North America (34.2) and Australia (17.1) (2).

There is contention as to whether the lower prevalence of hypospadias in Africa reflects the lack of data from the African region. Indeed in Kenya's largest national teaching and referral hospital, hypospadias is the most common urological congenital anomaly (KNH Hospital statistics, unpublished data). Despite the absence of adequate data on its epidemiology, hypospadias is considered a priority for healthcare resource allocation among

health professional in developing countries (3). In a comparative priority setting exercise health professional in a Kenyan surgical unit assigned higher disability weights to severe hypospadias compared to Canadian counterparts who instead ranked cleft lip and palate as priority conditions (3).

There exists large disparities in accessing surgical care and a growing unmet need for specialized surgical care in Kenya and other low income settings (4). Strengthening paediatric surgical education has been suggested as one of the elements in a four pronged approach to improving paediatric surgical care in developing countries (1,5,6). Increasing surgical knowledge at all levels of the health system from primary care upwards is desirable and arguably will yield greatest impact on healthcare but this requires significant resources which is a major hindrance to achieving this goal in resource constrained settings. Further, the initial gains of training human resources for health in low income countries are quickly offset by brain drain, more often to the countries of training.

As long term solutions to these training and surgical skills problems are explored collaborations targeting to impart skills to specialists who manage difficult cases has been suggested. The trainees from such programmes in turn train other providers in the local setup and also set standards in practice. At the beginning of the year 2011, IVUmed in collaboration with KNH paediatric surgery department initiated an international collaboration to train healthcare providers in urological surgery. The KNH urological project operations lasted five years but to date its impact has not been formally documented. The aim of this study was to assess the effectiveness of this collaboration on urologic care and patient outcomes.

MATERIALS AND METHODS

Study design

This assessment of the impact of the international surgical collaboration used a before-and-after design to determine the impact of the collaboration on hypospadias management, patient outcomes and parent/guardian perspective of quality of hypospadias care among paediatric admissions for surgical management of hypospadias in KNH. The collaboration was initiated in the year 2011 and thus evaluation was based on comparisons from two time periods 2000 to 2010 (before) and 2011 to 2015 (after).

The population eligible for inclusion in the analysis were all paediatric surgical patients (below 16 years) admitted in KNH over a 15-year period for corrective hypospadias surgery and for the period after the project data were also collected from parents

or primary caretakers accompanying the child during inpatient stay.

KNH urology project

The KNH urology project was initiated in the year 2011 as an institutional collaboration between KNH and IVUmed, an international organization training healthcare providers in surgical processes and specific urological procedures. The project allowed KNH practice-based surgical teams to learn from visiting surgical teams through training provided over a five-year period. The visiting team comprised over the period comprised of surgeons in different subspecialties including paediatric surgery, and urology but the core team supporting KNH was constituted by two international urologic surgeons (based in the United states and Sweden). During the project period a total of five annual visits were made to KNH by IVUmed project team in addition to student exchange programmes for trainees. Training was delivered using a workshop approach with visiting teams teaching as they treat patients and subsequent visits building on earlier training. Project's sustainability is ensured by empowering the trainees to train their peers.

A further benefit of the project was that it fostered an environment that promoted the use of collective experience of collaborators and data generated during the project to improve care and outcomes of children. This analysis presented here summarizes the impact of the project on quality of care and outcomes of children by comparing the period before and after the project initiation.

Data collection

For the period 2011 onwards data were obtained through inspecting theatre registers in KNH for entries of the urology projects while for the period preceding the urology project (2000-2010) data were identified through identifying paediatric admissions for hypospadias surgery from paediatric surgery theatre registers. Once eligible patients were identified from theatre registers, the inpatient number was used to retrieve files from the health information department and a data abstraction form designed for purposes of performing audits of hypospadias surgical care was used to obtain required data. The data abstraction forms collected information related to patient demographics, types of hypospadias, details of surgical procedures performed and immediate patient outcomes and follow up.

During the urology project, parents or caregivers completed a patient satisfaction questionnaire prospectively. The questionnaire contained 16

Likert scale items with responses on a four-point scale ranging from strongly disagree-1 to strongly agree-4. Fifteen items were related to post-surgical anatomical penile appearance and one item assessed communication from the surgeon prior to the procedure.

Data management and analysis

The data quality management plan included quality assurance measures such as training data collectors on procedure of data abstraction from the surgical records, and supervision of the data collection by a paediatric surgeon. Each questionnaire was inspected for completeness at the end of data abstraction and reference made to surgical notes to confirm that any information missing from the questionnaires were actually not documented in the notes. Data were entered into customized databases containing range, consistency and validity designed in IBM SPSS statistics software version 20. Data analysis involved descriptive analysis of calculation paediatric urology workload in the hospital by year and type of hypospadias repair, the characteristics of these cases, and percentage of patients managed

using different urethroplasty techniques, immediate patient outcomes including complications, treatment and follow up. The impact of the collaborative project was measured by calculating a difference in the proportion of patient outcomes in the period before and after the KNH urology project. Patient satisfaction in the post implementation period only was analysed using descriptive statistics mainly mean scores for responses on the Likert items and proportion of patients reporting different levels of satisfaction with care.

RESULTS

Data were obtained for a total of 154 hypospadias cases operated in KNH during the 15-year period in the analysis including 56 (36.4%) cases in 2000-2010, and 98 (63.6%) cases in 2011-2015. The mean (\pm SD) age of patients in the pre and post training periods was 3.4 (\pm 1.2) and 3.9 (\pm 4.6), respectively. Figure 1 shows age distribution of patients according to time period. In both periods the modal age group was 0-1 years and at least 50% of operations had been conducted by three years of age.

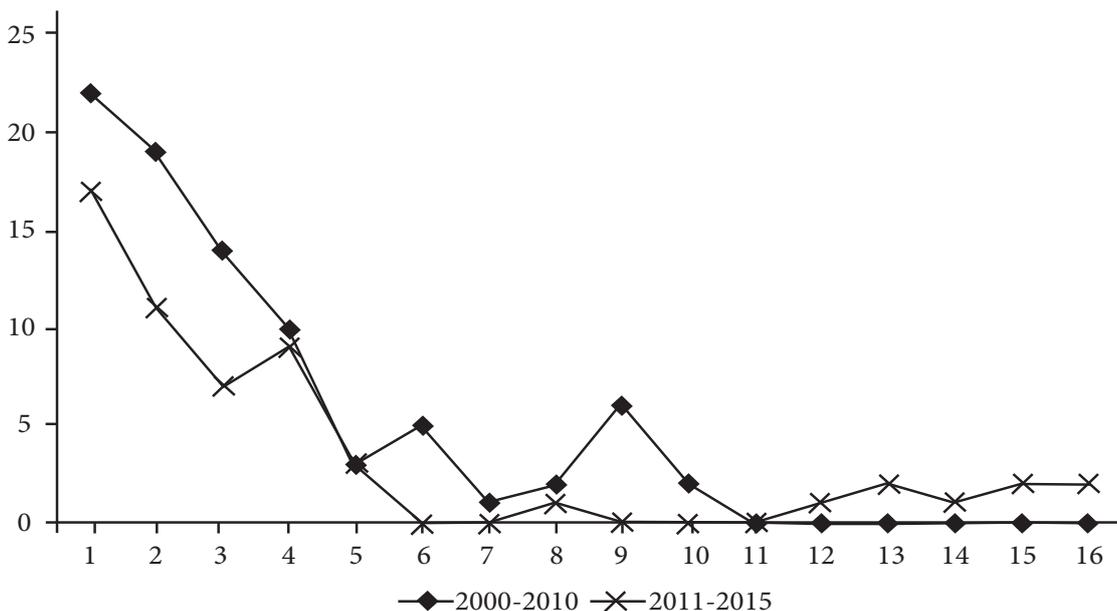


Figure 1: Age distribution of hypospadias patients at KNH according to urology project period

Table 1 presents the characteristics of hypospadias cases attended in KNH prior to and during the urology project. There was no significant difference in the presentation hypospadias in the period

before and during the urology project. Proximal hypospadias were the most common type both in 2000-2010 (35/56, 62%) and 2011-2015 (57/ 98, 58%), $p = 0.549$.

