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Case Report

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Abdominal gunshot wound: a case report

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ABSTRACT

Firearm injuries pose an escalating health concern worldwide and contribute significantly to trauma-related mortality and disability. We hereby report one such case of firearm injury where a 20-year-old male came to the trauma care centre with a penetrating abdominal injury, and the bullet was trapped in the pelvic bone. The associated bowel injuries were with intraoperative findings of jejunal perforations, colonic mesenteric injury and retroperitoneal haematoma that was managed by exploratory laparotomy with repair of associated injuries. The bullet, however, was not removed. The report aims to highlight the management of firearm injury and emphasise that bullet removal may not be necessary in all cases, depending on the site and structure of retention in relation to associated patient factors.

Keywords: Firearm injury, Retained bullet, Exploratory laparotomy, Perforation, Penetrating abdominal trauma

INTRODUCTION

Gun violence poses an escalating clinical and public health concern worldwide, with firearm-related injuries contributing significantly to trauma-related mortality and long-term disability.[1,2] The burden of these injuries spans multiple contexts, including homicide, suicide, accidental shootings, and interactions involving law enforcement. Societal factors such as firearm accessibility, legislative frameworks, and cultural norms further shape the incidence and nature of gunshot injuries.[3,4] Despite heightened awareness, the complexity of risk factors—including socioeconomic disparities, mental health issues, and community violence—has made meaningful reduction in gun violence an ongoing challenge.[5] Globally, firearm-related morbidity and mortality trends exhibit stark variation. High-income countries often have extensive trauma care systems yet may also experience higher rates of certain categories of firearm injuries, particularly homicides and suicides.[6] Conversely, low- and middle-income countries face infrastructural barriers that impede timely treatment, elevating the risk of complications or death. Furthermore, rural areas, even in higher-income regions, frequently present unique challenges: longer transport times, limited trauma centres, and reduced law enforcement presence.[7] Consequently, hospital-based data become invaluable, as they capture real world presentations, treatment pathways, and outcomes. Existing literature often underscores that young adult males are disproportionately affected by firearm violence.[8] This demographic remains at higher risk due to factors such as peer-group dynamics, community-level violence, and potential engagement with law enforcement operations. Anatomical site of injury also bears prognostic significance; head, neck, and trunk wounds typically carry elevated morbidity and mortality compared to extremity injuries.[5] Nonetheless, even extremity injuries can have profound socioeconomic implications, resulting in prolonged rehabilitation, potential disability, and psychological trauma for survivors.[6]

CASE REPORT

A 20-year-old male patient came to trauma care centre (TCC), Government Medical College, Nagpur with an alleged history of being shot at around 12:00 noon. Patient

was taken to the nearby hospital, where primary resuscitation was done and a computed tomography (CT) (abdomen + pelvis) – plain was done. CT scan was suggestive of air foci and pneumoperitoneum adjacent to the right lobe of the liver, concerning for sealed-off bowel perforation and no definitive bowel perforation along the bullet trajectory and evidence of a foreign body (bullet) lodged in the left iliac bone (wing) and was referred to a higher centre for further management. On arrival at TCC, the patient was conscious and oriented with a Glasgow coma score of E4V5M6, pulse rate 130/minute, blood pressure 90/60 mmHg, and oxygen saturation of 86% on room air and 99% on 8 litres/minute of oxygen support via a Hudson's mask. On limb examination, patient had no restricted range of movements of both lower limbs and no evidence of motor or sensory neurological deficit On per-abdominal examination, generalised tenderness and guarding were present with evidence of distension. On local examination, a single gunshot entry wound was seen in the left lumbar region (Figure 1).

Figure 1: Entry wound (sutured at primary care hospital).

