Cystogram may be unreliable in cases of gunshot wounds to the bladder: a case report

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KALORIN CM, DE E, ROSATI C. Cystogram may be unreliable in cases of gunshot wounds to the bladder: a case report. The Canadian Journal of Urology. 2007;14(3):3592-3594.

Introduction: *Gunshot wounds to the bladder are not uncommon; however it is unusual that a bullet come to rest within the urinary bladder. Properly performed plain film cystography is trusted as a highly sensitive tool for identifying significant bladder injuries due to both blunt and penetrating trauma. Several reports suggest that cystography may be less sensitive in cases of gunshot wounds to the bladder.*
Methods: *We report our recent experience with a gunshot wound to the bladder and review the use of cystography in the diagnosis of bladder injury in this setting.*
Results: *Anecdotal case reports suggest that cystography may fail to identify gunshot injuries to the bladder. No large studies have been performed to evaluate its utility in this unique trauma circumstance.*
Conclusions: *Although reliable for the diagnosis of bladder perforation in most trauma settings, cystography may fail to diagnose a penetrating bladder injury due to a gunshot wound. High clinical suspicion based on bullet trajectory, history, and physical exam should guide the workup and treatment of such patients.*

Key Words: gunshot, bladder, cystogram, trauma

Case report

A 17-year old male sustained a gunshot wound to the left buttock and was transferred via ambulance in stable condition. He complained solely of sharp pain in the buttock and upper left leg. Physical examination was notable for an entrance wound in the lateral left buttock without an identifiable exit wound. An anteroposterior radiograph of the pelvis revealed multiple small bullet fragments within the lower left portion of the pelvis and the main bulk of the bullet positioned centrally within the pelvis. Placement of a Foley catheter resulted in gross hematuria and urologic consultation was called. An 8 French feeding tube was passed 2 cm along side the

Accepted for publication April 2007

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Figure 1. Normal appearing cystogram with 400 ml of instilled contrast.

Foley and a retrograde urethrogram was obtained. This study was negative and was followed by a formal retrograde cystogram. After instillation of 400 ml of contrast, no extravasation was seen on the AP, oblique, or post drainage cystogram films, Figures 1 and 2.

Based on bullet trajectory toward the retroperitoneum and after one, self limited episode of hypotension, Trauma Surgery Services took the patient to the operating room for an exploratory laparotomy. Urology assisted in anticipation of performing intraoperative cystoscopy with retrograde contrast studies to identify any occult bladder or ureteral injuries.

Figure 2. Post void cystogram image with bullet fragment in central pelvis, but no signs of contrast extravasation.

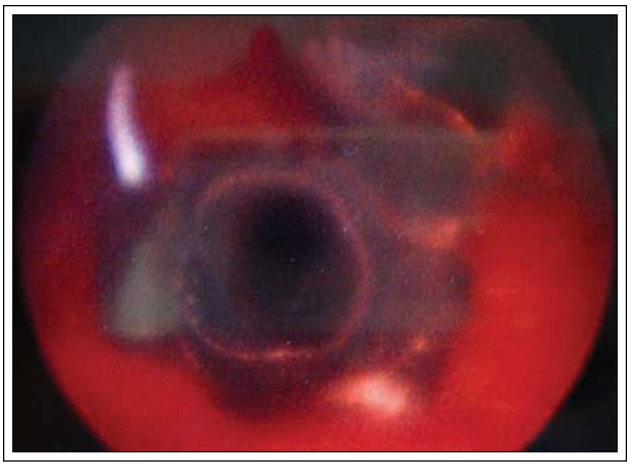

Figure 3. Cystoscopic image showing large bullet fragment with sharp edges.

Intraoperative rigid anoscopy and exploratory laparotomy were both unremarkable. There was no pelvic hematoma and the bullet fragments could not be located. Cystoscopy demonstrated two large bullet fragments within the urinary bladder; the largest fragment had several opposing sharp edges, Figure 3. The entrance wound to the bladder was identified on the left lateral wall at the four o'clock position, Figure 4. Bilateral retrograde pyelograms were negative for ureteral injury. The bullet fragments were removed via cystotomy, Figure 5 and the lateral wall wound was closed primarily. Suprapubic cystostomy and urethral catheter as well as a pelvic bulb suction drain were left in place. After 2 weeks of continuous drainage a cystogram was repeated, was negative, and the catheters were removed.