Table 1: Characteristics of paediatric hypospadias surgery cases attended in KNH prior to and after urology project

	2000-2010 (n=56)	2011-2015 (n=98)	χ^2 (DF)	P-value
Type of hypospadias				
Distal	21 (38%)	42 (42%)	0.36 (1)	0.549
Proximal	35 (62%)	57 (58%)		

Urethroplasty techniques

The use of TIP urethroplasty in KNH increased following the urology project from 23% (13/56) of hypospadias surgeries to 63% (62/98) during the training period (χ^2 (DF) = 22.9(1), $p < 0.001$), (Table 2). Insertion of stents for distal hypospadias also increases significantly during the project (23% to 88%, $p = 0.013$), however, the improvements in

catheter insertion was not statistically significant (71% to 96%, $p = 0.351$). Recommended suture material (PDS-6/0) were used in approximately 2% (1/56) patients before the project and this increased to 98% (96/98) during the training period (χ^2 (DF) = 137.2(1), $p < 0.001$). There was no documented case of hormone use during the training while there was evidence of hormonal administration (2%) in the pre-training period.

Table 2: Urethroplasty techniques prior to and after KNH urology training project

	2000-2010 (n=56)	2011-2015 (n=98)	χ^2 (DF)	P-value
Urethroplasty technique				
TIP	13 (23%)	62 (63%)	22.9 (1)	<0.001
Staged or other techniques	43 (77%)	36 (37%)		
Stents for distal hypospadias (n = 63)	5/21 (23%)	37/42 (88%)	6.21(1)	0.013
Catheter for proximal hypospadias (n = 92)	25/35 (71%)	55/57 (96%)	0.87(1)	0.351
Suture material (PDS-6/0)	2/56 (4%)	96/98 (98%)	137.2(1)	<0.001
Androgen use*	1/56 (2%)	0/ 98 (0%)	NA	NA

The occurrence of any surgical complication and that of specific complications declined significantly during the urology project (Table 3). Prior to the urology training project 79% (44/56) of surgeries were associated with complications compared to 25% (24/98) in the training period (χ^2 (DF) =

42.3(1), $p < 0.001$). The duration of follow up also reduced significantly from an initial 21% (12/56) follow up duration in less than one year to 60% (59/98) having similar follow up durations in the training period, $p < 0.001$.

Table 3: Complications and follow up of hypospadias surgery before and after KNH urology training

	2000-2010 (n=56)	2011-2015 (n=98)	χ^2 (DF)	P-value
Any complications	44 (79%)	24 (25%)	42.3(1)	<0.001
Fistula	24 (43%)	12 (12%)	18.6(1)	<0.001
Total breakdown	8 (14%)	4 (4%)	5.16(1)	0.023
Partial breakdown	4 (7%)	-	NA	
Follow up duration less than one year	12 (21%)	59 (60%)	21.6(1)	<0.001

Out of the 33 parents who participated in the patient satisfaction survey conducted during the urological project, none reported strong dissatisfaction with information obtained from the surgeon before operation or with the items assessing

satisfaction with anatomical features of the genitalia after surgery. The levels of satisfaction were high ranging from 69.7% for meatal shape to 96.1% for penile torsion/ orientation (Table 4).

Table 4: Parental satisfaction with hypospadias care during the urology project

	Disagree	Agree	Strongly agree
Parent reported being satisfied with:			
Meatal location	9 (27.3)	18 (54.5)	6 (18.2)
Meatal shape	10 (30.3)	20 (60.6)	3 (9.1)
Urinary stream	8 (24.2)	18 (54.5)	7 (21.2)
Erection/ curvature	4 (12.1)	26 (78.8)	3 (9.1)
Penile size	2 (6.1)	29 (87.9)	2 (6.1)
Penile thickness	1 (3.0)	30 (90.9)	2 (6.1)
Glandular size	4 (12.1)	29 (87.9)	0 (0.0)
Glandular shape	7 (21.2)	26 (78.8)	0 (0.0)
Penile scars	4 (12.1)	27 (81.8)	2 (6.1)
Scrotum appearance	4 (12.1)	6 (18.2)	23 (69.7)
Testis location	4 (12.1)	5 (15.2)	24 (72.7)
General appearance	4 (12.1)	26 (78.8)	3 (9.1)
Length of penis	2 (6.1)	28 (84.8)	3 (9.1)
Shape of penile skin	7 (21.2)	24 (72.7)	2 (6.1)
Penile torsion/ orientation	1 (3.1)	27 (84.4)	4 (12.5)
Information from the surgeon before operation	7 (21.2)	22 (66.7)	4 (12.1)

DISCUSSION

The analysis of paediatric hypospadias care provided in KNH between 2000 and 2015 demonstrates a clear positive impact of an international collaboration on critical areas of care and patient outcomes. There was an increase in the use of TIP urethroplasty from 23% before the urology training to 63% during training. In spite of the absence of a comparable control there are several possible explanations for attributing changes in urethroplasty techniques to urology training. Firstly, during the entire 10-year period preceding the project there were low relatively stable rates of TIP utilization followed by a sustained increase in TIP urethroplasty. This increase corresponded to the number of visits and duration of urology training yielding a dose-response relation and providing a robust basis for attributing this change in urethroplasty technique to the urology training project. Secondly, apart from the change in urethroplasty technique there was a consistent improvement, both in magnitude and direction of change, for other indicators of urology care and patient outcomes selected for monitoring project impact. For example, overall complication rates reduced from 79% to 25%. The consistency in performance for the range of urology indicators in the two time periods provides further evidence for attribution of the changes to the urology training project. Thirdly, the findings reported in the KNH urology project are consistent with literature and in particular they are in line with recent reports from a comparable project implemented in Malawi on

the impact of long term institutional collaborations in surgical training on trauma care that showed improved quality of trauma care, increased capacity for training surgeons through a sustainable and scalable model (7).

The improvements in practice related to hormonal use and catheter insertion for proximal hypospadias are noteworthy because unlike the other areas of care the changes in these two areas did not attain statistical significance. For catheter insertion it is important to note the relatively high performance in the period before the project was initiated. In deed catheter insertion for proximal hypospadias was the area with the best performance among the reviewed areas in the period prior to the urology project. This high performance during the baseline period limits the scope available for improvement in this area in comparison to other areas and has been described extensively in literature on quality improvement interventions in clinical practice (8,9). Regarding hormonal use it is notable that no hormonal use was documented during the training but the non-significant decline in hormonal administration point to the observation that this inappropriate practice existed prior to training although it was not widespread.

The design of the urology training project implemented in KNH provides the main strength of this investigation. Two aspects of the training model adopted that make it attractive are prior consideration of sustainability of the training and also training healthcare providers within their local setup. For the analysis stage, the use of an analytical

design in demonstrating the project impact, and use of contextual information to help interpret the findings of the analysis from the project assisted in demonstrating a link between the training and its effects. Among the main limitations of the study are the absence of control group data in the analysis. However, contextual information and plausibility arguments have been used in interpreting the results and attributing changes to the project. The study demonstrated effectiveness of the project but additional analysis using cost data will help in arriving at the cost-effectiveness of the intervention and basic costing data from both periods can aid in decision making on scalability of the training.

Authors contribution

All authors (Dr F Osawa, Dr P Mwika and Dr J Litiku) participated in the design of the study and the interpretation of data. Dr F.Osawa drafted the manuscript. All authors critically revised the manuscript and have approved the final version for publication

Conflict of interest

The authors declare no conflict of interest.

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Insight on medical practitioners' knowledge on management of undescended testis in Kenya

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ABSTRACT

Objective: The aim of this study was to look at the insight and knowledge of medical practitioners in Kenya on management of undescended testis mainly looking at their knowledge in the diagnostic modality, timing of surgery and the indications for surgery.

Method: This study was a cross sectional survey conducted among health workers all over the country using an electronically shared questionnaire. The respondents were of different specialities and had different level of training/experience. All respondents were allowed to remain anonymous.

Results: Two hundred and eighty one health practitioners enrolled for the study. One hundred and sixty three (58%) and 11% consultants. Most (34%) respondents were from the surgical discipline. Forty nine point seven percent use physical examination for the diagnosis of undescended testis (UDT) while 44.5% recommend use of ultrasound for the diagnosis of UDT. Twenty five percent of the health workers indicated 2 years as the time of surgery, 19.6% 12 months and 16.4% 6 months. Two hundred and forty two (86.1%) respondents indicated association of UDT with infertility. Sixty nine point eight percent outlined the metaplasia as a risk and therefore indication for surgery. Eighty six (30.6%) indicated the increased risk of testicular torsion as an indication for surgical correction.

Conclusions: Health workers are not familiar with the current guidelines on diagnosis, timing of surgery and the indications for orchidopexy. Currents management guidelines should be disseminated to all health workers of different specialities via publications, continuous medical learning and hospital campaigns. Management protocol for UDT should also be formed to harmonize management.