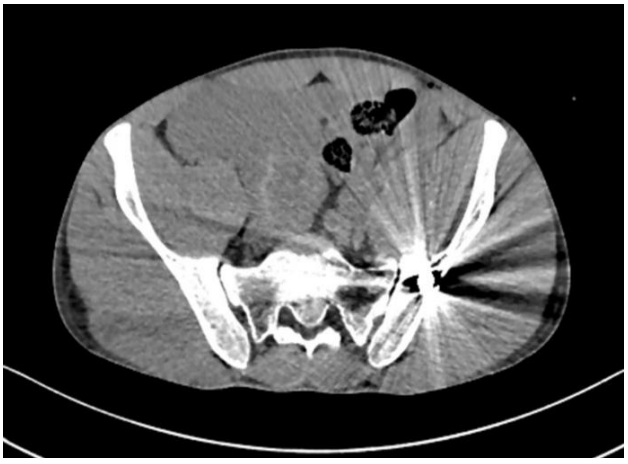

Figure 2: Pre-operative plain computed tomography (of abdomen & pelvis) axial section showing foreign body (bullet) inside left iliac wing.

The patient was resuscitated and shifted for CT scan at TCC, which was suggestive of gross hemoperitoneum, pneumoperitoneum and hyperdense foreign body in left iliac bone (likely suggestive of bullet) (Figures 2 and 3).

Figure 3: Pre-operative plain computed tomography (of abdomen and pelvis) coronal section showing foreign body (bullet) inside left iliac wing.

The patient was immediately shifted for emergency laparotomy. The abdomen was opened by midline laparotomy incision, and about 700 ml hemoperitoneum was drained (Figure 4).

Figure 4: Approximately 700 ml blood and clots (combined) drained.

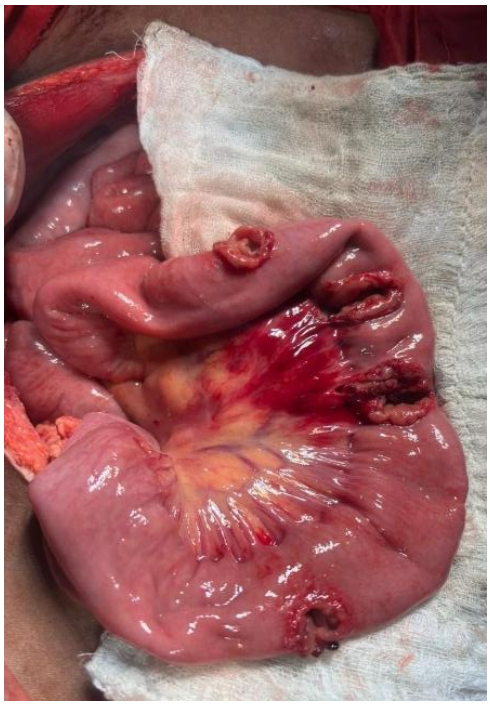

Figure 5: Jejunal perforations.

Figure 6: Tear in mesentery of descending colon.

Figure 7: Retroperitoneal haematoma.

Total 4 jejunal perforations were found, which were: about 25 cm distal to the duodenojejunal (DJ) flexure of size 2×2 cm, about 30 cm distal to the DJ flexure of about 5×5 cm (through and through perforation), about 30 cm distal to the DJ flexure of about 5×5 cm (through and through perforation on the mesenteric side), and about 50 cm distal to the DJ flexure of size 2×2 cm (Figure 5) and a rent was found in the mesentery of descending colon (Figure 6) with retroperitoneal haematoma (Figure 7).

The bullet then entered the retroperitoneal space and got lodged in the left iliac wing. It was inferred that the bullet entered the abdominal wall via left lumbar region, penetrating the peritoneum, perforating jejunum in the way of trajectory, it entered the retroperitoneal space via mesentery of descending colon then traversing the pelvic cavity for a few centimetres and finally got lodged into the wing of left iliac bone. Bullet was localised intra-operatively using C-arm X-ray filming (Figure 8). On table decision was taken for leaving the bullet in place after considering the hemodynamic stability of patient and location of the bullet.

Figure 8: Intra-operative c arm X-ray showing foreign body (bullet) lodged in left iliac wing.