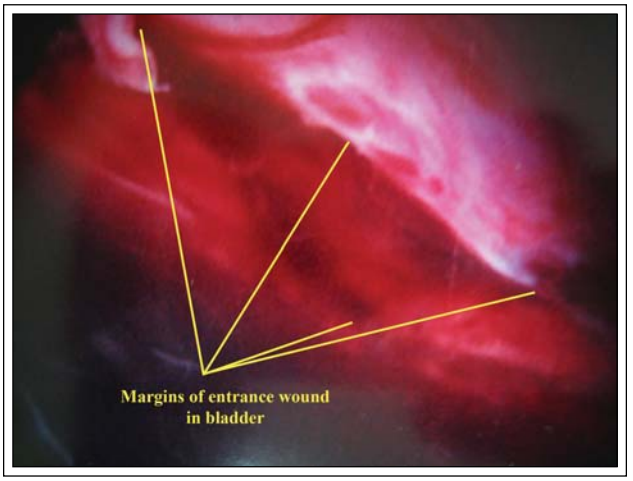

Figure 4. Cystoscopic image showing margins of the entrance wound into the bladder.

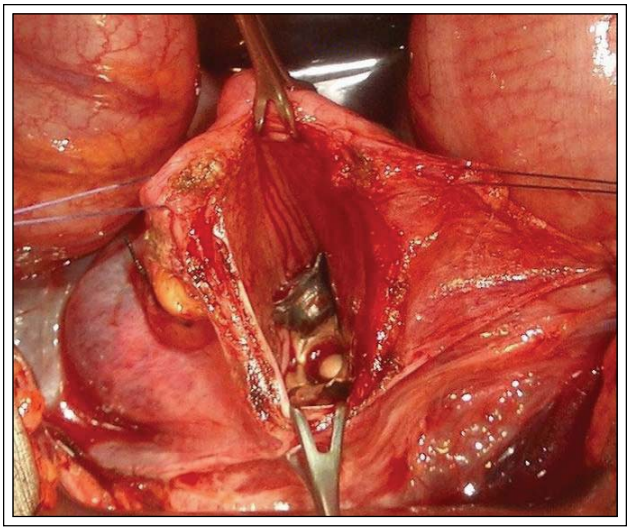

Figure 5. Intraoperative photo showing two large bullet fragments within the bladder (arrows). Bladder has been exposed through a cystotomy.

Conclusions

Gunshot wounds to the buttock result in penetrating injury to the bladder 20% of the time.[1] Although bullet injuries to the urinary bladder are not rare, in very few cases has the bullet come to rest within.[2-4] Gulanikar et al reported a bullet stopping within the bladder after a gunshot wound to the thigh, ultimately requiring removal via a delayed suprapubic cystotomy.[3] Kilic reported a case where a gunshot wound to the buttock also resulted in a bullet within the bladder. This patient had multiple injuries and underwent thoracotomy and exploratory laparotomy, however no pelvic bullet was found and cystoscopy was not performed since there was no hematuria. After Foley catheter removal 2 days later the patient spontaneously voided the intact bullet. Interestingly, a properly performed cystogram did not reveal any bladder injury in this case.[4]

False negative cystograms can occur, but are usually associated with contrast volumes less than 250 ml or a lack of obtaining post void films. A properly performed cystogram with 400 ml of contrast and a post drainage film is highly sensitive and specific.[5] Our case and the case presented by Kilic et al suggest that perhaps bullet injuries to the bladder are less likely to be seen on cystography. Unfortunately, the rarity of this scenario hinders a proper thorough clinical investigation. A possible reason for such false negative results is the cauterizing effect exhibited by a bullet traversing tissue and sealing the rent in the bladder as it enters. Perhaps bullet trajectory and clinical exam should raise higher suspicion for bladder injury in cases of gunshot wounds in the vicinity of the urinary bladder. □

References

1. Klein FA, Texter JH Jr, Snoddy WJ. Urologic injuries associated with penetrating wounds to the buttock. *Va Med* 1980;107:375.
2. Halkic N, Wisard M, Abdelmoumene A et al. A large bullet in the bladder. *Swiss Surg* 2001;7:139.
3. Gulanikar A, Pandey P, Terrell F. A bullet in the bladder. *Br J Urol* 1998;82:304.
4. Kilic D, Kilinc F, Ezer A et al. Spontaneous expulsion of a bullet via the urethra. *Int J Urol* 2004;11:576.
5. Cass AS. False negative retrograde cystography with bladder rupture owing to external trauma. *J Trauma* 1984;24:168.