Keywords: Undescended testis, Guidelines, Health workers

INTRODUCTION

Undescended testis (UDT) or cryptorchidism refers to testis that is not normally located at the bottom of the scrotum (1). It is the most common congenital malformation in males neonates with varying incidence depending on gestation age, affecting 1.0-4.6% full term and 1.1-45% preterm neonates (2) Embase, Cinahl and the Cochrane Library. Any study reporting on the frequency of UDT was included. Study population age, number of boys studied, period of examination, primary examiner, area of study, study design, ethnicity, definitions used and previous testicular position were analysed. A total of 46 studies met the inclusion criteria. Twenty-three of the 46 (50%). Up to 30% of undescended testis are bilateral (3). The aetiology of undescended testis is considered multifactorial (genetic, maternal, environmental) and it occurs in most cases as an isolated case with no obvious cause. Clinical management is decided on the location of the testis whether its palpable or non-palpable with up to 80% of testis being palpable (4).

Diagnosis of undescended testis is based on history and clinical examination. A spontaneous descent may occur in the first 6 months of life and if this fails an orchidopexy is recommended. Early treatment is recommended to reduce the associated risk of infertility/subfertility and testicular cancer (1). Despite several systemic reviews and studies on diagnosis modality and time of surgery, controversies exist. Delayed presentation and conflicting advise given by the healthcare workers in management of undescended testis have been observed and this contributes to the difference in diagnosis and treatment (5). In Kenya, there has been varied time of presentation of patients with undescended testis with one study finding an average age of presentation at 9 years (6). The role of the care givers in the diagnosis and management of UDT has however not been established. This study aimed at looking on the insight and the knowledge of the health workers in diagnostic modalities, the indications of surgery and timing of surgery in patients with undescended testis.

MATERIALS AND METHODS

This study was a cross sectional survey that was conducted among health workers including, consultants, residents, medical officers, clinical officers and nurses of different speciality in the country. A total of 281 health workers participated. This was done using a questionnaire that was generated and shared electronically among the participants. Respondents were allowed to remain anonymous. There were no language restrictions. Consent to participate in the study was sought from every participant before enrolling for the study.

RESULTS

Demographics

A total of 281 medical practitioners of different areas of speciality participated in the study. Majority, 163 of the 281 (58%) were medical residents, 81 (28.8%) were medical officers and 31 (11%) were consultants. Four (0.7%) clinical officers and 2 (0.35%) nurses participated in the study. The study included both primary care givers including, general practitioners and family physicians and specialised services providers including paediatricians and surgeons.

Of all the participating medical officers, residents and consultants from the surgical discipline were the majority 34%. General practitioners accounted for 24.1% with paediatricians and family physicians 11% and 2.8% respectively.

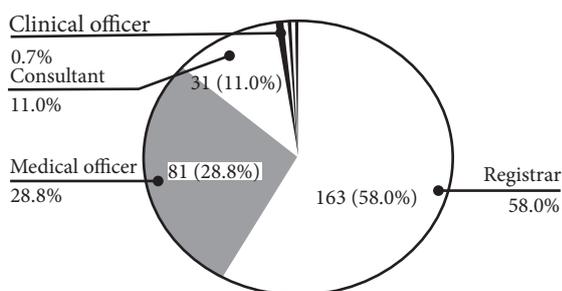


Figure 1: Level of education

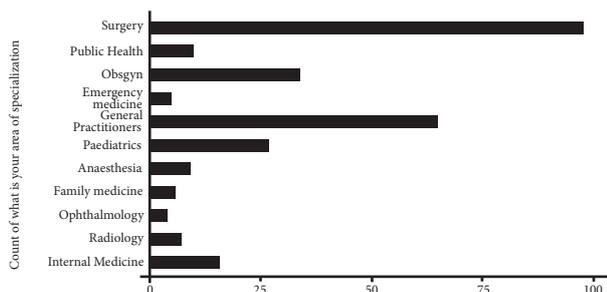


Figure 2: Area of specialization

One hundred and thirty nine (49.7%) of the participants chose history and clinical examination as the diagnostic modality in patients with UDT. One hundred and twenty five (44.5%) chose ultrasound as the modality of choice in diagnosis of UDT while 10 (3.6%) chose magnetic resonance imaging (MRI).

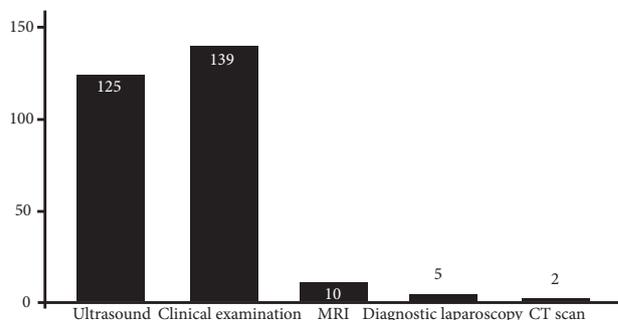


Figure 3: Diagnostic modality

Indications of surgery

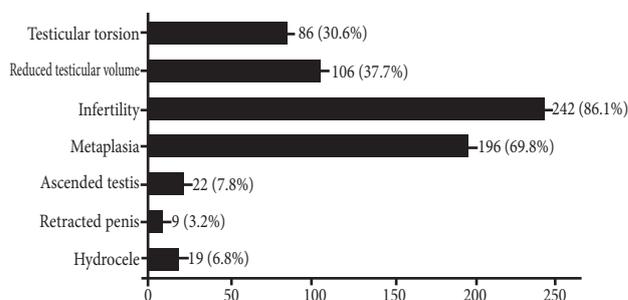


Figure 4: What are the complications of untreated undescended testis? (Tick where appropriate) 281 responses

Of the 281 participants, 242 (86.1%) participants knew infertility to be one of the complications of untreated undescended testis and is in indication for treatment. One hundred and ninety six (69.8%) participants highlighted the risk of metaplasia in patients with untreated undescended testis.

Timing of surgery

There was a wide range of difference in participant's knowledge on the timing of surgery. The earliest time indicated was immediately at birth with some indicating 72 months of age. Twenty five percent of the participants chose 24 months as the indicated time of surgery; this was the most common choice. Fifty five (19.6%) participants chose 12 months and 46 (16.4%) chose 6 months as the indicated time of surgery.

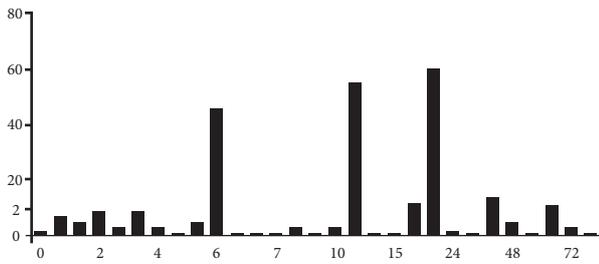


Figure 5: Time of surgery in months

DISCUSSION

Undescended testis (UDT) is the most common male congenital malformation and patients with UDT are seen by medical practitioners of different specialities.

Li Yan Lim *et al* (7) study shows deficiency in knowledge of healthcare workers of different levels of specialization on management of UDT and this affected the time and type of management.

In this survey, a total of 281 medical practitioners were included and of the majority 58% were postgraduate residents in different areas of specialization. Residents and consultants specializing in surgery were 34% and this were the majority in the study. Primary physicians including the general practitioners, family physicians and paediatricians were a total of 37.9 %. These group of medical practitioners attend to patients with UDT before referring to surgical specialists.

Diagnostic modality

One hundred and thirty nine medical practitioners from this survey diagnose UDT by use of history and physical examination. However, up to 44.5 % do ultrasound for diagnosis of UDT. These however, contradicts available guidelines and recommendations. Hrebinko *et al.* (8) looked at the role of radiographic imaging in the diagnosis of UDT and found an overall accuracy of 44% with imaging. Physical examination done by referring physicians had an accuracy of 53% and 84% when done by a paediatric urologist. Shah *et al.* (9) found comparable results with sensitivity of ultrasound and MRI being 60% and 55% respectively hence having very limited role in the diagnosis of UDT.

Imaging including ultrasound and MRI can however be used In the diagnosis of specific clinical scenarios for example in patients suspected to DSD, it can be used to identify remnants of Mullerian structures (10).