About 30 cm of jejunum was resected using 60 mm endo GI staplers and side to side jejunojejunostomy was done. Rest of the abdominal contents were examined and found normal. Thorough peritoneal wash was given. Abdominal drains were placed in subhepatic and pelvic spaces. Abdomen was closed in layers. Patient tolerated the procedure well and post-operatively was uneventful. Patient was kept nil by mouth for 72 hours. Oral sips were allowed on post-operative day (POD) 3 followed by soft

diet on POD 4 and full diet on POD 5. Patient was mobilised on POD 2 and abdominal drains were removed on POD 6. On 2 weeks, 2 months and 3 months post-operative follow-up, the patient has no symptoms of abdominal discomfort and no complaints of compromised range of movements and difficulty in walking. There is no evidence of loss of sensory or motor function in bilateral lower limbs.

DISCUSSION

The intensity and severity of firearm injuries is directly proportional to the distance of the bullet fired. Injuries caused by projectiles fired less than three meters away cause massive tissue damage and are usually lethal.[9,10] Thus, tissues with a higher specific gravity have more severe impact, mostly bone and muscle tissue and parenchymal organs. The data in the analyses concerning the part of the body that is most often injured vary greatly. According to a few analyses, the most commonly injured organs are the head and chest, while other studies support that the abdominal organs as the most commonly injured.[11] There is no standard treatment for patients with penetrating abdominal injuries. Previously, urgent surgical exploration was considered the initial step to treatment. However, analysing this approach, some authors claim that it was associated with a higher incidence of complications, a higher percentage of unnecessary explorations, and a longer duration of hospital stay. Conservative treatment measures are gaining importance in hemodynamically stable patients day by day.[12-14] Renz et al show the frequency of complications after unnecessary laparotomies is as high as 41.3%.[15] Also, laparoscopy can be used for diagnosis and, in some cases, the treatment of injuries, thereby reducing the incidence of complications that arise due to an open surgical approach.[16]

The line of management depends on hemodynamic stability of the patient. Hemodynamically stable patients permit more time for physical examination, laboratory, and radiological diagnosis. But critically unstable patients with severe injuries demand urgent surgical treatment without further delay and diagnosis. Some authors point out that the preparation of the operating room should begin immediately after the admission of unstable patients. A number of complications accompanying gunshot injuries have been reported. Potential complications after gunshot injuries are mainly determined by the site of injury and organs damaged. Except for bleeding, which must be controlled initially (damage control surgery planned for restoring the anatomy), most common complications are tissue and organ damage, fractured bones, infections of wound, partial or complete paralysis (in the case of spinal cord injuries), and psychological effects, especially in young patients. Patients with chest and abdominal injuries are more likely to be re-admitted to hospital due to complications.[17] The most common complications are wound infection, wound dehiscence, sepsis in the early period, small bowel syndrome, and intestinal adhesions with ileus as late complications.[18] The wound infection rate (32.1%) is slightly higher compared to the overall wound infection rate, probably because of open bone fractures, perforating wounds, anaemia, and generalized poor immune response.[19,20]

Debridement and irrigation are often indicated in bullet injuries with articular involvement; but not routinely done for extra-articular injuries. Treatment of extraarticular gunshot injuries to the extremities are frequently performed without aggressive debridement, and local wound care is a preferred option in most cases.[21] There are no data to support extended debridement of bullet tracks.[22,23] There are a few reported cases of necrotizing fasciitis in the literature. Despite those—often fatal—cases, it could not be shown that aggressive surgical treatment would have altered and prevented the tragic outcomes.[24] If extra-articular pelvic fracture is associated with bowel injuries, formal orthopaedic fracture debridement is not required, even with concomitant intestinal viscus injuries.[25]

Independent of the location of the retained bullet/metallic fragments, a clear indication for surgical treatment is the formation of an abscess. This is not usually caused by the bullet itself, but by smoke and dirt particles that have gained entry by the impact of the entering projectile. When clearing the abscess, there is often the chance to remove the bullet in the same setting.[26]

When the bullet impinges on a nerve or a nerve root and causes pain to the patient it should be removed. However, it has been shown that there is no evidence of the prevention or minimization of future pain when bullets are removed in patients suffering from spinal cord injury due to a gunshot. Some studies can prove that pain might get severe when caused by a gunshot, but there is no evidence that bullet removal will be beneficial to those patients regarding future pain.[27,28]

Retained metallic fragments do not have to be extracted at all costs. There is no proof of increasing infection rates when retained foreign bodies are left inside. In intracranial lesions due to missiles, repeat surgery is necessary when a brain abscess has occurred. Depressed bone fragments and/or cerebrospinal fluid leaks are associated with a higher rate of infection.[29-31]

