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Retained Intramammary Bullet Caused by a Falling Projectile in a Young Woman

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Case Report

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Abstract

Background

Falling bullet injuries occur when projectiles fired into the air descend under the influence of gravity and strike individuals on the ground. Although these injuries may cause significant morbidity and mortality, breast involvement is exceptionally rare. We present a unique case of a retained intramammary bullet caused by a falling projectile and discuss its clinical and forensic implications.

Case Presentation:

A 21-year-old woman presented with a retained bullet in her left breast ten days after experiencing sudden pain while sitting in a café. Initial evaluation at a local hospital revealed a penetrating injury confined to the breast without intrathoracic involvement. On admission to our institution, physical examination demonstrated a healed entry wound in the upper outer quadrant of the left breast. Computed tomography revealed a metallic foreign body located deep within the breast tissue adjacent to the pectoral fascia, without evidence of pneumothorax, hemothorax, or thoracic injury. The patient underwent surgical removal of the projectile under general anesthesia using fluoroscopic guidance. A 7.65-mm bullet was successfully extracted through a periareolar incision. The postoperative course was uneventful, and the patient was discharged without complications.

Discussion

Falling bullet injuries frequently present diagnostic challenges because victims often do not witness the shooting event and may remain clinically stable despite significant tissue penetration. Breast injuries caused by falling projectiles are exceedingly uncommon. In the present case, the bullet penetrated deeply into the breast and reached the pectoral fascia without causing intrathoracic injury. A review of the PubMed-indexed literature did not identify a previously reported case of a retained intramammary bullet resulting from a falling projectile.

Conclusion

This case highlights that falling bullets can cause clinically significant penetrating breast injuries despite the absence of hemodynamic instability or thoracic involvement. Early radiological evaluation and appropriate surgical management are essential for accurate diagnosis and optimal outcomes. Increased awareness among clinicians may facilitate timely recognition and treatment of these rare injuries.

Introduction

A "tired bullet" or "falling bullet" injury occurs when a projectile fired into the air reaches its maximum height, loses its initial kinetic energy, and subsequently descends under the influence of gravity. Despite the reduction in velocity during its upward trajectory, a falling bullet may still retain sufficient kinetic energy upon impact to penetrate human tissue and cause severe injury or death. Such injuries have increasingly become a public health concern, particularly in regions where celebratory or indiscriminate firearm discharge is common(1–4).

Unlike conventional firearm injuries, falling bullet injuries often occur unexpectedly, without an identifiable shooter or apparent shooting event. Victims may not hear a gunshot, and healthcare providers may initially overlook the possibility of a firearm-related injury. Consequently, diagnosis and treatment can be delayed, increasing the risk of morbidity and mortality (3, 5).

Previous studies have shown that the head, neck, and thorax are the most frequently affected anatomical regions because falling bullets typically strike the body at a near-vertical angle. Cranial injuries are associated with particularly high mortality rates(3, 6). Although numerous reports have described intracranial, cervical, and thoracic injuries caused by falling bullets, breast involvement remains exceedingly rare in the literature.

We present a rare case of a retained intramammary bullet caused by a falling projectile in a young woman and discuss its clinical, forensic, and public health implications in light of the current literature.

Case Presentation

A 21-year-old woman with no significant past medical history presented to our General Surgery outpatient clinic with a retained bullet in her left breast. Ten days before presentation, she had been sitting in a café when she suddenly felt pain in her left breast. She was immediately transported to a local emergency department.

Initial evaluation at a district hospital revealed a penetrating injury confined to the left breast without evidence of thoracic penetration. The patient was hemodynamically stable, and her vital signs were within normal limits. Given the absence of life-threatening findings, she was discharged with recommendations for outpatient follow-up and was subsequently referred to our institution for further evaluation and management.

Ten days later, she presented to our institution reporting the presence of a bullet within her breast. Physical examination demonstrated a crusted entry wound located in the upper outer quadrant of the left breast. No palpable mass or other abnormality was detected.

Thoracic computed tomography (CT) revealed diffuse edema involving the upper outer quadrant and retroareolar region of the left breast. A metallic foreign body consistent with a bullet was identified in the deep breast tissue, adjacent to the pectoral fascia. No pneumothorax, hemothorax, or intrathoracic injury was observed.

Surgical removal of the retained projectile was recommended because of the patient's persistent symptoms and the potential risk of infection associated with a retained foreign body. After detailed discussion of the risks and benefits, the patient elected to undergo surgical treatment. After completion of preoperative preparations, the patient underwent surgery under general anesthesia. Using fluoroscopic guidance, a periareolar incision was made through the trajectory of the entry wound. Careful dissection allowed localization and extraction of a 7.65-mm bullet lodged near the pectoral fascia.

Following hemostasis, a mini-vacuum drain was placed, and the breast tissue was closed in anatomical layers. The extracted bullet was transferred to hospital law enforcement authorities for forensic evaluation. Due to the medicolegal nature of firearm-related injuries, the extracted projectile was preserved and transferred to law enforcement authorities for ballistic examination.The postoperative course was uneventful. The drain was removed on postoperative day two, and the patient was discharged in good condition without complications.

At the 1-month follow-up visit, the patient remained asymptomatic. The surgical wound had healed uneventfully, and no breast deformity, infection, or other complications were observed. The cosmetic outcome was satisfactory.

