African Journal of Urology (2016) **22**, 227–229

African Journal of Urology

Official journal of the Pan African Urological Surgeon's Association
web page of the journal

www.ees.elsevier.com/afju
www.sciencedirect.com

Stones and Endourology
Short Communication

A rare case of preputial calculi in a child with balanitis xerotica obliterans: A short communication

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Received 4 January 2015; received in revised form 4 May 2015; accepted 7 May 2015
Available online 26 July 2016

KEYWORDS
Preputial stone;
Balanitis xerotica obliterans (BXO);
Meningomyelocele

Abstract
Preputial stones are the rarest form of urolithiasis in pediatric patients with only a few cases reported in the literature. Following, we present the case of an 11-year-old boy who developed preputial stones.

Introduction

Preputial calculi is a rare disease, while urinary retention due to phimosis is common. We report the case of an 11-year-old boy suffering from urinary incontinence secondary to a meningomyelocele (operated in the neonatal period) and urinary stasis in the sub-preputial space due to balanitis xerotica obliterans, leading to stone formation.

Case report

An 11-year-old boy was brought to our hospital by his parents with complaints of continuous urine leakage. As a neonate, the patient had been operated for dorso-lumbar meningomyelocele with placement of a ventriculo-peritoneal shunt. He has had no lower limb muscle power and has been bladder/bowel incontinent since his birth. The patient had not been followed-up at any health center after the initial operative procedures. On examination, the child was conscious, oriented to time, place and person and was of normal intelligence. He had an irregular pulse, low-grade fever, loss of muscle power in both lower limbs and bladder and bowel incontinence.

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Peer review under responsibility of Pan African Urological Surgeons' Association.

http://dx.doi.org/10.1016/j.afju.2015.05.002

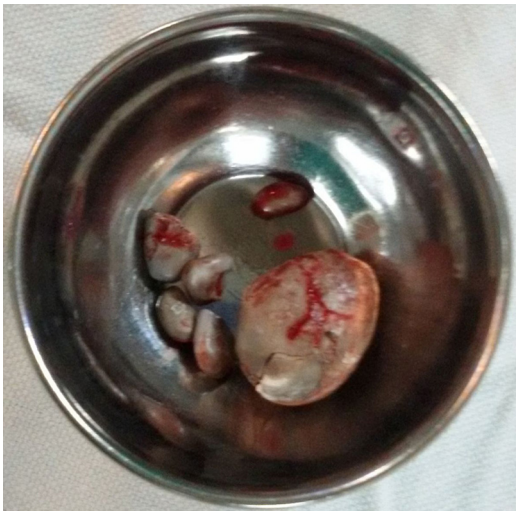

Figure 1 A clinical photograph showing the phimotic scarred prepuce with the calculi underneath.

Examination of the genitalia revealed phimosis and a thick and fibrotic preputial skin with palpable hard nodular structures underneath (Fig. 1). Continuous urine leakage had led to maceration and infection of the skin. There was also a decubitus ulcer above the right gluteal region.

Blood analysis showed a raised WBC count and normal blood gas levels. Urinalysis revealed 2–3 pus cells/hpf. Preoperative urine cultures were positive for *Escherichia coli*, *Enterococcus* sp. and *Citrobacter* sp. Pelvic X-ray showed radio-opaque lesions in the penile region, consistent with the palpable hard nodular structures suggestive of a stone. Other investigations such as a shunt series were normal.

After controlling the local skin infection with antibiotics and topical antifungals, the patient was scheduled for circumcision. At surgery, multiple stones were extracted from underneath the preputial skin (Figs. 2 and 3). The stones were sent for biochemical analysis.