A special situation develops when the bullet is required for forensic evaluation and investigation. Here, the patient and the treating surgeon should be in full agreement that the removal procedure will not result in increased pain, complications, or injury. It is essential that both the patient and the treating surgeon agree on the removal procedure. It may be that the surgeon is ordered to remove the bullet by a court order, and the bullet can then be removed against the patient's willingness for the procedure.[32]

The following are clear indications for bullet removal when the bullets - are found in joints, CSF, or the globe of the eye; lead to impingement on a nerve or a nerve root;

are lying within the lumen of a vessel, resulting in a risk of ischemia or embolization; cause lead poisoning; are seen or clinically palpated at examination; and require removal for a medico-legal examination

In all other cases, the indication should be reviewed with utmost care prior to removal.[33] However, the ethical issue with retained bullet remains that the patient will be judged every time he/she discloses his medical records as and when necessary, this will have a psychological impact and may hamper his/her quality of life.

Gun violence is a complex and multifaceted problem which requires multi-disciplinary solutions and prevention programs.

CONCLUSION

Firearm Injuries are one of the dire surgical emergencies needing prompt decision for better surgical outcomes and eventually better quality of life of the patient. There may be ethical, legal and social issues related to retained bullet, but the risk of extraction leading to morbidity and in some cases mortality takes precedence over all other issues. If it can be removed easily in the same setting, it should be removed; otherwise, it can be removed later, or a decision to leave it alone can be made. A documentation of this fact and counselling of the patient regarding the same must be done.

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REFERENCES

1. Gani F, Sakran JV, Canner JK. Emergency department visits for firearm-related injuries in the United States, 2006–14. Health Aff (Millwood). 2017;36(10):1729-38.
2. Fowler KA, Dahlberg LL, Haileyesus T, Gutierrez C, Bacon S. Childhood firearm injuries in the United States. Pediatrics. 2017;140(1):e20163486.
3. Gabor T. Trends and patterns of firearm deaths in high-income OECD countries. Can J Criminol. 2016;58(2):171-92.
4. Richardson EG, Hemenway D. Homicide, suicide, and unintentional firearm fatality: comparing the United States with other high-income countries, 2003. J Trauma. 2011;70(1):238-43.
5. Branas CC, Nance ML, Elliott MR, Richmond TS, Schwab CW. Urban-rural shifts in intentional firearm death: different causes, same results. Am J Public Health. 2004;94(10):1750-5.
6. Wintemute GJ. The epidemiology of firearm violence in the twenty-first-century United States. Annu Rev Public Health. 2015;36:5-19.
7. Cook PJ, Ludwig J. Guns in America: National survey on private ownership and use of firearms. National Institute of Justice. 1997.
8. Goins WA, Thompson J, Simonton SC, Robinson F, Hardin W. Demographic aspects of abdominal gunshot wounds: a prospective study. Am Surg. 1992;58(2):96-101.
9. Stefanopoulos P, Tsiatis N, Herbstein J. Gunshot wounds. In: Encyclopedia of Forensic Sciences. 3rd ed. Boca Raton (FL): CRC Press. 2023;3:75-98.
10. Shrestha R, Kanchan T, Krishan K. Gunshot wounds forensic pathology. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. 2023.
11. Nasrullah M, Razzak JA. Firearm injuries presenting to a tertiary care hospital of Karachi, Pakistan. J Inj Violence Res. 2009;1:27-31.
12. Costa G, Tierno SM, Tomassini F, Venturini L, Frezza B, Cancrini G, et al. The epidemiology and clinical evaluation of abdominal trauma: an analysis of a multidisciplinary trauma registry. Ann Ital Chir. 2010;81:95-102.
13. Beuran M, Gheju I, Venter MD, Marian RC, Smarandache R. Non-operative management of splenic trauma. J Med Life. 2012;5:47-58.
14. Cirocchi R, Boselli C, Corsi A, Farinella E, Listorti C, Trastulli S, et al. Is non-operative management safe and effective for all splenic blunt trauma? A systematic review. Crit Care. 2013;17:185-93.
15. Renz BM, Feliciano DV. Unnecessary laparotomies for trauma: a prospective study of morbidity. J Trauma. 1995;38:350-6.
16. Gaines BA, Rutkoski JD. The role of laparoscopy in pediatric trauma. Semin Pediatr Surg. 2010;19:300-3.
17. Fu Y, Lewis MR, Mitchao DP, Benjamin RE, Wong M, Demetriades D. Gunshot wound versus blunt liver injuries: different liver-related complications and outcomes. Eur J Trauma Emerg Surg. 2023;49:505-12.
18. Bieler D, Kollig E, Hackenberg L, Rathjen JH, Lefering R, Franke A, et al. Penetrating injuries in Germany—epidemiology, management and outcome: an analysis based on the TraumaRegister DGU®. Scand J Trauma Resusc Emerg Med. 2021;29:80.
19. Lasebikan OA, Omoke NI, Onyemaechi NO, Iyidobi EC, Anetekhai WI. Prospective analysis of extremity gunshot injuries treated in a Nigerian regional trauma center. Int J Med Health Dev. 2019;24:100-6.
20. Omoke NI. Analysis of risk factors for gunshot wound infection in Nigerian civilian trauma setting. World J Surg. 2016;40:1885-91.
21. Watters J, Anglen JO, Mullis BH. The role of debridement in low-velocity civilian gunshot injuries resulting in pelvis fractures: a retrospective review of acute infection and inpatient mortality. J Orthop Trauma. 2011;25(3):150-5.
22. Geissler WB, Teasedall RD, Tomasin JD, Hughes JL. Management of low velocity gunshot-induced fractures. J Orthop Trauma. 1990;4(1):39-41.
23. Howland WS, Jr, Ritchey SJ. Gunshot fractures in civilian practice. An evaluation of the results of

