

Arrow in the heart: Our experience

Ibrahim Aliyu, Ismail Mohammed Inuwa¹

Departments of Pediatrics, ¹Surgery-Cardiothoracic Unit, Aminu Kano Teaching Hospital, Bayero University Kano, Kano State, Nigeria

Address for correspondence:

Dr. Ibrahim Aliyu,
Department of Pediatrics,
Aminu Kano Teaching
Hospital, Bayero University
Kano, Kano State, Nigeria.
E-mail: ibrahimaliyu2006@yahoo.com

ABSTRACT

Arrow-related injuries are rare in most developed countries and may occasionally occur as sports-related injuries; however, this is still a problem in most crisis-prone areas in Nigeria. Though arrow-related injuries are classified as low velocity injuries, they may cause enormous damage to vital structures as in the case of a penetrating arrow-related cardiac injury in a Fulani boy; though he presented late and it took almost 48-hours before surgical intervention, he was successfully managed and discharged home without any complication.

Access this article online

Website: www.nigjcardiol.org

DOI: 10.4103/0189-7969.130131

Quick response code



KEY WORDS: Arrow-related cardiac injury, low velocity injury, Nigeria

INTRODUCTION

Arrow-related injuries still occurs in Nigeria, especially in crisis-ridden communities where it is used as weapon, while in developed countries, it rarely occurs, and it is seen in few cases of sport-related accidents.^[1,2] Several body sites may be involved; however, arrow-related penetrating cardiac injury is a rare event. Penetrating arrow injuries, though classified as low velocity injury, may be life-threatening, especially if vital organs like the skull and brain,^[3] lungs, and the heart are affected; more so, the arrow head may be laced with poison and barbed making extraction difficult. Therefore, the case of an 18-year-old Fulani boy with an arrow penetrating cardiac injury is reported.

CASE REPORT

An 18-year-old boy who was healthy had a penetrating arrow-related chest injury following a fight with his friend; this was on the left side of the chest; the arrow was an aluminum type and the protruding part moving with each heart beat. No attempt was made to pull it off because they were aware of the consequence and

there was no history of active bleeding from the site. He presented 4-hours later to the hospital in his village and was referred after 18-hours to our hospital, and he had surgery 48-hours after injury. The cardiovascular examination were; a pulse rate of 90/min, blood pressure of 100/70 mm Hg; and on the precordium, the metallic arrow was protruding and moving with every heart-beat [Figure 1], It was about 10 cm from the midline and about 3 cm below the left nipple at the level of the left 5th intercostal space; he had normal 1st and 2nd heart sounds and no murmur. He was conscious but in painful distress. Based on the site and extent of penetration, the diagnosis of penetrating arrow-related cardiac injury was made.

The chest X-ray showed the arrow within the cardiac silhouette [Figure 2], electrocardiogram was essentially normal; pre-operation echocardiogram was not done, but post-operation echocardiogram was essentially normal.

He had general anesthesia (halothane), pancuronium, and atropine and had exploratory left antero-lateral thoracotomy through the 5th intercostal space; intra-operative findings were: The left lung was spared,

hemopericardium (about 75 mL of blood), the arrow penetrating into the right ventricle about 1 cm from the left anterior descending artery with no active bleeding, about 4 cm of the arrow was intracardiac. Double purse string was applied (prolene 2/0) around the arrow and mosquito artery forceps was used to dilate the arrow tract to facilitate easy extraction. Systolic blood pressure was reduced to 100 mm Hg by increasing the dose of halothane in order to reduce the risk of bleeding during the extraction process, and no cardiac arrhythmia was noticed. Chest drain was inserted. He made remarkable improvement and was discharged 7 days later [Figure 3].

DISCUSSION

Origin of arrows date back to about 64,000-years ago in South African Sibudu cave where they were used for hunting.^[4,5] Sites involved in arrows-related injuries vary with the surrounding circumstance,^[6,7] In violence-related events, the intent is usually to cause grave bodily harm or death; therefore it is not surprising witnessing cardiac-related injuries as it was in this index case.

