BENIGN UROLOGICAL MANIFESTATIONS OF VESICAL SCHISTOSOMIASIS INFESTATION IN ABUJA: CASE SERIES

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CASE PRESENTATION

Urinary schistosomiasis is the most frequently encountered bilhaziasis infestation in Africa with wide range of clinical manifestation. We present three cases of urinary schistosomiasis with different manifestations. The aim is to emphasize the importance of high index of suspicion in the absence of the classical features of urinary schistosomiasis.

CASE ONE: He presented with left sided lower abdominal pain, recurrent hematuria and storage lower urinary tract symptoms. Urologic scan showed a hyperechoic mass measuring 10.2mm at the left ureterovesical junction and casting an acoustic shadow posteriorly. Intraoperative findings were that of a stenosed left distal ureter about 5mm from the ureteric orifice. We performed a left stented refluxing ureteroneocystostomy with excision of the stenosed ureter. Histologic section was suggestive of ureteric schistosomiasis.

CASE TWO: She presented with predominantly storage lower urinary tract symptoms and lower abdominal pain. Urologic scan showed thick walled urinary bladder with a central mass. Cystoscopy revealed a small capacity bladder with a polypoid mass arising from the dome of the bladder which was excised endoscoically and sent for histological analysis. The histology report was suggestive of schistosomiasis.

CASE THREE: She presented with storage lower urinary tract symptoms and painful terminal hematuria. Abdominal sonography and CT showed gross bilateral hydroureteronephrosis down to the vesicoureteric junction. Cystoscopy showed small capacity bladder (<60ml) with sandy patches at the trigone. She had augmentation cystoplasty and ureteric re-implantation.

CONCLUSION: A strategy for public enlightment, screening and early detection of schistosoma infestation of the urinary tract will provide a better assessment of this endemic parasitic infection with rising global public health concern.

KEYWORDS: Bladder, Cystoscopy, Histology, Schistosoma haematobium, Schistosomiasis, Terminal Hematuria.

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INTRODUCTION

Urinary schistosomiasis is the most frequently encountered bilhaziasis infestation in Africa with wide range of clinical manifestation peculiar to host immune response. This disease is endemic in Africa and the Middle East with the highest prevalence seen in Egypt.[1]

Schistosoma haematobium is a trematode worm implicated in this pathology and symptoms may be due to the granuloma formed typically in the lower urinary tract which heals by fibrosis with consequent calcifications, stone formation, strictures and eventual progression to bladder carcinoma.[2] The Urological manifestation of the disease can be classified into cellular and humoral immune response to infection with oncogenic potential.[3] The impact of the infestation differs with inflammation occurring early when granuloma are intracellular secreting inflammatory mediators and cytokines. Mesenchymal changes dominate the later stage with progressive fibrosis and/or calcifications and consequent malignant transformation.

Exiting prospects and progress made in the study of schistosoma infestation of the urinary tract has shown a wide and categorized pathobiologic syndrome. The manifestations are complex and manifold requiring a good knowledge of the underlying pathology.[4]

We present three cases of urinary schistosomiasis in Abuja with different manifestations. The focus is to emphasize the importance of high index of suspicion and knowledge of tropical medicine

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especially in the absence of the classical features of schistosoma hematobium infestation of the urinary tract.

CASE ONE

A 31 year old male who presented with left sided lower abdominal pain of three years duration and recurrent hematuria of one week duration. The pain was colicky, severe and he also had storage lower urinary tract symptoms. There was a history of childhood hematuria and wading in streams. Examination of the abdomen revealed mild tenderness over the left lumbar region. Urologic scan showed a hyperechoic mass measuring 10.2mm at the left ureterovesical junction and casting an acoustic shadow posteriorly. Intravenous urogram revealed bilateral hydroureter with the left calyces and ureter dilated down to the ureterovesical junction (figure 1 and 2). Serum electrolytes, urea and creatinine were within normal limits. Based on the above evaluation the patient was diagnosed as probably having a left impacted distal ureteric calculus.

