

Arrow-shot injuries following herder–farmer clashes in Gombe, Nigeria: A case series

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Abstract

Although rare in developed countries, arrow-shot injuries remain a significant cause of penetrating trauma in rural regions of developing nations, particularly in areas affected by herder–farmer conflicts. Despite being low-velocity projectiles, arrows can cause severe penetrating injuries to the head and neck, thorax, abdomen and extremities, often requiring surgical intervention. Data from Gombe State are scarce, and these injuries appear to occur more frequently during harvest periods when herder-farmer clashes are more common.

We report three cases of arrow-shot injuries sustained during herder – farmer clashes in Gombe, Nigeria. The injuries involved the neck, thorax and retroperitoneum with damage to major structures including the internal jugular vein, lung, diaphragm and kidney. All patients underwent operative management following appropriate imaging and resuscitation.

All patients had favourable outcomes, with no major postoperative complications or mortality. This case series highlights the potential life-threatening nature of arrow shot injuries and emphasises the importance of early resuscitation, appropriate imaging, and controlled surgical extraction. Improved surveillance and targeted trauma preparedness during high-risk periods may further reduce morbidity and mortality associated with these injuries.

Keywords: Arrow-shot injuries, Herder-Farmers Conflict, Penetrating trauma.

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Introduction

Injuries from arrow shots are rare in developed countries due to the development of modern firearms and ballistics¹. However, it is still seen in rural areas in developing countries where conflicts between herders and farmers are common¹. Bow and arrow are common weapons of war among locals used during conflict between herders and farmers over grazing land, farm land disputes between farmers, armed banditry, cattle rustling, political violence and other forms of criminality²⁻⁴. Arrows are common because they are cheap and easy to fabricate. Even though arrows are classified as low-velocity projectiles, they can cause significant penetrating injuries^{1,4}. Injury severity depends on several factors such as distance fired, trajectory, anatomical region involved and arrowhead design (e.g. barbed versus Broad-headed tips). Some of these arrows are thought to be dipped in poisonous substances, such as snake venom and faecal matter, to increase their deadly potential⁵. Being low-velocity projectiles, they are usually lodged in the body and may initially tamponade injured vessels. Hence, unskilled prehospital removal can precipitate massive haemorrhage. Furthermore, they should not be removed blindly depending on the arrowhead design, as pushing it along its trajectory may be safer than extraction in the opposite direction⁶.

Any part of the body can be affected, and many case series in Nigeria have reported arrow injuries affecting the neck, orbit, face, abdomen and the thoracic region, often requiring complex surgical intervention^{4,7,8}.

Data from Gombe state remain sparse, and based on clinical observation, arrow shot injuries appear to demonstrate a seasonal pattern with more cases encountered during the harvest period when herder-farmer interactions intensify. However, the true burden is underestimated due to reliance on traditional care^{4,7}.

In the present series, all 3 cases were presented within four days during the most recent harvest season, suggesting increased occurrence during this time frame.

This series aims to describe the clinical presentation, pattern of injury, management strategies and outcome of patients presenting with arrow shot injuries during herder-farmer conflicts in Gombe and its environment. Highlighting the seasonal pattern of presentation underscores the need for improved surveillance and targeted surgical readiness during the high-risk period.

Case presentations

Case 1

A 26-year-old man was referred from a private hospital in Biu to the Accident and Emergency Unit of the Federal Teaching Hospital, Gombe, with a penetrating arrow injury to the neck of one day's duration. He sustained the injury after being shot with an arrow by Fulani herdsman while attempting to prevent them from grazing on his farmland. There was a history of bleeding from the injury site, which was controlled with direct pressure. He also complained of mild pain on swallowing but denied difficulty in breathing, change in voice, loss of consciousness, or progressive neck swelling. No other injuries were sustained. The initial presentation was at a private facility in Biu, from where he was referred without intervention.

On examination, he was conscious, afebrile, and hemodynamically stable, with no respiratory distress. An arrow was noted to be impacted on the right side of the posterior triangle of the neck at the level of the mid-sternocleidomastoid muscle (Fig. 1). There was surrounding soft tissue swelling without an expanding hematoma, air bubbling, or crepitus, though the area was tender. Other systemic examinations were unremarkable. A plain radiograph of the neck demonstrated

a metallic arrow lodged in the right lateral soft tissues at the C2–C3 level, raising concern for possible vascular injury.