limited surgical treatment. J Bone Joint Surg Am. 1971;53(1):47-55.
24. Omoshoro-Jones JA, Nicol AJ, Navsaria PH, Zellweger R, Krige JE, Kahn DH. Selective non-operative management of liver gunshot injuries. Br J Surg. 2005;92(7):890-5.
25. Rehman S, Slemenda C, Kestner C, Joglekar S. Management of gunshot pelvic fractures with bowel injury: is fracture debridement necessary? J Trauma. 2010;71(3):577-81.
26. Kobbe P, Frink M, Oberbeck R, Tarkin IS, Tzioupis C, Nast-Kolb D, et al. Treatment strategies for gunshot wounds of the extremities. Unfallchirurg. 2008;111(4):247-54.
27. Richards JS, Stover SL, Jaworski T. Effect of bullet removal on subsequent pain in persons with spinal cord injury secondary to gunshot wound. J Neurosurg. 1990;73(3):401-4.
28. Waters RL. Gunshot wounds to the spine: the effects of bullet fragments in the spinal canal. J Am Paraplegia Soc. 1984;7(2):30-3.
29. Brandvold B, Levi L, Feinsod M, George ED. Penetrating craniocerebral injuries in the Israeli involvement in the Lebanese conflict, 1982–1985. Analysis of a less aggressive surgical approach. J Neurosurg. 1990;72(1):15-21.
30. Chaudhri KA, Choudhury AR, al Moutaery KR, Cybulski GR. Penetrating craniocerebral shrapnel injuries during ‘‘Operation Desert Storm’’: early results of a conservative surgical treatment. Acta Neurochir (Wien). 1994;126(2-4):120-3.
31. Taha JM, Saba MI, Brown JA. Missile injuries to the brain treated by simple wound closure: results of a protocol during the Lebanese conflict. Neurosurgery. 1991;29(3):380-3.
32. Dada MA, McQuoid-Mason DJ. Medico-legal aspects of trauma and emergency care. Transactions (J Coll Med S Afr). 2004;47(1):57-60.
33. Dienstknecht T, Horst K, Sellei RM, Berner A, Nerlich M, Hardcastle TC. Indications for bullet removal: overview of the literature,and clinical practice guidelines for European trauma surgeons. Eur J Trauma Emerg Surg. 2012;38:89-93.

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