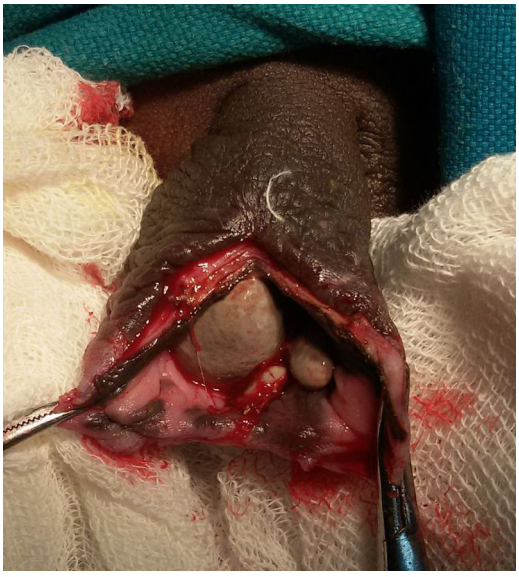

Figure 2 Intra operative picture showing the sub-preputial calculi.

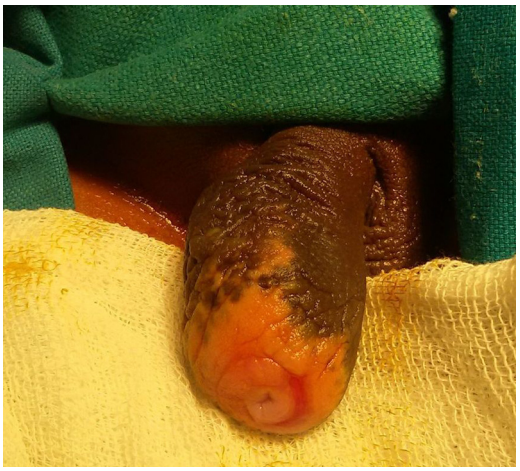

Figure 3 View of the extracted stones.

The circumcised skin was sent for histopathological examination.

Stone analysis revealed that the stones were composed of uric acid, urates, phosphates, xanthine, calcium, magnesium, oxalate and ammonia. There were no signs of sulphate and carbonates. The total weight of the stones was 9.96 g.

The decubitus ulcer was managed with regular wound care treatment.

The parents were instructed on how to perform clean intermittent catheterization and were advised to apply rectal enema once daily. The patient is on regular follow-up.

Discussion

Preputial stone disease is a very rare form of urolithiasis, and very few cases of this pathology have been reported in the literature. Such calculi have mainly been reported in elderly, uncircumcised males [1]. There have also been reports of adults with metabolic disorders who developed preputial calculi [2]. Preputial stone disease is primarily regarded as a result of severe phimosis; other causes are smegma solidification and accumulation of urine flow in the preputial area. Preputial stone disease may be associated with complications such as stranguria, dysuria, hematuria and preputial ballooning during voiding, rarely with urinary retention. Tugen et al. also reported development of a preputial skin fistula as a complication of preputial calculi in a 12-year-old boy suffering from neurogenic bladder and paraparesis secondary to a repaired meningomyelocele [3].

It is commonly understood that phimosis should be treated, and the knowledge of the importance of personal hygiene is now widespread. Therefore, preputial calculi are rare nowadays.

These calculi can be classified into three groups according to their pathogenesis [4]: The first group includes calculi that originate from inspissated smegma with lime salts. The second type, composed of either magnesium ammonium phosphate or calcium phosphate, is formed in stagnant urine retained in the preputial sac. The third type derives from the upper urinary tract and migrates into the

preputial sac. In our case, the calculi were composed of magnesium ammonium phosphate (struvite) and magnesium acid urate, thus indicating the second type of calculi. Since the sub-preputial space had acted as a urinary reservoir and bacterial infection had developed, the calculi had formed over a long period. Although it is known that struvite stones are characteristically related to infection due to urease-producing bacteria [5], such typical organisms were not detected in our patient.

It appears that in addition to the presence of a tight phimosis, children may have additional predisposing factors such as neurological impairment [6] and, according to one report, even epispadias [7].

Conflicts of interest

None.

Funding

None.

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