The patient received intravenous antibiotics and antitetanus prophylaxis and was prepared for surgery. He subsequently underwent neck exploration under general anaesthesia. Intraoperative findings revealed a barbed arrow traversing deep to the sternocleidomastoid muscle and lodging within, and tamponading the right internal jugular vein, with no active haemorrhage at the time of exploration. The incision was extended laterally from the entry wound, and following careful sharp and blunt dissection, the barbs and tip of the arrow were exposed. Proximal and distal vascular control was achieved, the arrow was gently removed, and the internal jugular vein was repaired primarily. Hemostasis was secured, the wound irrigated, and closed in layers over a drain.

Postoperatively, he was managed with intravenous ceftriaxone/sulbactam 1.5 g 12-hourly, paracetamol 600 mg 8-hourly, and nefopam 20 mg 8-hourly, and intravenous fluid with close monitoring. He made an uneventful recovery; the drain was removed 24 hours postoperatively, and he was discharged on the fourth postoperative day and scheduled for outpatient follow-up.



Figure 1 – Arrow impacted on the right posterior triangle of the neck.



Figure 2 – Anteroposterior neck radiograph showing the retained arrow.



Figure 3. Lateral neck radiograph showing the retained arrow.



Figure 4. Post Extraction and Wound Closure.

Case 2

AY, a 21-year-old male farmer, presented to the Accident and Emergency Unit of the Federal Teaching Hospital, Gombe, with multiple arrow-shot injuries to the anterior chest wall and left gluteal region, as well as lacerations to the scalp and left heel, sustained approximately two hours before

presentation. He was attacked while harvesting crops on his farm when Fulani herdsmen attempted to graze their cattle on his farmland. In trying to stop them, he was shot with arrows to the chest and left gluteal region and sustained machete cuts to the scalp and left heel. There was associated bleeding from the scalp, chest, and gluteal wounds, which was controlled with direct pressure. He complained of difficulty in breathing but denied dizziness or syncope. He was brought immediately to the emergency department following initial haemorrhage control.

On examination, he was conscious and in respiratory distress but not pale. Vital signs revealed tachycardia with a normal blood pressure. An impacted arrow was noted at the right parasternal region at the 5th intercostal space, directed inferomedially toward the right costal margin, as well as another arrow lodged in the left gluteal region. There was no active external bleeding. Multiple scalp lacerations and a deep laceration to the left heel with complete Achilles tendon transection were also noted. Chest examination revealed a centrally placed trachea, reduced chest expansion on the right hemithorax, dull percussion notes, and reduced air entry over the right lung fields.

An emergency right-sided chest tube was inserted on presentation, and the scalp lacerations were sutured in the emergency room. Chest and pelvic radiographs demonstrated retained arrow fragments in the right anterior chest wall and left lateral pelvis. Laboratory investigations, including complete blood count and serum electrolytes, were within normal limits. He subsequently underwent surgery comprising right thoracotomy with arrow extraction, repair of lung lingula and diaphragmatic lacerations, left gluteal wound exploration with arrow removal, and repair of the left Achilles tendon.

Intraoperatively, the thoracic arrow was found to have entered just to the right of the sternum at the fourth intercostal space, traversed anterior to the right ventricle, pierced the lower lobe of the right lung and the diaphragm, and abutted the diaphragmatic surface of the right lobe of the liver. The gluteal arrow was lodged within the left gluteus medius muscle. A right anterolateral thoracotomy was performed, the lung lingula and diaphragm were dissected to expose the barbed arrowhead, and the arrow was removed retrogradely. The lung and diaphragm were repaired, hemostasis secured, and the chest tube repositioned to optimize drainage. The gluteal arrow was removed following careful dissection of the gluteus medius, and the transected Achilles tendon was repaired using a modified Kessler technique with application of a backslab.

Postoperatively, the patient was managed in the intensive care unit with intravenous ceftriaxone/sulbactam 1.5 g 12-hourly, paracetamol 600 mg 8-hourly, and nefopam 20 mg 8-hourly. His recovery was uneventful, and he was transferred to the surgical ward after 24 hours. The chest tube was removed on postoperative day four, and he was discharged seven days later after completing antibiotics, with no postoperative complications.