Imaging studies do not change the management of UDT. Subjecting patients to imaging, delays time of referral to the surgical specialists and subjects the patients to unnecessary costs that increases the medical expenditure (10) Laparoscopy should be used in patients with non-palpable testis (11).

Timing of surgery

This survey found that medical practitioners in Kenya do not have the knowledge as to when orchidopexy should be done. Twenty five percent of the medical workers in this study indicated that surgery should be done at 2 years of age. Only 16.4% recommended orchidopexy at 6 months and another 19.6 % at 12 months. This findings were in keeping to those found by Lim *et al.* (7) study where he found that majority of the health workers refer UDT after 9 months and recommend orchidopexy after 1 year(. Ekwunife *et al.* (12) reported only 5.1 % of patients to have an orchidopexy within the first year and 23.1% by 2 years.

Spontaneous descent of the testis occurs within the first 6 months of life and no further descent is expected after 6 months. Orchidopexy is therefore recommended after 6 months (13). In addition, catch up growth of the testis is observed after an early descent of the testis which does not occur in delayed testicular descent (14). Twenty five percent of patients with UDT will have fertility issues despite orchidopexy done within the first year of life. This is according to a study by Hildorf *et al.* (15) where they looked at hormonal profile and histology findings. Consensus by the European association of urology is that orchidopexy should be done between 6 months and 12 months.

Indications of orchidopexy

From this study, majority (86.1%) of all the medical practitioners indicate infertility as reason to do an orchidopexy. Sixty nine point eight percent of the all the doctors indicated metaplasia and risk of testicular tumour as an indication for surgery. However, only 30% highlighted the risk of testicular torsion in patients with UDT and therefore majority did not know there is an actual risk of testicular torsion in patients with UDT. From the above results the indications and also the complications that occur due to UDT is not well known among health workers despite it being a common male congenital disorder. Increased risk of trauma and psychological effect

associated with UDT was however not looked in this study. UDT has been associated with impaired spermatogenesis and endocrine function. The incidence increases with delayed testicular descent (16).

There is also documented 2-8 increase fold in testicular cancer in patients with UDT. This is dependent on the location with inguinal UDT having a 1% risk compared to 5% risk in abdominal non-palpable UDT. The risk of metaplasia and development of testicular cancer increases with age with up to 32% in post pubertal boys with UDT with some studies reporting 40% risk in adults patients with UDT (17).

CONCLUSION

This survey shows that only 35% of medical practitioner recommended below 12 months as the time of orchidopexy for UDT with a big number 44.5 % performing imaging modalities to diagnose UDT. Outdated recommendations of timing of surgery are still being practised by some health workers. We also observe that most authors associate UDT with infertility 86.1% but are not well conversant with other complications associated with UDT.

RECOMMENDATION

Awareness among health workers on the management trends and new guidelines should be done among all health workers. This information should be disseminated continuously using various methods including publications, continuous medical learning and medical campaigns. Management protocol for use within the country should also be created to ensure uniformity in the management of these patients.

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Association of preconception maternal hormonal contraceptive use and development of undescended testes in children at Kenyatta National Hospital

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ABSTRACT

Background: Descent of the testis is a developmental process to ensure that the mature testis promotes normal spermatogenesis. Androgens play a role in this process. The use of hormonal contraceptives (HC) before conception may have an effect on testicular descent due to their antiandrogen activity. This study evaluated the possible association of preconception maternal hormonal contraceptive use and undescended testis (UDT) in children at the Kenyatta National Hospital (KNH).

Objective: To assess the association between preconception use of hormonal contraceptives and the development of undescended testes in children at KNH.

Materials and methods: A comparative cross sectional study on children with undescended testes seen at the KNH paediatric surgical outpatient clinic was carried out over a duration of six months, an equal number of a comparison group of children with normally descended testis was also studied. Data on the social, demographic factors, contraceptive use, obstetric history and other comorbidities was collected using a pre-tested questionnaire and analyzed using IBM SPSS statistics version 21. Bivariate analysis was done using chi-square and t-test and multivariate analysis using logistic regression. The level of significance was set at 0.05.

Results: Sixty-two children with a median age of 3.5 years (IQR 2.0-8.0 years) meeting the inclusion criteria and a comparison group of 81 children with a median age of 3.3 years (IQR 1.3-7.0 years) with normally descended testes, were studied. Factors found to have a significant association to the development of UDT included: mean age of the mothers (27.8 years for cases vs. 31.1 years, $p=0.001$), prim gravida (25.8% for cases vs. 12.3%, OR 2.5 (95% CI 1.0-5.9), $p=0.039$) and less than 1-month duration between the use of contraceptive method and conception (23.8% for cases vs. 4.5%, OR 7.3 (95% CI 1.8-30.6), $p=0.006$). Also, those with duration between 1 to 3 months were at a significant risk of having children with UDT, (OR 3.3 (1.0-11.0), $p=0.051$).

Conclusion: Hormonal contraceptive use is widespread among women of child bearing age in Kenya. A shorter duration between the last use of hormonal contraceptives and conception is a significant association in the development of UDT. Younger mothers and prim gravida were also found to be significant associations in this study.

Keywords: Contraceptives, Undescended testis, Obstetrics history

INTRODUCTION

Cryptorchidism is a common congenital malformation in males with prevalence from 4 to 42 per 10,000 births. Recent reports have suggested an increase in its prevalence over time in various countries attributed to environmental factors (1).

Testicular descent takes place in two phases. In the trans abdominal phase, the testes descend from their intra-abdominal position to the groin during

first trimester under the influence of Insulin-like factor 3 which is inhibited by 17α and β -estradiol in embryonic Leydig cells. In the inguinal-scrotal phase from gestational week 26–35, regression of the gubernaculum induced by androgens and abdominal pressure pushes the testes through the inguinal canal. Accordingly, estrogens are expected to cause intra-abdominal maldescent while anti androgens would cause inguinal maldescent (2).

High level of estrogen during fetal life may disturb the endocrinological control of the male fetal urogenital organs. The rise in estrogenic exposures may originate from different sources such as the introduction of synthetic estrogens in oral contraceptives, changing diet with a higher content of phytoestrogens as in soy products, increasing dietary products based on cow's milk and a rise in industrial chemicals containing estrogenic properties (3).

Factors that are known to predispose to cryptorchidism include: prematurity, low birth weight, small size for gestational age, twinning, maternal exposure to estrogen during the first trimester, family history, genetics, conditions associated with decreased intra-abdominal pressure, exposure to endocrine disrupting chemicals (4).

The role of preconception hormonal contraceptive use in failure of testicular descent in children with undescended testes seen at the Kenyatta National Hospital has not been studied before and is not known.

MATERIALS AND METHODS

This was a cross sectional study at the paediatric surgical outpatient clinic (PSOPC) at KNH of all paediatric patients with either unilateral or bilateral undescended testes who had met the inclusion criteria and a comparative group of Paediatric patients with normally descended testes seeking treatment for other conditions other than that related to undescended testes. All children between 30 days and 13 years referred to PSOPC with a diagnosis of undescended testes and whose biological mother was available were included.

Selection of both groups was by non-randomized consecutive sampling of eligible patients until the desired sample size was achieved. The sample size was calculated using fishers formula corrected for a finite population of 70 children with cryptorchidism (5,6). It was powered to detect hormonal contraceptive use of 29% at a confidence interval of 95% with a 5% margin of error. A minimum of 58 children with undescended testes was sampled and an equal number of a comparison group was selected.

A pre-tested questionnaire was administered to mothers of recruited children after obtaining an informed consent. Data on contraceptive use

and comorbidities was collected. The dependent variables were: use of contraceptives, duration of use of contraceptives before the current birth and related comorbidities. A physical examination of the external genitalia of the child was also conducted and the findings recorded on the questionnaire.

Data was analyzed using IBM SPSS statistics (version) 21. Descriptive analysis was done using frequencies and proportions for categorical variables and measures of central tendency such as mean and standard deviation for continuous variables. The Chi square test of associations was used to determine any association between use of hormonal contraceptives and undescended testis. Means for the continuous variables was compared between the study and the comparison group using independent t test. Multivariate analysis to assess association between multiple factors and undescended testis was done using logistic regression analysis. All statistical tests were performed at 5% level of significance.

RESULTS

A total of 62 children with undescended testes were enrolled with a median age of 3.5 years (IQR 2.0-8.0 years) and the mean age of their mothers was 27.8 years (SD 4.9 years). A similar number of a comparison group had significantly older mothers ($P=0.001$) with a mean of 31.1 years (SD 5.4 years).