Figure 1: Intravenous urogram showing left hydroureter with the left calyces and ureter dilated down to the ureterovesical junction.

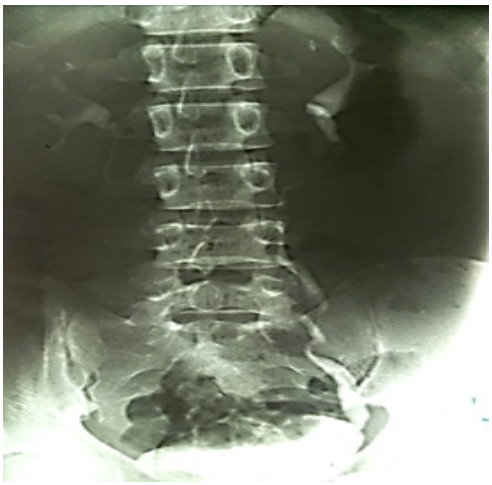
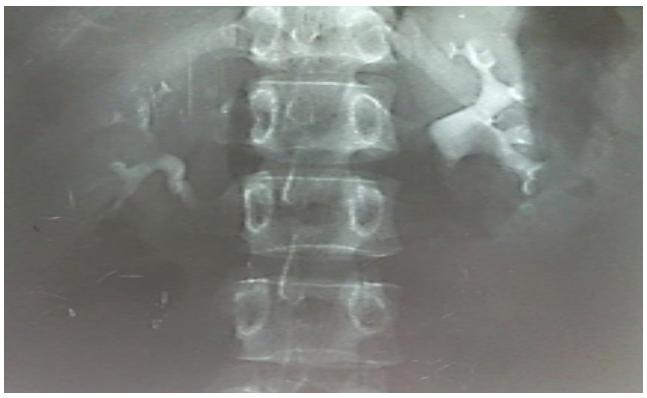
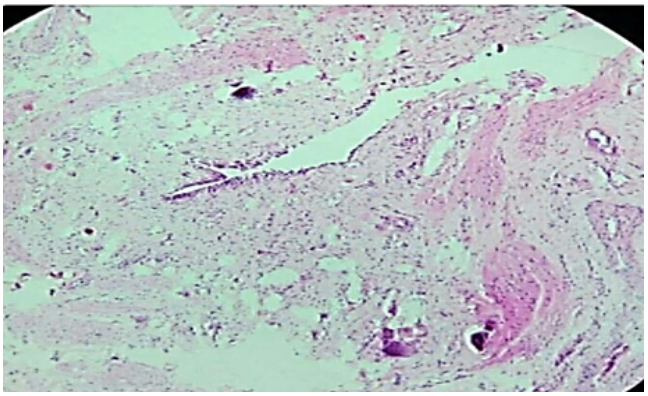


Figure 2: Excretory phase of intravenous urogram showing dilatation of the pelvicalyceal system which is marked on the left side.



He was placed on analgesics, antispasmotic and empirical antibiotics. We prepared him for a possible ureterolithotomy and ureteronoecystostomy but the main intraoperative finding was a stenosed left distal ureter about 5mm from the ureteric orifice. The ureter proximal to the stenosed part was dilated measuring 15mm in widest diameter. No bladder or distal ureteric calculi was seen. We performed a left stented refluxing ureteroneocystostomy with excision of the stenosed ureter. He was discharged after 7 days to continue follow up in urology clinic. Histologic section showed numerous calcified oval bodies within the muscular wall with terminal spine consistent with schistosoma suggestive of ureteric schistosomiasis as shown in figure 3. He was subsequently placed on praziquantel and the symptoms subsided.

Figure 3: Photomicrograph showing ureter lined by attenuated urothelium surrounded by connective tissue containing calcified ova of schistosoma and few giant cells.



Case two

A 12 year old girl who resides in north central Nigeria presented with predominantly storage lower urinary tract symptoms and insidious onset severe lower abdominal pain of 3 years duration. She was using diapers due to associated severe urgency and urge incontinence. There was history of wading in streams with an episode of terminal painless hematuria. She had no exposure to chemicals, drenching night sweat, perineal trauma or passage of stones in urine. There was no renal angle tenderness but suprapubic tenderness was elicited on abdominal examination.

