

Trauma and reconstruction

Migrated bullet in the bladder presenting 18 years after a gunshot wound

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ABSTRACT

Gunshot wounds to the genitourinary system are relatively rare, and it is even rarer a retained bullet migrates into the urinary tract. We describe a case where the bullet migrated into the bladder and formed a bladder stone eighteen years after the injury. This presentation is unique as it is one of the longest times from gunshot wound to presentation in the current literature.

Introduction

Gunshot wounds (GSW) to the genitourinary (GU) system are relatively rare and account for nearly 10% of the 2.8 million trauma patients admitted to U.S. hospitals.¹ In addition to GSWs causing direct injury, there have been several case reports of bullets migrating into the GU system with delayed presentation of urinary symptoms. We report a case of a bullet migrating into the bladder eighteen years after a GSW and causing lower urinary tract symptoms due to the formation of a bladder stone around the bullet fragment.

Case presentation

A 42-year-old male presented to the urology office with difficulty voiding for about one year and one episode of hematuria within the last month. While urinating, the patient described a pain-like sensation in his right flank that then cut off his urinary stream, like a ball-valve effect. He denied complaints of increased urinary frequency, urgency, or hesitancy. He felt that he fully emptied his bladder. He denied a history of any kidney stones or urinary tract infections. He was sexually active and reported similar pain-like symptoms during ejaculation. The patient had a smoking history of two packs per day but had cut down to one pack per day for the last 27 years. The patient had a history of alcoholism and quit drinking seven months before presentation. Review of systems was positive for one episode of gross hematuria.

The patient's medical history was significant for a GSW that pierced through the bladder eighteen years ago. The bullet was not removed at that time as it was inaccessible, but the patient required prolonged catheterization.

Cystoscopy was performed in the office, which revealed a bladder stone that was too large to pass through the urethra. The patient was later taken to the OR for a cystolitholapaxy. A 1000 μm laser fiber was used for fragmentation of the stone. The outer layer of stone material was easily lasered off, but the inner portion of the stone proved difficult to laser. The stone changed color to gold and silver, which was thought to be a bullet fragment (Fig. 1). Bullet debris and stone material were recovered through the urethra. The remaining bullet fragment had sharp edges and was unable to safely pass through the bladder neck and urethra. Of note, there was a scar on the right lateral wall of the bladder.

The patient returned to the operating room for an open cystolithotomy for definitive removal of the stone-encrusted bullet. An infraumbilical incision was made, the bladder was identified and incised, and the bullet fragment with surrounding stone was removed, measuring approximately 30 x 25 mm. The incision was closed in two layers, and the bullet was taken into police custody. Later postoperative computed tomography (CT) with and without IV contrast obtained for reasons not related to his GU system showed a hyperdensity in the bladder consistent with minimal residual bullet shavings embedded in the wall (Fig. 2).

Discussion

This case represents one of a few cases where a bullet migrated into the GU system and caused obstructive urinary symptoms. Since the GSW originally went through the bladder, the bullet likely settled extravasically. Over time, the bullet may have eroded through the bladder wall, which resulted in the scar seen on cystoscopy. The bullet served as a nidus for stone formation in the bladder and caused the obstructive

Abbreviations: CT, computed tomography; GSW, gunshot wound; GU, genitourinary.

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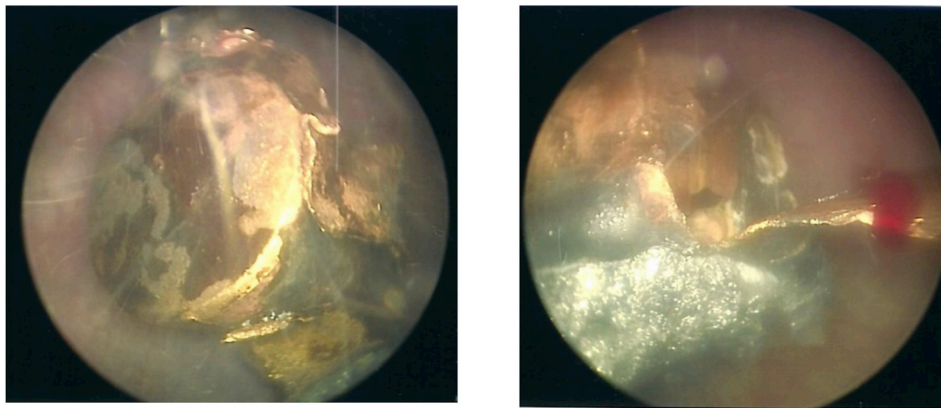