Use of contraceptives was not significantly different between the cases (67.7%) and comparison group (76.5%), $p=0.242$. The type of contraceptive methods used was not significantly different between the two groups ($p>0.05$). In addition, the mean age in years at first use of contraception was 23.6 years for the cases and 24 years for the comparison group ($p=0.496$). The interval between use of contraceptive method and conception was significantly associated with undescended testes. Mothers of children with undescended testes were more likely to have used contraceptives with less than 1-month interval before conception (23.8%) compared to the comparison group (4.5%), OR 7.3 (95% CI 1.8-30.6), $p=0.006$. Also, mothers who were on contraceptives between 1 to 3 months before conception were at a significant risk of having children with undescended testes, OR 3.3 (1.0-11.0), $p=0.051$.

Table 1: Contraception characteristics of the mother

Variable	Case n (%)	Control n (%)	OR (95% CI)	P-value
Family planning use				
Yes	42 (67.7)	62 (76.5)	0.6 (0.3-1.3)	0.242
No	20 (32.3)	19 (23.5)	1.0	
Pills				
Yes	18 (29.0)	31 (38.3)	0.7 (0.3-1.3)	0.249
No	44 (71.0)	50 (61.7)	1.0	
Depo				
Yes	16 (25.8)	21 (25.9)	1.0 (0.5-2.1)	0.987
No	46 (74.2)	60 (73.8)	1.0	
Implant				
Yes	5 (8.1)	10 (12.3)	0.6 (0.2-1.9)	0.408
No	57 (91.9)	71 (87.7)	1.0	
Other FP method				
Yes	7 (11.3)	3 (3.7)	3.3 (0.8-13.4)	0.102
No	55 (88.7)	78 (96.3)	1.0	
Mean age in years at first use of contraception (SD)	23.6 (3.5)	24.0 (3.1)	-	0.496
Duration of contraception (months)				
<1	10 (23.8)	3 (4.5)	7.3 (1.8-30.6)	0.006
1-3	9 (21.4)	6 (9.0)	3.3 (1.0-11.0)	0.051
3-6	4 (9.5)	8 (11.9)	1.1 (0.3-4.2)	0.890
6-12	4 (9.5)	17 (25.4)	0.5 (0.2-1.8)	0.301
>12	15 (35.7)	33 (49.3)	1.0	

Multivariate analysis: Factors independently associated with undescended testes

While controlling for age of the mother and primigravida, less than 1 month interval from use

of contraception method to conception was independently associated with undescended testes in children (OR 6.0 [95% CI 1.4-25.7], p=0.016).

Table 2: Factors independently associated with undescended testes

Variable	Adjusted OR (95% CI)	P-value
Maternal age in years	0.93 (0.85-1.02)	0.126
Parity		
Primi	1.0 (0.2-4.9)	0.994
Multi	1.0	
Duration of contraception (months)		
<1	6.0 (1.4-25.7)	0.016
1-3	2.9 (0.9-10.1)	0.086
3-6	1.1 (0.3-4.2)	0.920
6-12	0.5 (0.1-1.7)	0.262
>12	1.0	

DISCUSSION

Cryptorchidism is one of the most common congenital malformations in males. In recent years a number of studies have shown an increase in prevalence of cryptorchidism over time (5). This increasing trend raises the question whether cryptorchidism may be caused by endocrine disrupting chemicals before or during pregnancy. Hormonal contraceptives are known to have endocrine disrupting effects (7).

Use of contraceptives was not significantly different between the cases (67.7%) and comparison group (76.5%), $p=0.242$. Depue *et al.* 1984 reported that *in utero* exposure to external estrogens was significantly associated with the elevated risk for cryptorchidism(8), but some other studies (Beard *et al.* 1984; Davies *et al.* 1986) have also shown no significant relationship of *in-utero* estrogen exposure to cryptorchidism (9,10). Other investigators have found no evidence of an association between UDT and *in utero* exposure to other estrogens other than DES. McBride *et al.* (1991) found no significant association between exogenous estrogen exposure (oral contraceptive use and female hormones) or indirect indicators of endogenous estrogen exposure (such as bleeding, nausea, and vomiting) and cryptorchidism (11).

This study did not find a significant difference in the type of contraceptive method used, the mean age at first use of contraceptives between the mothers of the cases and the comparison group.

However few studies have examined the role of preconception hormonal contraceptive use on the outcome of subsequent pregnancies. Earlier studies did not fully explore the timing, duration or formulation of the hormonal contraceptives. Hormonal influence of hormonal contraceptives persists after discontinuation, this could be one possible mechanism by which preconception use of hormonal contraceptives influence descent of the testes (12)

Duration between use of contraceptive method and conception was significantly associated with undescended testes. Children with undescended testes were more likely to have mothers with less than 1-month duration (23.8%) compared to the comparison group (4.5%), OR 7.3 (95% CI 1.8-30.6), $p=0.006$. Also, those with duration between 1 to 3 months were at a significant risk of having children with undescended testes, OR 3.3 (1.0-11.0), $p=0.051$. While controlling for age of the mother and Primigravida, less than 1 month duration from use of contraception method to conception was independently associated with undescended testes in children (OR 6.0 [95% CI 1.4-25.7], $p=0.016$).

This corresponds to findings by Xi- Kuan Chen *et al.* (13), who although did not directly explore the association with UDT found adverse birth outcomes (very low birth weight, low birth weight and preterm births) among women who used hormonal contraceptives in the 30 days before their LMP. No increase in risk was seen in women who used oral contraceptives 31–90 days prior to the LMP. A somewhat similar finding was reported by Pardthaisong and Gray *et al.* who found that the risk of low birth weight was increased for accidental pregnancies with fetal exposure to oral contraceptives (OR: 1.5, 95% CI: 1.2, 2.0).

A plausible explanation for these findings is that once hormonal contraceptives use is discontinued it is uncertain how long the effects of the hormones last and whether there may be harmful effects of these circulating hormones to the developing foetus. Significantly greater percentages of free and albumin bound estradiol have been found in the first trimester sera of mothers with cryptorchid boys (14). Mucci *et al.* (15). found no significant differences between preconception oral contraceptive ever and never users with respect to the levels of the studied hormones at week 16 of gestation, although a suggestive increase of progesterone may deserve some attention. At week 27, however, both oestriol and progesterone were elevated in the serum of preconception users of oral contraceptives compared with never users. The main argument against estrogens as potential factors in impaired testicular descent is the lack of persistent Mullerian structures in affected humans (16).

CONCLUSION

This study shows that the time interval between the most recent use of hormonal contraceptives and conception could be associated with cryptorchidism, where the risk increases with decreasing time interval. No specific type of hormonal contraceptives used was found to have a significant association with undescended testis in comparison to the others.

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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A glance at psychological effects of nocturnal enuresis in children as seen at the Kenyatta National Hospital: Case studies

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ABSTRACT

Nocturnal enuresis is one of the most common urological complaints in children. Its incidence is reported to be about 5.7 million in the United States. The overall prevalence decreases with age. Psychological issues have been linked to the development and as a consequence of nocturnal enuresis which has led to poor self-image, social interaction and academic performance. Higher rates have been recorded with prolonged treatment periods and treatment failures. We present two cases of patients who as a result of psychological distress due to nocturnal enuresis, inflicted self-harm to their penis resulting in injury to the urethra requiring surgical intervention. We highlight these cases to emphasize on multidisciplinary approach in management of these patients in order to avoid such cases.

Keywords: Nocturnal enuresis, Psychological effects, Self-harm

INTRODUCTION

Nocturnal enuresis is defined as night time episodes of urinary incontinence in children aged 5 years and above without having any neurological disease, and occurs at least twice weekly for a period of at least 3 months (1,2). It is reported to have a prevalence of 8% at 9.5 years of age in Britain whereas 16% of children had nocturnal enuresis (NE) in a study done in South Africa with the prevalence decreasing with age (3,4). There is a higher prevalence among the male gender with 6.21% in males compared to 2.51% in girls. Males were reported to have a higher severity of the disease. Patients with a maternal history of nocturnal enuresis are 3.6 times more likely to have severe nocturnal enuresis compared to 1.85 times for those with paternal history of the same (5)

Enuresis can be divided into mono-symptomatic (MSE) and non-monosymptomatic (NMSE) enuresis where MSE is isolated enuresis without lower urinary tract symptoms and NMSE is associated with lower urinary tract symptoms. MSE is further divided into primary MSE in a child who has not had a dry period of at least 6 months and secondary MSE where there is a history of previous dry period of more than 6 months (1).