Urologic scan report showed thick walled urinary bladder with a central mass. Both kidneys showed poor corticomedullary differentiation with dilated pelvicalyceal system. Intravenous urogram and CT urography were normal. Urine microscopy

yielded growth of Escherichia coli. No ova of schistosomiasis were seen. Her Hemoglobin genotype was AA, serum electrolytes; urea and creatinine were within normal limits. She was treated for urnary tract infection based on antimicrobial sensitivity. Cystoscopy revealed a small capacity bladder with a polypoid mass arising from the dome of the bladder. This bladder mass was excised endoscopically using a snare loop. She was discharged the next day on praziquantel to be reviewed in clinic. The histology report showed benign chronic granulomatous inflammatory lesion infiltrating the submucosa and the muscularis layer of the bladder. The inflammatory cells composed of lymphocyte, histiocytes and plasma cells with focal areas of calcified schistosomal ova with no evidence of malignancy.

Case three

A 61 year old female who resides within schistosomiasis belt of north central Nigeria and engaged in farming for most of her life. She presented to the urology clinic with storage lower urinary tract symptoms of 20 years duration. She complained of painful terminal hematuria in the last three months. She became bothered by the progressively worsening storage lower urinary tract symptoms. There is progressive leg swelling, easy fatigability and postprandial vomiting. She gave a history of childhood hematuria and waddling in streams. She was diagnosed of diabetes mellitus and hypertension 10 and 15 years respectively. She does not smoke cigarette or take alcohol. She has never worked in a dye industry.

Examination revealed a lethargic woman, afebrile, pale with pedal edema. Her blood pressure was 150/90mmhg and the pulse rate was 96bpm. There is mild suprapubic tenderness but no mass was felt per abdomen. Vaginal and rectal examination did not reveal any abnormality.

Urinalysis revealed blood (3+), leucocyte and pus cells. Escherichia coli were cultured from the sample. Her hemoglobin was 8.6g/dl. Serum urea was and creatinine 4.7mg/dl. Liver function test and fasting blood sugar were normal. Abdominal sonography and CT showed gross bilateral hydronephrosis and dilated pelvicalyceal system well as hydroureters down to the vesicoureteric junction. The ureters were tortuous and kinked at the mid-portion on the right. The urinary bladder wall was markedly thickened but no definite mass was seen.

She was treated with parenteral antibiotics based on the sensitivity pattern and transfused 2 units of blood. Cystoscopy was performed and a small capacity bladder (<60ml) was noted. The trigone had sandy patches and the ureteric orifice could not be visualized. She had augmentation cystoplasty using the monti technique and re-implantation of the ureters over a stent (see figure 4 and 5). Her post-operative recovery was initially characterized by vomiting and fever but by the 5th day she improved significantly. The renal function also improved gradually and serum creatinine dropped to 2,4mg/dl and urea of 10mmol/l on the 9th post-operative day. She was discharged home 14 days after surgery when the catheter and skin staples were removed. Two months after surgery, she observed improvement in the ability to hold urine and was happier with her urinary function. Her serum creatinine further dropped to 1.9mg/dl and urea 8mmol/l.

Figure 4: Isolated segment of ileum being detubularized for augmentation cystoplasty.