Figure 5. Impacted Arrow in the Chest



Figure 6. Impacted Arrow in the Left Gluteal Region

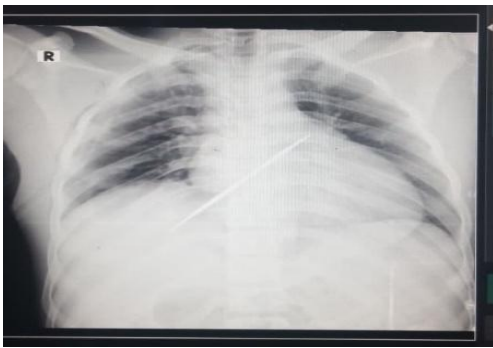


Figure 7. Chest X-ray – Anteroposterior View.



Figure 8. Pelvic X-ray – Anteroposterior View.

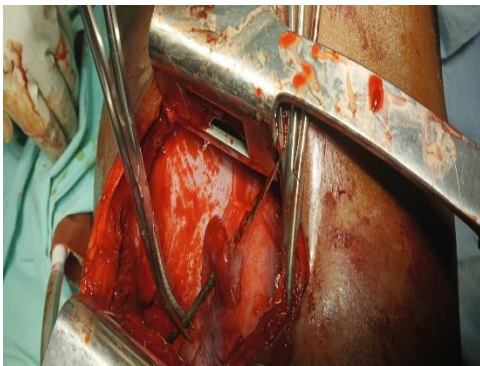


Figure 9. Intraoperative Thoracotomy – Demonstrating the Arrow in the Lungs

Case 3

A 23-year-old Fulani man was referred to our centre with a penetrating arrow injury to the left middle back of eight hours' duration following a dispute over farmland. He reported bleeding from the injury site and a single episode of hematuria. There was no history of dizziness, loss of consciousness, chest pain or difficulty in breathing. There was no other major injury sustained.

On clinical examination, he was conscious and not in respiratory distress with an arrow impacted in the left mid-back, and there was no active bleeding. He was hemodynamically stable. Plain abdominal X-ray showed an arrow in situ with possible left renal penetration. CT IVU showed the arrow traversing the upper pole of the left kidney, exiting medially with probable associated liver penetration.

The patient was prepared for surgery and underwent laparotomy via a midline incision under general anaesthesia with endotracheal intubation. A careful dissection was carried out until the arrow barbs were fully exposed at the renal hilum. The arrow barbs were gently clipped, and the arrow was gently removed retrogradely after cutting the extra abdominal wooden shaft. Primary repair of the renal injury was performed, reinforced with retroperitoneal fat.

Postoperatively, the patient had antibiotics and analgesics and had an uneventful recovery and was subsequently discharged with outpatient follow-up arranged.



Fig. 10 Impacted Arrow to the Back



Fig. 11 Sample of the extracted Arrow

Discussion

Arrow shot injuries are uncommon in the developed world. However, they are still seen in developing countries and are important causes of penetrating trauma, especially in rural parts of sub-Saharan Africa, including Northern Nigeria. This series highlights the clinical challenges, management and surgical outcome of three patients with penetrating arrow shot injuries involving different regions of the body.

All three patients in this series are male, consistent with previous reports from Northern Nigeria. A report of two cases of penetrating arrow injuries to the neck from Kano involved only male patients,¹ while another case series from the same region reported four male patients.⁴ Likewise, a retrospective analysis of thirty patients with orofacial arrow injuries at Federal Medical Centre Nguru, Northeast Nigeria, found that all affected patients were male³. The male predominance observed across these studies probably reflects the greater participation of man in farming activities and their frontline involvement during herder-farmer conflicts, predisposing them to such injuries.