The pathophysiology of NE can be explained by the three system model proposed by Butler and Holland which points to 3 major causative factors including nocturnal polyuria which has been associated with abnormal diurnal variations of antidiuretic hormone, detrusor over activity and abnormal sleep patterns (Figure 1) (6).

In patients with severe NE of more than 5 episodes per week, the brain arousability is postulated to be affected due to overstimulation from bladder signals that suppress the function of the arousal center, which results in a lighter sleep with difficulty in complete awakening (7) there are conflicting data with regard to sleep patterns in children with enuresis.2,3 Nocturnal enuresis often occurs with unstable bladder contractions in conjunction with polysomnographic changes from deep sleep to lighter sleep but without full awakening,4 suggesting that a relationship may exist between bladder overactivity and deranged arousability. We therefore investigated sleep patterns and cortical arousal in relation to bladder activity in children with severe enuresis. Children with primary nocturnal enuresis that was severe and refractory (≥ 5 wet nights per week.

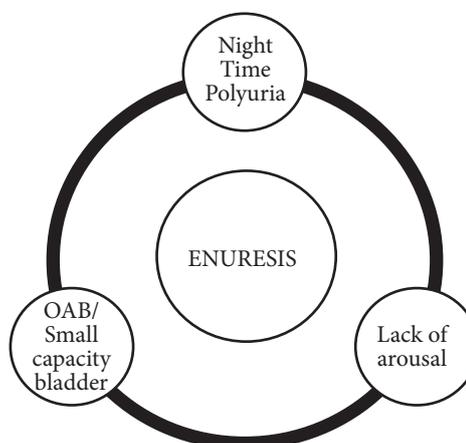


Figure 1(1): Butler and Holland NE model (1)

Different treatment modalities have been used depending on the cause of NE, these include urotherapy, pharmacological treatment with desmopressin or anticholinergic drugs and alarm therapy (1).

Psychological issues are known to be causative factors in NE and may co-exist with the disease. Clinical conditions associated with NE include attention deficit hyperactive disorder, anxiety, depression and autism. Patients may have psychological effects of the disease such as feeling of guilt, humiliation, sadness. These may present as social withdrawal and lack of confidence in children which has adverse effects on their social growth at a critical period of development. Psychological screening modalities that can be used in the evaluation of patients include short screening instrument for psychological problems in enuresis (SSIPPE) and child behavior checklist (CBCL).

Case report 1

M.N was a 9 year old boy with Primary MNE who presented to our facility with penile injury. The patient had reported more than 4 episodes of NE per week sighting difficulty in arousal from sleep. Different measures had been sought to try and manage the disease at home such as fluid restriction in the evening, being woken up to micturate at night and timed voiding before bed. Previous medications prescribed at a peripheral facility reported minimal improvement and had since been stopped. Report of ridicule from his friends and sibling due to his condition took a toll on his self-confidence and performance at school. The parents report of self-isolation, falling of grades at school and lose of interest in sports activities. Although of concern to the parents, they did not seek further medical assistance but opted to wait for resolution of symptoms with advancement of age.

The patient reported of tying the base of the penis with a thread in order to curb the nocturnal enuresis. He did not report of this despite swelling of the penis for more than 12 hours.

At presentation the penile shaft was edematous with urine leaking from the site of constriction. (Figure 2). Upon examination under anaesthesia, a sewing thread was found at the penile shaft which had torn through the corpus spongiosum with partial injury to the penile urethra.

Debridement, cystoscopy and catheterization were done followed by urethroplasty at a later date. Counselling was done to the patient and family members with follow up on urotherapy and pharmacological treatment for nocturnal enuresis.



Figure 2 a, b: Wound from self inflicted penile trauma in a child with NE

Case report 2

A.K was an 8 year old boy who presented with a history of self-inflicted injury to the penis in the background of Secondary MNE. The patient had used a thread to tie the shaft of the penis so as to manage nocturnal enuresis. There was a history of having a dry period for a year at the age of 4 years. Psychological triggers noted were separation of the parents with a change in economic status of the family and change of residence. The patient was on anticholinergics on and off with minimal improvement. Other modalities such as alarm therapy and fluid restriction had also been instituted with minimal improvement. Report of previous attempts at tying the penile shaft had 'failed'. The patient reported feeling shunned and punished to wash his beddings daily, coupled with ridicule from his age mates for his condition and thus, tried to stop himself from urinating at night by tying off his penis. The patient initially presented at a peripheral facility with urinary obstruction, pain and bleeding from the penile shaft. A suprapubic catheter was inserted.

At Kenyatta National Hospital, the patient presented with a urethrocutaneous fistula at the ventral aspect of the penis. We repaired the fistula and had an uneventful postoperative course. A multidisciplinary approach was used in management of this patient; the psychiatrists, social workers and paediatricians.

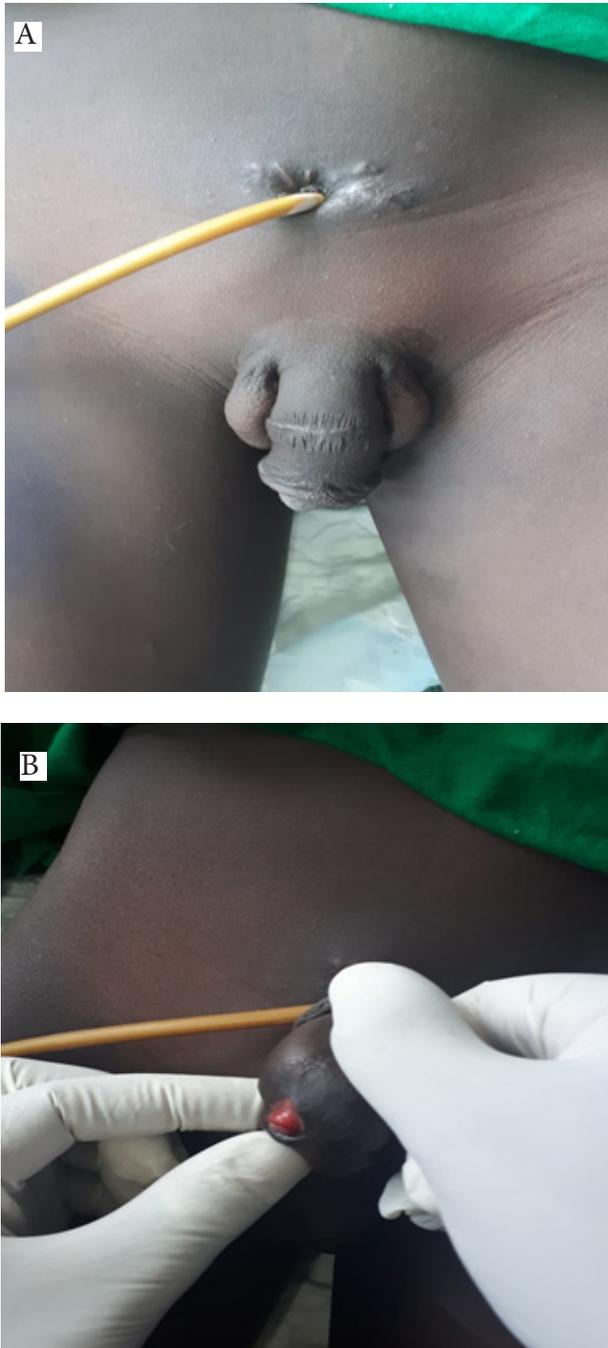


Figure 3 a, b: Urine diversion for a post traumatic self inflicted urethral injury in a patient with NE

DISCUSSION

Psychological issues have been known to be a trigger in development of nocturnal enuresis as well as to occur as a result of the condition. The children are

susceptible to emotional and physical abuse from their peers and are associated with low self-esteem and poor academic performance (2). It has been shown that there is a negative self-image and performance in children which worsens with treatment failure. The negative perceptions are more prevalent in females and the older age group (8). Sinha and Raut (9) explain that NE causes considerable distress or dysfunctional impairment to both the children and parents. This may present as lack of support from the parents or punishment which exacerbates the condition and or failure to seek treatment. Adolescents who undergo peer victimization have an elevated risk of later developing depression, suicidal behavior and self-harm thus it is important to recognize and treat psychological symptoms early.

Emotional distress associated with NE is reversible once the child is dry. Successful treatment of NE results in improved behavior and personality scores as well as improved mental health. Early institution of treatment prevents psychological effects of the disease and contributes to normal development of the child (10).