Fig. 1. Cystoscopy images of fragmented bladder stone revealing an underlying bullet.

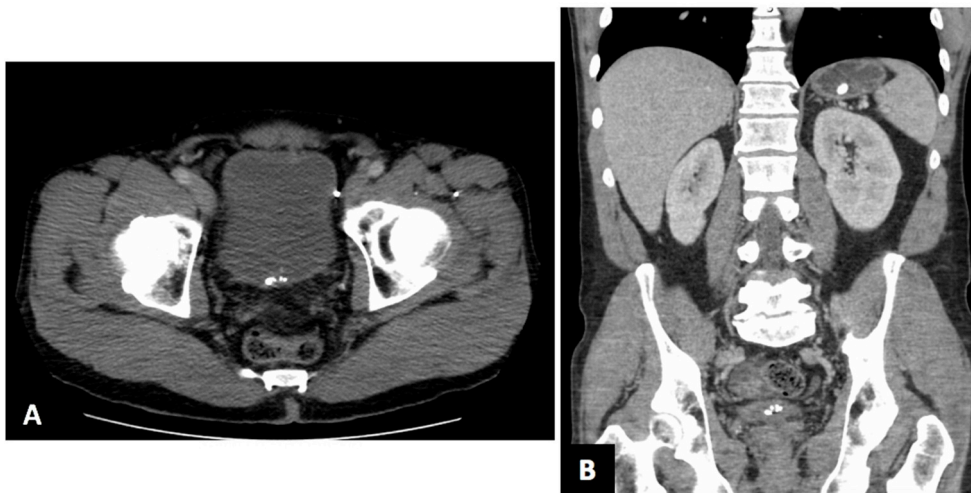


Fig. 2. (a) Axial and (b) coronal CT with intravenous contrast demonstrating residual bladder stone.

urinary tract symptoms.

Previous reports document bullets entering the urinary tract at different locations. There have been cases of bullet fragments and shrapnel found in the bladder.² There have also been reports of the bullets entering the GU system through the renal parenchyma then migrating into the ureter.³ In many of the cases, the bullet was removed from the bladder endoscopically.⁴ These cases, however, had a much shorter time from GSW to removal of the bullet and there was no stone formation surrounding the bullet. Our patient, however, needed a suprapubic cystostomy to remove the bullet fragment, due to the size and sharp edges.

Current literature suggests clear indications for immediate removal of a bullet fragment, including bullets found in joints, cerebrospinal fluid, vessels or the globe of the eye.⁵ There is limited data, however, on whether a bullet should be removed to prevent long-term complications. One such complication is lead poisoning from a bullet fragment, but even then, removal is not indicated until the patient is symptomatic or serum lead levels are elevated. In our patient, the immediate removal of the bullet was not mandatory, as it did not cause any damage to the structures mentioned above. While there is limited literature to support the removal of a bullet for long-term complications, the outcome of our case and similar cases suggest that the removal of a bullet may be considered in select patients to prevent bullet migration in the future.

Conclusion

While this is not the first case of bullet fragmentation migrating into the bladder, our patient had an eighteen-year delay from the time of the GSW to the time of urinary symptoms. To our knowledge, this represents one of the longest reported delays in patient presentation. After addressing the immediate indications for bullet removal at the time of trauma, clinicians should consider removal to prevent the long-term complications associated with bullet migration.

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Consent

Informed consent was obtained from the patient for publication of the case report.

Conflicts of interest

The authors do not have conflicts of interest to disclose.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.eucr.2019.101016>.

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