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Delayed Extravesical Shrapnel Migration into the Urinary Bladder: A Case Report and Review of a Rare Clinical Entity

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ABSTRACT

Foreign objects in the urinary bladder may result from urethral passage by the patient, extraneous trauma or ballistic injury, or even more rarely as a result of spontaneous migration of retained metal fragments from prior trauma. In the former acute trauma settings, the patient usually presents for prompt evaluation and treatment. In the latter setting, the patient may present in a delayed fashion with nonspecific urologic complaints. We present an unusual case report involving the extremely delayed migration of a retained piece of shrapnel into the urinary bladder.

KEYWORDS

Bladder, Extravesical, Trauma, Shrapnel

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INTRODUCTION

Urologists are well accustomed to the removal of foreign objects from the urinary bladder. A smorgasbord of foreign objects have previously been found in the bladder, not uncommonly defying the imagination. Most commonly, foreign objects are passed per urethra by the patient for sexual or erotic pleasure [1]. Rarely, foreign objects may enter the bladder as a result of extraneous trauma or ballistic injury. Even more rarely, this happens as a result of spontaneous migration of retained metal fragments from prior trauma [2]. In the former cases, the patient usually presents in the acute trauma setting for prompt surgical evaluation and treatment. In the case of migratory metal fragments, on the other hand, the patient may present in a delayed fashion with nonspecific urologic complaints. We present an unusual case report involving the extremely delayed migration of a retained piece of shrapnel into the urinary bladder of a combat veteran.

CASE PRESENTATION

A previously healthy, 60-year-old retired combat veteran was referred to our medical center for the evaluation and treatment of recurrent urethral strictures. The patient's urologic complaints included intermittent sporadic painless gross hematuria and a history of recurrent urinary tract infections for the past several months. Surprisingly, the patient reported only minimal lower urinary tract symptoms, which were otherwise not bothersome. Prior urologic evaluation at the referring institution included a grossly positive urinalysis with a concomitant E. coli urinary tract infection treated with oral fluoroquinolone antibiotic therapy, negative urinary cytology, and a penile urethral stricture on cystoscopic evaluation. The patient's past medical history was significant because of a prior exploratory laparotomy in 1968 for removal of shrapnel resulting from a battlefield blast injury. In addition, he also had a long history of recurrent urethral stricture disease having required multiple dilations. This was thought to be secondary to the associated synchronous pelvic injuries. Given the presenting history, the patient was

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case observation

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Figure 1. 4-cm hyperopaque bladder calculus
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evaluated at our institution with a voiding cystourethrogram (VCUG) for further examination of the urethral stricture. The scout plain film radiograph revealed a large, 4-cm hyperopaque bladder calculus (Fig. 1), and the VCUG demonstrated a 0.5-cm midurethral stricture (Fig. 2). The upper tracts were cleared with a CT urogram. The patient was scheduled for a direct vision internal urethrotomy (DVIU) for the management of urethral stricture and concomitant cystolithotripsy for the bladder calculus. After uneventful DVIU with the cold knife, the bladder was entered and the presumed 4-cm bladder calculus identified (Fig. 3). There was a marked inflammatory response involving the bladder floor with intense hyperemia and bullous edema in close proximity with the calculus. The remainder of the cystoscopy was unremarkable; specifically, there was no evidence of bladder fistula or perforation upon a thorough and meticulous bladder survey. After an initial attempt with Holmium laser lithotripsy using a 1000ų fiber, the procedure was immediately terminated after it was determined that the stone in question was a piece of encrusted metal shrapnel. A large bore urethral catheter was placed uneventfully, and the patient was subsequently admitted to the urology service and underwent open cystotomy and removal of metal shrapnel. He did well post-operatively without any sequelae and has no residual lower urinary tract symptoms at one-year follow-up.

DISCUSSION

In the majority of cases involving bladder foreign bodies, the history usually elicits transurethral passage of the offending agent for sexual or erotic stimulation in the presence or absence of an intoxicated or confused state. Resulting symptoms usually involve urinary frequency, dysuria, nocturia, hematuria, gross bleeding from the urethra, difficulty in voiding, or complete urinary retention. A review of the literature reveals an exhaustive list of items which have been passed through the urethra and into the bladder including telephone wires, ballpoint pens, medicinal ampules, fish tank irrigation tubing, rolled paper money, toothbrushes, and perfume bottles [3]. In some cases, a psychiatric evaluation will reveal mental illness. Less frequently, bladder foreign bodies result from external trauma or ballistic injuries. Gunshot injuries to the urinary bladder are uncommon and, in most cases, penetrate the bladder at the time of injury. Such cases usually present in the acute setting and not uncommonly in association with multi-organ injuries. Hematuria and severe voiding symptoms prelude either eventual spontaneous passage or the need for surgical intervention, depending on the size of the bullet. A survey of the contemporary peer reviewed literature revealed only two other case reports involving the delayed migration of an extravesically lodged bullet into the bladder resulting from bladder wall compression and transmural erosion. The underlying mechanism, which putatively involves tissue compression, ischemia, and eventual focal tissue destruction, closely emulates that of decubitus ulcer formation [2]. Perhaps even more rarely, bullets lodged in the renal parenchyma

Figure 2. 0.5-cm penile urethral stricture
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may migrate into the collecting system and eventually work their way downstream into the bladder [4]. In these previous case reports, the usual time to presentation from the initial injury to the removal of the bladder foreign body ranged from 11 months to 9 years. In our case, the extremely protracted presentation of the patient nearly 40 years after the initial shrapnel injury is quite unique, not only since the large piece of shrapnel was missed at the time of exploration, but also because the patient had only minor, nonspecific urologic symptoms leading up to his incidental diagnosis. In addition, the previous reports involved small, 9-mm bullets, whereas the present case involved a very large, 4-cm piece of irregularly shaped shrapnel metal. Indeed, it is quite surprising and difficult to explain how a piece of metal shrapnel this large was able to gradually erode through the bladder wall without causing more severe symptoms. Two alternative, but much less likely explanations, may also be entertained: first, the metal fragment in question traversed the bladder wall at the time of initial injury and remained intravesically without causing any symptoms until four decades later, and second, the metal fragment may have resulted from a dislodged surgical prosthetic. However, the patient's past medical history did not include any prosthetic surgeries, and furthermore, the very irregular and jagged shape of the metal fragment makes this scenario very unlikely. This case report of an unusually delayed presentation of extravesical shrapnel erosion into the urinary bladder reintroduces a rare but clinically significant late complication that may arise from retained metal fragments.

Figure 3. Metal shrapnel (black arrow) with surrounding intense hyperemia and bullous inflammatory changes (white arrow)
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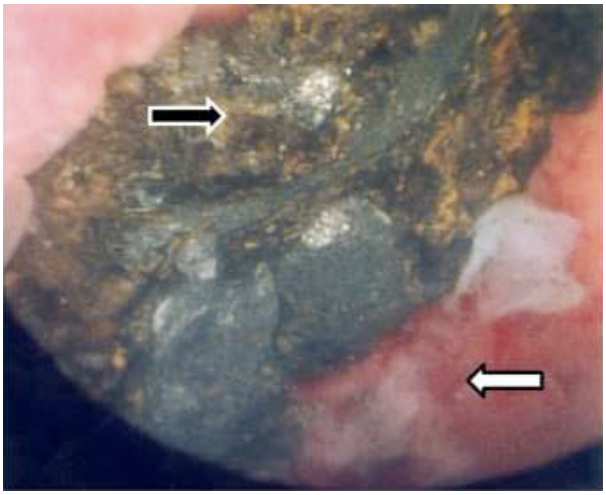

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