Careful evaluation of patients with NE should involve a multidisciplinary team and emphasis on the chronicity of the disease, need for follow up and support to both the patient and the parents. Psychological status of the patient may be evaluated by checklists before institution of treatment and as a follow up.

We have not come across other cases of physical self-harm due to NE to the extent of having urological emergencies. We highlight these two cases so as to emphasize on psychological assessment of these patients and timely referral to psychiatrists for evaluation.

ACKNOWLEDGEMENT

We thank the parents of the two patients who agreed to take part in this case study.

Patient consent

Consent to publish the cases was obtained. This report does not contain any personal information that could lead to the identification of the patient.

Declaration of conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this study.

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Reactive fibrous paratesticular pseudotumours mimicking testicular neoplasms: case series

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ABSTRACT

Paratesticular fibrous pseudotumours are rare slow growing lesions that arise from the testicular tunics and spermatic cord. They are the second most common type of benign paratesticular lesion. They can be singular or multiple fibrous nodules and are difficult to distinguishing from malignancy on the basis of clinical and preoperative investigations. Here we present two cases of benign testicular tumours that were treated with orchidectomy and testicular sparing surgery.

Keywords: Pratesticular tumours, Testicular tumours, Spermatic cord masses, Scrotal masses, Testicular masses

INTRODUCTION

Paratesticular fibrous pseudotumours are rare slow growing lesions that arise from the testicular tunics and spermatic cord. They are the second most common type of benign paratesticular lesion (1, 2). The aetiology is not well understood and they are thought to be reactive inflammation consequent to an initial insult like trauma or infection (2, 3). They can be singular or multiple fibrous nodules (4) and are difficult to distinguishing from malignancy on the basis of clinical and preoperative investigations (5). They were previously treated by orchidectomy but current practice is to perform testicular sparing surgery when feasible with aid of frozen section if needed (5, 6). Here we present two cases of benign testicular tumors that were treated with orchidectomy and testicular sparing surgery.

Case report 1

A 52 year old male presented with right painless scrotal swelling. Scrotal ultrasound showed 8 x 9 x 10 cm right testicular mass. No hydrocele or hernia noted. Left testis was normal. Tumour marker were done- β - hCG, α - feto protein (AFP), lactate dehydrogenase (LDH) were all within normal ranges. Right orchidectomy surgery performed.

Grossly a right orchidectomy specimen which include a right compressed testis (4 x 4 x 2 cm), epididymis (3 x 2 x 1cm), spermatic cord (9 cm in length) and a well circumscribed, intact, paratesticular tumour measuring 11 x 11 x 8 cm. The outer surface was smooth with few solid nodules 1.5 to 2 cm in diameter seen (Figure 1). Cut section of tumour showed white-tan firm, solid tumour with

whorled appearance. No haemorrhage or necrosis seen. Compressed testis, epididymis and spermatic cord were unremarkable (Figure 2). On microscopic examination the tumour was arising from thick tunica albuginea of testis arranged in storiform pattern of proliferating fibroblastic spindle cells against dense, hyalinised, collagenous stromal tissue. There is moderate lymphoplasmacytic infiltrate scattered throughout (Figure 3). Sections from surface nodules also show similar histology. No nuclear atypia, necrosis or increased mitosis seen. The compressed testicular parenchyma shows seminiferous tubules lined by Sertoli cells only. Leydig cell clusters and hyalinised sclerosed tubules seen. Spermatic cord and epididymis were unremarkable. No evidence of malignancy identified. The tumour cells were positive for vimentin, while they are negative for SMA, Desmin, CD34, S100p, B-Catenin, Alk-1, Calretenin and Pan-CK. Ki67 proliferating index was 1%.



Figure 1: Gross right radical orchidectomy specimen

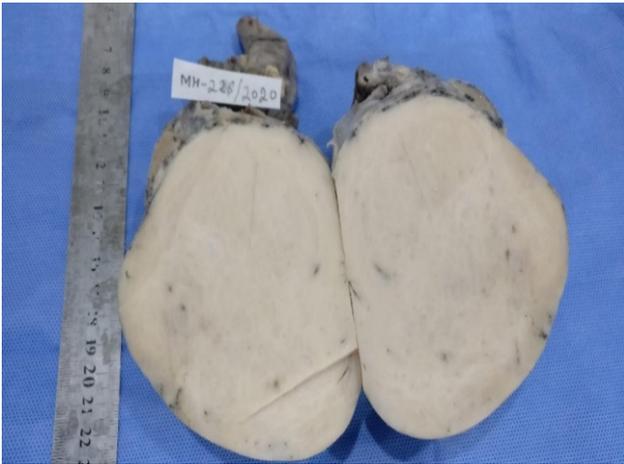


Figure 2: Cut section of tumour showed white-tan firm solid tumour with whorled appearance

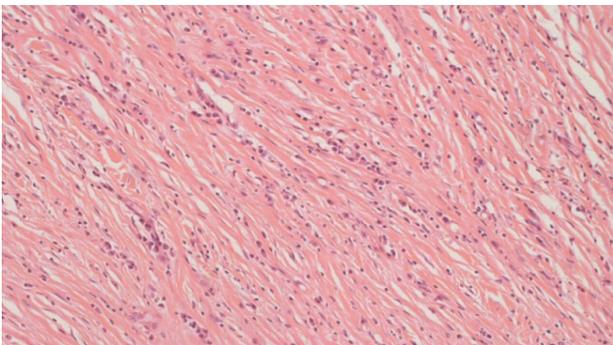


Figure 3: microscopically the tumour was arising from thick tunica albuginea of testis and arranged storiform pattern of proliferating fibroblastic spindle cells against dense, hyalinised, collagenous stromal tissue.

Case report 2

A 45 year old male presented with right large scrotal swelling separated by testis. It was painless mass, progressively enlarging over 3 months. On examination it was difficult to delineate from the right testicle. However, the ultrasound showed a large scrotal mass. Tumour markers of β - hCG, α -feto protein (AFP), lactate dehydrogenase (LDH) were all within normal levels. CT scan abdomen noted no features of local/distant spread of disease. Excision of right scrotal paratesticular mass was done, saving the testis and epididymis.

On gross examination a 12 x 8 x 8 cm right scrotal paratesticular mass received (Figure 4a, b). External surface was intact, capsulated, and nodular (Figure 5). Cut section showed greyish white, firm to gelatinous, solid appearance (Figure 6). On microscopic examination a circumscribed encapsulated mass comprising of proliferation of benign spindle cells and blood vessels seen. Spindle shaped fibroblastic cells were arranged in solid

fascicles and storiform pattern. Proliferating blood vessels were small to medium sized, had hyalinised walls and extravasated RBCs. Stroma was fibrous, collagenous and focally myxoid with scattered mild lymphocytic and mast cell infiltrate (Figure 7). No increased mitosis, nuclear atypia, necrosis or evidence of malignancy seen (Figure 7).