Clinical presentations of penetrating cardiac injury may vary from a clinically stable patient-as it was in the index case- to state of hemodynamic instability (shock).^[8]



Figure 1: Arrow protruding from the chest wall



Figure 2: Chest X-ray showing arrow penetrating the heart

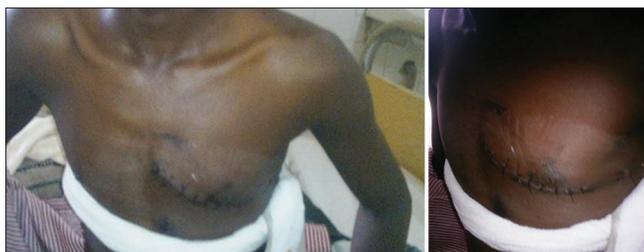


Figure 3: Post-operation status after successful management

Common determinants of good prognostic outcome include right ventricular injury, single chamber injury, absence of pleural breach, stab injury, cardiac tamponade, aggressive resuscitation, and early operative intervention (those who had surgery within 30 minutes of arrival to the Accident and Emergency Unit have higher survival rate than those who had delayed surgery).^[9,10] Though our case presented late, he was hemodynamically stable and had right ventricular involvement; but he recovered without any complication.

Sternotomy exposes the heart and great vessels and allows for adequate evaluation of extent of intra-thoracic injury; however, we instead used left antero-lateral thoracotomy approach based on our past experience from an earlier managed nail in the heart; the arrow was very close to the sternum, and attempt at retracting the sternum may dislodge it further increasing the risk of bleeding and causing more tissue damage. Unlike in nail-related cardiac injury, the arrow was barbed; therefore, making it difficult to extract, hence the need to expand the size of the arrow tract in the myocardium to allow for easy extraction, while the purse strings ensured hemostasis.

Though there had been earlier reported arrow extraction from the heart in Nigeria,^[11] this was done under cardiac bypass. Our case is the first document extraction in a beating heart in north-west Nigeria to the best of our knowledge.

CONCLUSION

Arrow-related penetrating cardiac injury is rare, and it can be successfully managed in the absence of cardiac bypass machine, which is the typical scenario in resource-limited setting.

REFERENCES

1. Launikitis RA, Viegas SF. Arrow shaft injury of the wrist and hand: Case report, management, and surgical technique. *South Med J* 2009;102:77-8.
2. Rayan GM. Archery-related injuries of the hand, forearm, and elbow. *South Med J* 1992;85:961-4.
3. Ogunleye AO, Adeleye AO, Ayodele KJ, Usma MO, Shokunbi MT. Arrow injury to the base of the skull. *West Afr J Med* 2004;23:94-6.
4. Wadley L, Jacobs Z. sibudu cave, kwazulu-natal: Background to the excavations of middle stone age and iron age occupations. *South Afr J Sci* 2004;100:145-51.
5. Backwell L, d'Errico F, Wadley L. Middle Stone Age bone tools from the howiesons poort layers, sibudu cave. *South Afr J Archaeol Sci* 2008;35:1566-80.
6. Ali N, Gali BM. Pattern and management of chest injuries in maiduguri, Nigeria. *Ann Afr Med* 2004;3:181-4.
7. Magziga AG. Arrow injuries in north-east nigeria. *West Afr J Med* 2003;22:106-9.
8. Thourani VH, Feliciano DV, Cooper WA, Brady KM, Adams AB, Rozycki GS, *et al*. Penetrating cardiac trauma at an urban trauma center: A 22-year perspective. *Am Surg* 1999;65:811-6.
9. Campbell NC, Thomson SR, Muckart DJ, Meumann CM, Van Middelkoop I, Botha JB. Review of 1198 cases of penetrating cardiac trauma. *Br J Surg* 1997;84:1737-40.

Aliyu and Inuwa: Arrow in the heart

10. Asensio JA, Berne JD, Demetriades D, Chan L, Murray J, Falabella A, *et al.* One hundred five penetrating cardiac injuries: A two year prospective evaluation. *J Trauma* 1998;44:1073-82.
11. Nwiloh J, Edaigbini S, Danbauchi S, Aminu MB, Oyati A. Arrow injury to the heart. *Ann Thorac Surg* 2010;90:287-9.

How to cite this article: Aliyu I, Inuwa IM. Arrow in the heart: Our experience. *Nig J Cardiol* 2014;11:54-6.

Source of Support: Nil, **Conflict of Interest:** None declared.