Although arrows are classified as low-velocity weapons, they are capable of causing significant injuries if not managed properly and can be life-threatening. The degree and severity of the injuries depend on the distance from which the arrow is fired, the trajectory and the anatomical region involved. In this series, the injuries involved critical anatomical regions, including the neck (internal Jugular vein), thorax (Lung and diaphragm), pelvis, musculoskeletal

structures and the retroperitoneal region (Left kidney). These findings are consistent with other reports. Previous reports have described injuries involving the neck, nose and maxillofacial region, highlighting the diverse anatomical sites that may be affected.^{4,5} Although some injuries may appear localised, they can be life-threatening if not managed appropriately, particularly when major neurovascular structures are involved.^{4,5} A 10-year retrospective review of 73 patients at the University of Maiduguri Teaching Hospital showed that the thorax is the most commonly affected region, followed by the head and neck.⁹ In the present series, both regions were involved, with one patient sustaining injuries to multiple anatomical sites. The Predominance of thoracic and head-and-neck injuries may be due to the large exposed surface area of the thorax and the tendency of the assailants to aim vital structures of the neck for maximum damage. Recognition of these injury patterns is important for trauma planning, surgical preparedness, and training in the management of penetrating arrow injuries.

In this series, all three cases presented within a four-day window during the harvest season. Although this is only a clinical observation rather than an epidemiological finding, it aligns with the period of intensified herder-farmer interactions fueled by competition over farmland and harvested crops. This finding is consistent with a previous report at Aminu Kano Teaching Hospital, Kano, in which all cases of arrow-shot injuries occurred in the setting of herder-farmer conflict, although the timing of presentation was not specified.⁴ These observations suggest that periods of heightened herder-farmer tension may be associated with increased risk of arrow-shot injuries and underscore the need for enhanced surgical preparedness and trauma system readiness during such high-risk periods.

The pattern of presentation and management depends on the organ affected. All patients in this series were managed in line with ATLS protocol, following established principles for penetrating trauma. At the initial evaluation, life-threatening injuries that will necessitate immediate surgical exploration were looked for. All three patients were hemodynamically stable, and there was no need for immediate surgical intervention as part of the resuscitation. Notably, arrow injuries tend to remain lodged in the body, which may tamponade injured vessels and limit life-threatening haemorrhage. This was clearly demonstrated in case 1, in which the arrow was lodged and tamponading the internal jugular vein and in case 3, where renal injury was present yet the patient was hemodynamically stable. This temporary tamponade can be deceptive, and an ill-advised prehospital removal or manipulation can precipitate catastrophic bleeding. In all three cases, the arrow was not removed prehospital or in the emergency department. Instead, controlled surgical exploration under general anaesthesia allowed for direct visualisation, proximal and distal vascular control (where applicable), and careful extraction—often in an antegrade manner to avoid further tissue damage from barbed tips. This is in line with the fact that controlled surgical extraction under direct visualisation, with adequate proximal and distal vascular control where necessary, remains the cornerstone of management.

Imaging plays a vital role in the preoperative evaluation of these patients. Plain radiographs are useful in identifying the presence and general trajectory of retained arrows. A CT scan gives more details and is usually recommended for all patients who are hemodynamically stable. In our series, only one patient, Case 3, had a CT scan due to financial constraints. In the other patients, we depended on X-ray and clinical features to guide surgical exploration. Where

available, advanced imaging such as CT angiography is recommended, especially for penetrating neck and thoracic injuries; however, financial and infrastructural constraints frequently limit its use in low-resource environments.

The outcome for this series was favourable, with no mortality or major post-operative complications recorded. This highlights the importance of adequate resuscitation, adherence to trauma principles, timely surgical intervention, and multidisciplinary care, even in resource-constrained settings. It is important to note that multidisciplinary surgical readiness was essential, as evidenced by the need for vascular repair in Case 1, thoracotomy with visceral repair in Case 2, and laparotomy with renal repair in Case 3. This underscores the importance of prompt referral to a tertiary care centre with appropriate surgical expertise.

Conclusion

Arrow shot injuries remain a relevant cause of penetrating trauma in our environment, particularly in the context of herder–farmer conflicts. Clinical presentation varies depending on the anatomical region involved and whether prehospital attempts have been made to remove the arrow. Early resuscitation following Advanced Trauma Life Support (ATLS) principles, appropriate imaging, and controlled surgical extraction by a multidisciplinary team are essential for optimising outcomes. Strengthening referral pathways to tertiary centres and improving trauma preparedness during high-risk periods may further reduce morbidity and mortality associated with these injuries.

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