Figure 4a: Intraoperative imaging of testis and mass



Figure 4b: Intraoperative imaging of mass separated from testis

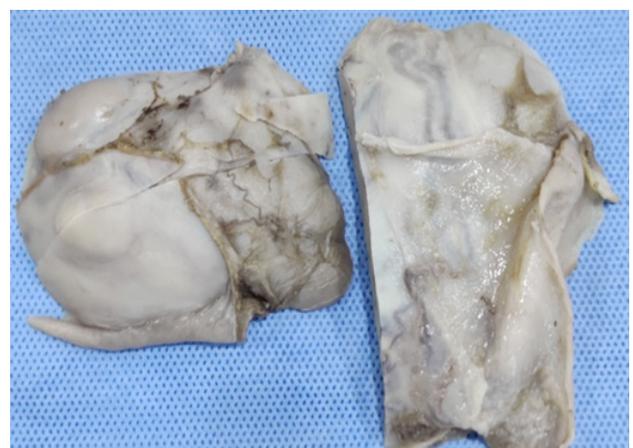


Figure 5: External surface was intact, capsulated, and nodular

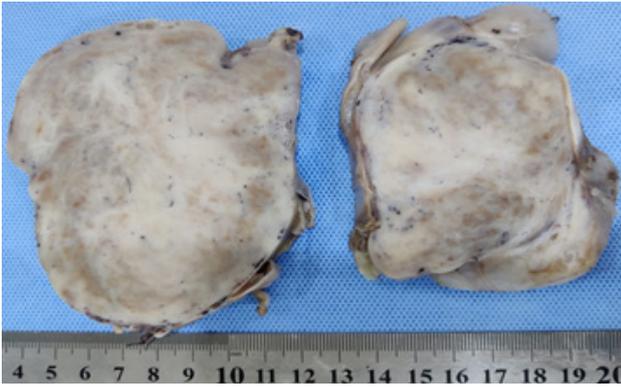


Figure 6: Cut section showed greyish white, firm to gelatinous, solid appearance

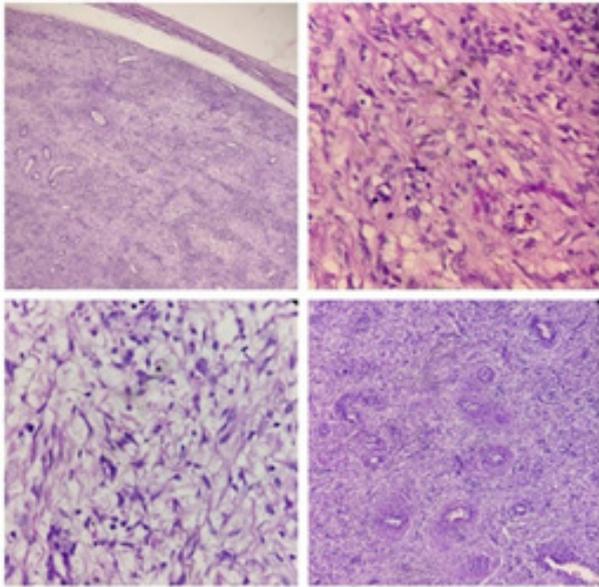


Figure 7: Microscopically proliferation of benign spindle cells Spindle arranged in solid fascicles and storiform pattern. Stroma was fibrous, collagenous and focally myxoid with scattered mild lymphocytic and mast cell infiltrate.

DISCUSSION

Paratesticular fibrous pseudotumours are a rare entity that were initially described by Balloch in 1904 (4) and later expanded by Hollowood and Fletcher (7). Since then, several terms have been used to describe it such as pseudosarcomatous myofibroblastic proliferation, proliferative funiculitis, inflammatory myofibroblastic tumour, inflammatory pseudotumour, nodular periorchitis, inflammatory paratesticular tumour of the spermatic cord, fibrous mesothelioma, reactive periorchitis, benign fibromatous tumor of testis and fibrous pseudotumour (4, 8-10).

They commonly occur in the second to fourth decade of life and are rare (5). The overall

incidence of these tumours is rare and have a relative incidence of 1:200 in relation to germ cell tumour (5). They are second most common benign paratesticular tumours after adenomatoid tumour (1). They are slow growing, painless lesions which can range in size from 0.5-8 cm (11). They can be solitary or multiple smooth circumscribed nodules and with some satellites within the cord. Majority of this tumours arise from tunica vaginalis (85%) followed by epididymis, spermatic cord and tunica albuginea (5).

The aetiology is still unknown, but is thought to be the result of reactive inflammation due to trauma, previous surgery or infection (2, 3). Some of the infections which have been reported include EBV, CMV, HIV Mycobacterium infections. It has also been associated with IgG-4 related immune conditions such as sclerosing cholangitis, retroperitoneal fibrosis Riedel's thyroiditis, or sclerosing sialadenitis (12, 13).

Preoperative investigations are needed to rule out malignancy. This includes tumour markers (AFP, B-hcg, LDH) to rule out testicular malignancy as testicular pseudotumours have no specific tumour markers. Ultrasonography is the initial imaging modality of choice to identify whether it is a cystic or solid lesion, single or multiple lesions and an intratesticular mass from extratesticular one, as intratesticular mass is usually highly concerning for malignancy. Pseudotumours can present as hyperechoic or hypoechoic lesions depending on degree of calcification, granulation tissue and hyalinized cartilage (5, 14).

Several authors have described the appearance of the pseudotumour on ultrasound but despite this the definite preoperative diagnosis is still challenging. Other additional imaging modalities (CT scan and MRI) are necessary if ultrasound is inconclusive. On MRI they appear as intermediate to low signal intensity on T1-weighted images and uniformly very low signal intensity on T2-weighted images (5, 15). The goal of the surgery is complete excision of the mass while sparing the testis whenever possible. Thus, testicular sparing surgery and utilization of frozen section assessment is optimal. Application of frozen section has helped reduce the number of unnecessary radical orchidectomy in benign diseases (6, 16). However, if the testis is significantly involved then radical orchiectomy is favored when a benign lesion is suspected. All cases yield a good outcome after complete surgical excision. Confirmation of complete surgical excision histologically is necessary to reduce risk of recurrence.

CONCLUSION

Bening paratesticular tumours are very rare and are difficult to confirm preoperatively. Combining testicular sparing surgery and frozen section can help prevent avoidable radical orchidectomy.

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Intravesical migrated ventriculoperitoneal shunt: Case report

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ABSTRACT

Cerebrospinal fluid (CSF) diversion procedures remain the principal method of treatment of hydrocephalus with ventriculoperitoneal shunt (VPS) catheter placement being the most common procedure for the treatment and urinary bladder is extremely rare. We report a case of 25 years old male post VPS with catheter migration to the urinary bladder who improved after laparotomy and shunt revision.

Keywords: Ventriculoperitoneal shunt, Recurrent UTI, Bladder perforation

INTRODUCTION

Cerebrospinal fluid (CSF) diversion procedures remain the principal method of treatment of hydrocephalus with ventriculoperitoneal shunt (VPS) catheter placement being the most common procedure for the treatment (1). The main obstacles of current techniques are complications such as shunt obstruction, infections and migration. Infection and obstruction are the most common complications, while migration of distal or proximal tube are very rare cases (2). Erosive bladder perforation by a peritoneal catheter is an extremely rare complication of VPS (3).

CASE REPORT

The patient was a 25 years old male who had hydrocephalus diagnosed 11 years ago and underwent VPS the same year. He was doing well post the diversion until 5 years later when he started to experience recurrent lower abdominal pains with the other features suggestive of lower urinary tract infections leading him to prolonged use of analgesics and antibiotics with no remarkable improvement.

On examination, he was anxious with mild hypogastric tenderness. Non-contrast computerized tomography scan of the head and abdominal pelvis revealed right parietal VPS with unilateral slit right ventricle, lower chest and anterior abdominal wall subcutaneous catheter, traversing peritoneum and penetrating the urinary bladder at the fundus with distal tip at the prostatic urethra suggestive of ventriculo-vesical shunt/migrated VPS. On ultrasound examination, the distal end of the VPS was seen in the urinary bladder.

At laparotomy, an active VPS was found perforating the urinary bladder with an adherent omentum to the bladder wall with no leakage. Assessment of the distal end proved an active shunt. The distal shunt was resected and a connection done then directed into the peritoneum. Bladder repair was done, CSF, VPS stump was taken for microscopy culture and sensitivity. The patient was left with a urethral catheter for 2 weeks and discharged home while improved. Culture results from the samples was unremarkable. The patient was reviewed after two weeks with marked improvement and no complaints.



Figure 1: VPS perforating into the urinary bladder



Figure 2: 12cm VPS that migrated that perforated and migrated into the urinary bladder

DISCUSSION

A common, easy, and reliable CSF diversion treatment of hydrocephalus remains VPS. Postoperative complications related to this procedure can be shunt obstruction, intracranial infections, shunt subcutaneous infections, abdominal infections, intestinal perforation and so on (2). Erosive bladder perforation by a peritoneal catheter is an extremely rare complication of VPS and can be associated with a peritoneum between the shunt catheter and the bladder, tough bladder wall making it very rare to damage during the surgery, constant peritoneal irritation leading to inflammation, fibrosis and perforation of the peritoneum and hence the gradual shunt migration into the urinary bladder in addition to hypothesized bigger bladder volume (3).

Being a rare complication, treatment of VPS shunt migration to the urinary bladder remains controversial (4,5). Proper management of distal VPS migration should include a course of prophylactic antibiotics and complete replacement of the shunt system with laparotomy if required (peritonitis or adhesion) (6). In our case, the patient had recurrent urinary tract symptoms and severe abdominal pains due to peritoneal and omental adherence. He was therefore initially kept on broad spectrum antibiotics and then taken for laparotomy.

CONCLUSION

Migration of VPS into the urinary bladder is a rare complication. Broad spectrum antibiotics, laparotomy with bladder repair and shunt revision remain treatment modalities in symptomatic patients with recurrent urinary tract infections.

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Abbreviations

Define abbreviations the first time they are mentioned and ensure consistency of abbreviations throughout the article.

Acknowledgements

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