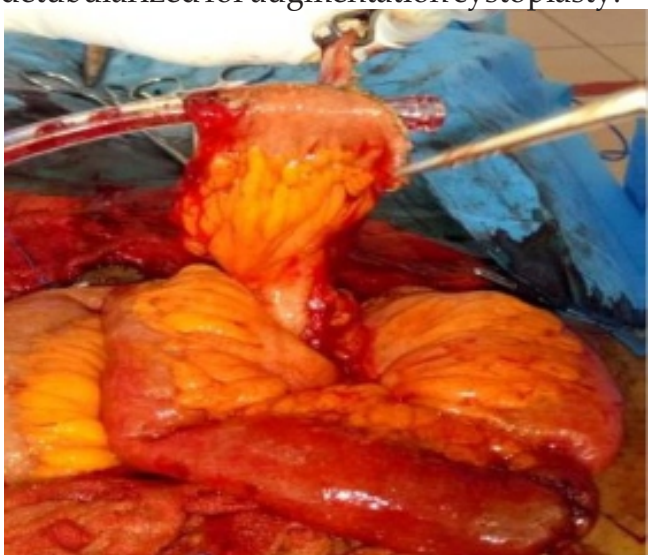
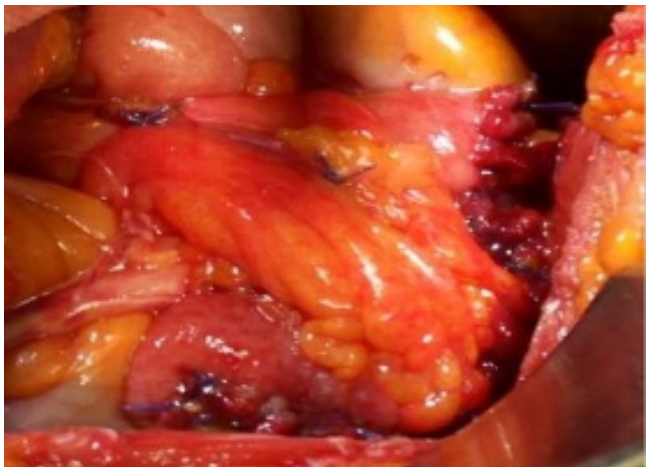


Figure 5: Augmentation cystoplasty for contracted bladder due to schistosomiasis.



DISCUSSION

Urinary schistosomiasis is caused by schistosoma haematobium and remains a common cause of long term morbidity in Africa, South America, the Caribbean, Asia and the Middle East.[1,8] Swimming is a potent medium for the spread of the parasite which has an extraordinary capacity to evade the immune system.[9] The bladder, lower ureters, urethra, seminal vesicles, uterus, cervix, and vagina are the sites usually affected.[2,6] Clinical features range from painful terminal hematuria in the early stages to features of urinary tract obstruction, fibrosis, metaplstic changes and symptoms of secondary bacterial infection in the long term.[6] Our patients presented with complicated cases of long standing vesical schistosoiasis viz lower ureteric obstruction, bladder mass and a contracted bladder respectively with diagnostics dilemma.

The wide clinic-pathological spectrum of urinary schistosomiasis depends on the host's immune response, worm load and egg burden, duration of infestation, microbial co-infections and other co-morbid conditions[1]. This can explain why our patients presented with peculiar symptoms.

Schistosoma *hematobium* infestation typically involves the bladder and lower ureters which was the case in our patients. Human infection requires direct contact with freshwater snail. The larvae from this snail penetrate the human skin and migrate to the vesical and pelvic plexus where they mature and lay eggs which penetrate the bladder and become encapsulated. The first lesion is mucosal granuloma which coalesces to form tubercles and nodules. This may progress to involve other areas with hyperemia, mucosal breakdown and ulceration with terminal hematuria. The involvement of detrusor muscle may lead to loss of accommodation function of the urinary bladder which results to a small capacity urinary bladder. This pathology would explain the third case who had a small capacity urinary bladder manifesting with severe storage lower urinary tract symptoms. Benign bladder masses could result from the coalition of pseudotubercles giving rise to a polypoid mass as seen on cystoscopy in one of our patients .