Discussion

Falling bullet injuries represent a unique subset of firearm-related trauma with significant medical, forensic, and social implications. Although less common than direct firearm injuries, they are capable of causing severe morbidity and mortality(4, 7, 8).

These injuries frequently occur during celebrations, weddings, sporting events, or other social gatherings where firearms are discharged into the air. The increasing prevalence of civilian firearm ownership and inadequate firearm safety practices have contributed to the rising incidence of such injuries worldwide (4, 7, 9).

Breast trauma caused by firearm projectiles is uncommon and is generally associated with direct gunshot wounds. Management strategies depend on the location of the projectile, associated tissue damage, risk of infection, patient symptoms, and cosmetic considerations. In cases involving retained intramammary foreign bodies, surgical removal may be indicated to prevent chronic pain, infection, foreign body reaction, patient anxiety, and potential diagnostic confusion during future breast imaging examinations. In the present case, the deep location of the projectile adjacent to the pectoral fascia and the patient's persistent symptoms supported operative management.

One of the most challenging aspects of falling bullet injuries is their atypical clinical presentation. Unlike conventional firearm injuries, victims often do not witness the shooting event and may not hear a gunshot. Consequently, neither patients nor healthcare providers initially suspect a firearm injury. Malik

et al. reported that many patients presented several hours after injury, and some were initially misdiagnosed and discharged without appropriate radiological investigation(7, 9).

Prompt recognition is therefore critical. A thorough physical examination and appropriate imaging studies should be considered in patients presenting with unexplained penetrating wounds, particularly when the mechanism of injury is unclear. Failure to identify retained projectiles may result in delayed diagnosis, inadequate treatment, and medicolegal complications.

Breast injuries caused by firearm projectiles are uncommon and are usually associated with direct gunshot wounds. Reports of retained intramammary bullets resulting from falling projectiles are exceedingly rare. Owing to the relatively soft tissue composition of the breast and the typically low residual kinetic energy of falling bullets, the clinical presentation may be subtle, potentially delaying diagnosis and treatment. Our review of the PubMed-indexed literature identified reports of retained bullets within the breast; however, we were unable to identify a previously published case of a retained intramammary bullet resulting from a falling projectile, highlighting the unique nature of the present case (9, 10).

The present case is notable for several reasons. First, breast involvement caused by a falling bullet is exceptionally uncommon, with very few similar cases reported in the literature. Second, despite the projectile penetrating deeply and reaching the level of the pectoral fascia, no intrathoracic injury occurred. Third, despite harboring a retained projectile adjacent to the pectoral fascia, the patient remained clinically stable for ten days after the incident, highlighting the potential for delayed presentation and diagnosis in such cases.

An additional noteworthy aspect of this case is the favorable cosmetic outcome. Although penetrating breast injuries may result in contour deformity, fat necrosis, or aesthetic concerns, our patient demonstrated normal breast appearance without deformity at the 1-month follow-up evaluation. This finding suggests that timely surgical removal through a cosmetically acceptable periareolar approach can achieve both effective treatment and satisfactory aesthetic results.

From a forensic perspective, falling bullet injuries frequently present diagnostic challenges because the shooting location and responsible individual are often unknown. Delayed recognition may compromise crime scene investigation and ballistic analysis, limiting the ability to establish criminal responsibility. Furthermore, underreporting and misclassification may hinder accurate epidemiological assessment of these injuries.

Given the rarity of breast involvement and the potential for serious complications, clinicians should maintain a high index of suspicion for retained projectiles in patients presenting with unexplained penetrating injuries. Early radiological evaluation and timely surgical management are essential to prevent complications and ensure optimal outcomes.

Conclusion

Falling bullet injuries continue to represent an important yet underrecognized public health problem. Although uncommon, these injuries can result in significant morbidity and mortality and may present with atypical clinical findings that delay diagnosis and treatment.

This case demonstrates that even in the absence of hemodynamic instability or thoracic injury, a falling bullet may penetrate deeply into breast tissue and require surgical intervention. Healthcare professionals should consider falling bullet injury in the differential diagnosis of unexplained penetrating wounds and perform comprehensive physical and radiological evaluation when appropriate.

Increased public awareness, improved firearm safety education, and stricter enforcement of firearm regulations may contribute to reducing the incidence of preventable injuries caused by falling bullets.

Declarations

Authors' contribution

GD: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, Visualization, Project Administration.

GE: Investigation, Validation, Writing – Review & Editing, Supervision.

BK: Investigation, Validation, Writing – Review & Editing, Supervision.

All authors contributed to the study, critically reviewed the manuscript, approved the final version, and agreed to be accountable for all aspects of the work.

Conflicts of interest

The authors certify that they have no conflict of interest with any financial organization regarding the material discussed in this manuscript.

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Ethics Statement

Ethical approval was not required for this single-patient case report according to institutional policy. Written informed consent was obtained from the patient for publication of this case report and the accompanying clinical and radiological images.

Clinical Trial Number

Not applicable.

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Figures



Figure 1

Entry wound of the left breast



Figure 2

Intraoperative localization of the bullet



Figure 3

Extracted 7.65-mm bullet



Figure 4

Axial CT demonstrating retained bullet adjacent to the pectoral fascia