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Case Report

Hanging Bladder calculi Secondary to Misplaced Surgical Suture

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Bladder calculi, a rare condition in the pediatric population, occur most commonly as a result of either migration from the kidney or urinary stasis in the bladder. We report the case of a 3-year-old boy with recurrent urinary tract infections (UTI) secondary to bladder calculi formation on the sutures from a previous herniorrhaphy. A 3-year-old boy with previous history of herniorrhaphy presented with recurrent episodes of urinary tract infection, resistant to antibiotic therapy. Physical examination was unremarkable. Ultrasoundography (US) showed an echogenic fixed intra-luminal lesion in the bladder. Cystoscopic evaluation was performed and confirmed presence of calculus forming around several permanent silk sutures fixed to the bladder wall. The patient undergone cystotomy and the calculi were resected. The stone analysis revealed 80% uric acid calculi. The final diagnosis was of bladder calculi due to remnant suture from past herniorrhaphy.

Keywords: Urinary Bladder Calculi; Urinary Tract Infections; Sutures; Herniorrhaphy

1. Introduction

Bladder calculi, a rare condition in the pediatric population, occur most commonly as a result of either migration from the kidney or urinary stasis in the bladder. Previous pelvic or inguinal surgery with non-resorbable sutures, especially in the proximity of the bladder, may complicate with lithiasis, a starting point for recurrent UTI. Here, we report a 3-year-old boy with previous history of herniorrhaphy presented with recurrent episodes of urinary tract infection, resistant to antibiotic therapy. Physical examination was unremarkable. Ultrasonography (US) showed an echogenic fixed intra-luminal lesion in the bladder. Cystoscopic evaluation was performed and confirmed presence of calculi forming around several permanent silk sutures fixed to the bladder wall.

2. Case Presentation

A 3-year-old boy was referred to our hospital for evaluation of recurrent urinary tract infection (UTI) since about two and half years prior to admission. The patient had undergone herniorrhaphy procedure when he was 5 months old and he experienced the first episode of UTI just 1 month after the surgery. After that, he developed four additional episodes of UTI, requiring hospitalization and antibiotic therapy. Three months before admission in our center, he suffered from persistent UTI with Pseudomonas aeruginosa (P. aeruginosa), resistant to antibiotic therapy. Upon admission, the patient was a well-developed 3-year-old boy, with normal developmental milestones, without urinary symptoms. He had several periods of fever and chills, without voiding dysuria.

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Figure 1. A 3-year-old boy with recurrent UTI and history of herniorrhaphy. A,B, Ultrasound exam revealed echogenic foci within bladder suspicious of calculi

Figure 2. Urinary calculi formed around surgical sutures remnant within bladder wall

3. Discussion

Bladder stone is rare in the pediatric population. Bladder calculi occur most commonly as a result of either migration from the kidney or urinary stasis in the bladder. Urinary stasis is usually related to bladder outlet obstruction, cystocele, neurogenic bladder, or a foreign body in the bladder (1). Urinary tract stones and urinary tract infection are strongly associated. Infection is implicated as the cause of stones in about 15% of stone formers, and the development of infection can complicate the management of preexistent calculi. Left untreated, both situations can result in loss of kidney function, and may become, although rarely, life threatening conditions (2). On US, a mobile, echogenic focus with distal acoustic shadowing will be seen in the bladder. If the stone is large, edema of the ureteral orifices and thickening of the bladder wall may be seen. Occasionally, stones can adhere to the bladder wall because of adjacent inflammation, and these are known as "hanging" bladder stones (1). Foreign bodies, such as surgical sutures, may act as a leading point for developing bladder calculi. These stones are typically non-mobile and present as hanging fixed echogenicity on US. On the other hand, herniorrhaphy is one of the most commonly performed operations worldwide. Iatrogenic bladder injury is a rare complication of this surgery. Incorrect deep suturing or surgical mesh used in inguinal herniorrhaphy may involve the bladder wall and lumen, and intraluminal portion can act as a nidus for stone formation (3, 4). Based on literature reviews, other surgical operations, such as extrophy repair (5), stress urinary incontinence surgery (6), prostatectomy (7), caesarian section (8) etc., may also cause bladder stone formation due to application of non-absorbable sutures, like silk sutures. Even though, most of these complications occur in adult population,
the review of our patient’s medical history revealed the etiology. As far as we know, it is the first pediatric case of iatrogenic bladder calculi forming around the surgical sutures remnants. Here, we reported a 3-year-old boy who suffered from recurrent UTI with unknown origin, beginning just after herniorrhaphy surgery. The underlying etiology was underdiagnosed for about two and half years. Finally, in our department, aberrantly positioned surgical sutures remnant into the bladder wall were discovered after cystostomy, as a nidus for stone formation and the cause of recurrent UTI. The differential diagnosis for multiple linear fixed echogenicities in the bladder, with posterior acoustic shadow, includes multiple bladder calculi, calcified bladder tumor, foreign bodies, bladder wall inflammation and infection. From a radiological point of view, most bladder stones are frequently mobile and seen in dependent portion of the bladder. For non-mobile fixed stones, such as the presented case, we must always be aware of other etiologies, especially in patients with posterior acoustic shadow, includes multiple bladder calculi, calcified bladder tumor, foreign bodies, bladder wall inflammation and infection. Initially, we considered that the multiple echogenicities such as foreign bodies or inflammatory processes (1). However, to avoid serious complications, surgeons must be careful and to use absorbable sutures in deep structures and also to take more attention to avoid bladder injury during nearby operations.

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References