The ureterovesical junction and the ureters may be involved and this has been reported in 65% of cases.[6] In Eygpt, the prevalence of schistosomal obstructive uropathy due to stenosis, fibrosis and induration was 62.5% with such lesion having higher egg burden.[7] Similarly one of our patients had upper urinary tract obstruction which was thought to be due to an impacted stone around the ureterovesical junction with ultrasound showing a hyperechoic mass measuring 10.2mm at the left ureterovesical junction and casting posterior acoustic shadow. This wrong diagnosis could have been due to the pathological effect of fibrosis and calcification which characterizes vesical schistosomiasis and can mimick a stone on radiograph.[7]

Urologic scan was useful in the evaluation of this pathology in all three patients in our facility as it detected dilatation of the pelvicalyceal system due to stenosed right lower ureter, thick wall bladder with a bladder mass and small capacity bladder respectively. However the sensitivity of ultrasound in detecting calcifications was poor in our cases in keeping with findings of other researchers.[6] Characteristic isolation of ova in the urine is most beneficial at the early stage of infestation.[1] No ova of schistosoma hematobium was found in the urine of our patients. This was not a surprising finding since our series focuses on late manisfestions of vesical schistosomiasis.

Cystoscopic findings of sandy patches which signify a healed lesion are pale mucosa patches in the vesical endothelium. This may progress to cystitis cystica which are normal mucosa encysted by surrounding fibrosis. The third patient had sandy patches with small capacity urinary bladder. The underlying cystitis and fibrosis can account for the small capacity urinary bladder seen in our patient. Involvement of the submucosa and detrusor muscle may also lead to bladder contraction. Bladder augmentation is an excellent procedure done in patients with marked reduction in bladder capacity to improve urinary storage and overall renal function. It provides safe and functional reservoir that improves bladder compliance and prevents upper tract deterioration.[10] The renal function of our patient normalized after augmentation cystoplasty was performed.

The bladder neck and by extension the posterior urethra can be affected by intense fibrosis because of its proximity to the bladder trigone which is the typical site of schistomiasis infestation in the

urinary tract. Bladder neck involvement can lead to outlet obstruction with consequent compensatory changes in the bladder wall and upper urinary tract. Extension beyond the bladder neck may result in stricture formation.[2] None of our patients had bladder outlet obstruction and no compensatory changes due to outlet obstruction were seen at cystoscopy.

The ureterovesical junction is not spared either and this is attributable to its proximity to the bladder trigone. Progressively the ureterovesical junction may become congested, edematous and stenosed.[2] Patients can also develop reflux with back pressure effect on the upper urinary tract and renal impairment.. This infestation affects the lower third of the ureter due to the communication between the inferior mesenteric and the periureteric and perivesical veins.[2] The lesions in the ureter are similar to those seen in the bladder whereby there are sequential changes from inflammatory to calcification, nodules and tubercles. Stenosis and stricture formation are due to mural fibrosis. Many cases of ureteric involvement also have bladder pathology.[11]

The incidence of bladder malignancy from urinary schistosomiasis is reported as 4.5% in Nigeria.[12] Squamous cell carcinoma is typically the histological type in about 60% of cases.[1] In a critical evaluation of 1026 cases in Egypt who had cystectomy, squamous cell carcinoma accounted for 59% of cases, transitional cell carcinoma 22% and adenocarcinoma 11%.[13] Cystoscopy and biopsy remains the gold standard is determining the histological type as the clinical presentation of cystitis, necroturia and lower urinary tract symptoms which are early signs are not peculiar to any type. Histology did not reveal any malignancy in our patients.

Medical therapy using praziquantal is effective following surgical intervention such as ureteric re-implantation, bladder mass extirpation and augmentation cystoplasty.[14] These surgical maneuvers were done for our patients with impressive outcome.

CONCLUSION

The burden of this disease correlates with the worm load and the immune system of the individual. Diagnosis of surgical manifestations of urinary schistosomiasis should be based on clinical features, high index of suspicion with relevant laboratory and histologic examination of biopsy specimen. In endemic climes such as ours, it is imperative to have this as a differential diagnosis in problems of the urinary tract. A strategy for public enlightenment, screening and early detection of schistosoma infestation of the urinary tract will provide a better assessment of this endemic parasitic infection with rising global public health concern. Increasing awareness of the unusual manifestation of this disease and treatment options especially in patients who resides in endemic areas will curtail the structural damage caused by this infestation.

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