

Cash Report

A rare case of traumatic brachial artery injury

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ABSTRACT

A relatively large proportion of peripheral arterial injuries are constituted by traumatic brachial artery injuries. Injuries to the arteries of the upper extremity and have the potential to significantly impact the outcome of the trauma patient. We report a case of 26 yr. old male patient with two glass-cut wounds in his right upper extremity, one in the arm and another in forearm. The patient presented with history of pain, brisk bleeding, pale and cold right upper extremity. It was associated with absent radial and ulnar pulses and profound neurological deficits. The brachial artery was diagnosed and confirmed by angiography and was repaired with reverse right saphenous vein graft in interpositioning. Prompt management of the traumatic brachial artery injuries is mandatory to maximize the survival of the patient and to prevent complications like compartment syndrome.

Keywords: Brachial artery injury, Angiography, Vascular surgical procedures

INTRODUCTION

In the upper extremity, the brachial artery is the most frequently injured due to its vulnerability.¹ A relatively large proportion of peripheral arterial injuries are constituted by traumatic brachial artery injuries.² Injuries to the arteries of the upper extremity and have the potential to significantly impact the outcome of the trauma patient.³ Approximately 28% of all vascular injuries are due to injury to the brachial artery.⁴ Nerve injuries are generally associated with brachial artery injuries because the median nerve courses with the brachial artery throughout its length and the radial and ulnar nerves parallel portions of the brachial artery.⁵ A thorough examination followed by meticulous surgical intervention and a carefully monitored postoperative course is needed to avoid the associated complications of these challenging injuries.⁶

CASE REPORT

A 26 yr. old male patient was admitted in the trauma ward of Sawai Man Singh Medical College, Jaipur, with two glass-cut wounds in his right upper extremity, one in the arm and another in forearm. The patient presented with history of pain, brisk bleeding, pale and cold right upper extremity. It was associated with absent radial and ulnar pulses and profound neurological deficits. On clinical examination we found that active finger movements, warmth and capillary refill were absent in right upper limb. Pre-gangrenous changes started appearing in the fingers of right upper limb.

Grossly two exposed wounds were present in the right upper limb. One wound is present in the right upper arm which was $15 \times 10 \times 5$ cm³. The other wound was present in the forearm below the cubital fossa and was $16 \times 12 \times 6$ cm³ in dimension. Both the wounds were present with exposed muscles, tendons and arms and severe active bleeding, as shown in Figure 1.

Initially the systolic BP of the patient was 80 mm of Hg. Intravenous fluid and urgent blood transfusion was done and systolic BP was normalized to 120 mm of Hg and patient was taken to urgent exploration. Written informed consent was sought from the patient before operation. Angiography showed cut off in the right brachial artery as depicted in Figure 2.

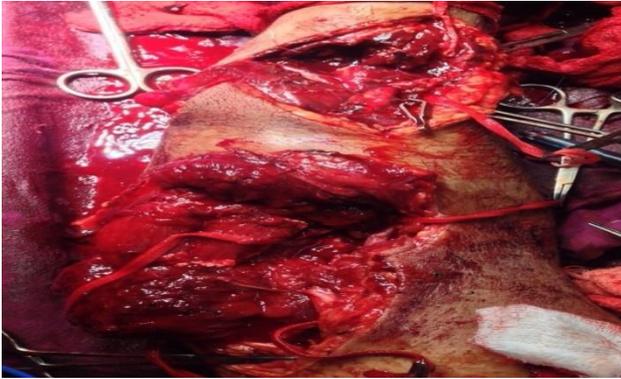


Figure 1: Two wound in right upper extremity with exposed muscles, tendons and nerves.

After proper painting and draping, right brachial plexus block was given and exploration of wounds was done. Right brachial artery was found to be injured just above the bifurcation and the gap between the cut ends was 3cm as it can be clearly seen in Figure 3.



Figure 2: Angiography showing cut off in the right brachial artery.

The median nerve was identified and separated from the brachial artery. The brachial artery was repaired with reverse right saphenous vein graft in interpositioning as seen in Figure 4. On further exploration right radial artery and ulnar artery were also found to be cut. Repair of radial and ulnar artery was done by end to end anastomosis using non- absorbable prolene suture. Another partial circumferential cut was present in distal radial artery which was repaired with a patch of great saphenous vein.

There was difficulty in closing the wound that was present in the forearm. Therefore, plastic surgeon was called and split skin grafting was done to close the wound. Patient was carefully monitored postoperatively. It was found that capillary refill and warmth in hand was normalized after the operation but residual hand deformity was present because of multiple nerve injuries.



Figure 3: Injured right brachial artery with gap of 3cm between the cut ends

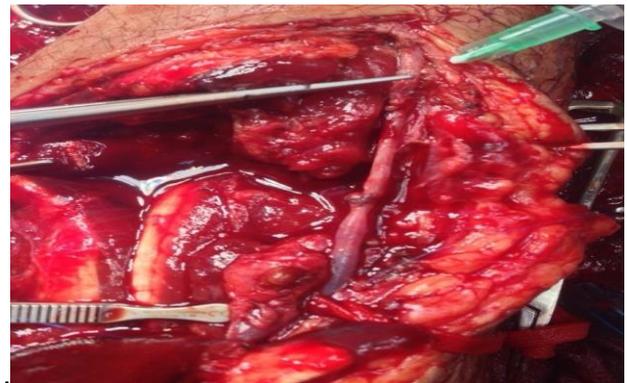


Figure 4: Brachial artery repaired with reverse right saphenous vein graft.

DISCUSSION

A huge number of literatures are available addressing traumatic brachial injuries but still there is a paucity in the research work about it. It has been documented in previous literatures that in recent years, the limb salvage rate has reached nearly 100% because of early transport of patients to the hospital. Early diagnosis, increased surgical experience, and developments in the treatment of hypovolemic shock and the use of antibiotic therapy also improved survival of the patient.^{2,7,8}

Associated morbidity and mortality rates with brachial artery injuries depend on the cause of the injury itself, which vein or tendon is injured, and whether musculoskeletal and nerve injuries are also present.² Penetrating trauma is the most common cause of a vascular injury in the upper extremity. The usual types of

blunt and penetrating injuries, supracondylar fractures or dislocation of the humerus are that other causes of injury to the brachial artery.⁹

Kazim Ergunes et al reported that, doppler ultrasonography of the upper extremity has been shown to be as specific and sensitive as arteriography in detecting brachial artery injuries.² On the other hand, one of the study stated the role of angiography in patients with brachial artery injury appears to be controversial.^{1,2}

Earlier it has been documented that end-to-end anastomosis is preferable if it can be performed without tension or damage to major collateral vessels, otherwise the saphenous-vein interposition graft is the next best choice.^{2,10} It has better patency rates and better resistance to infection compared with synthetic grafts as seen in our case report.^{2,10}

While, Hunt et al suggested that arterial revascularization should be ideally followed by skeletal stabilization and nerve and tendon repair.¹¹

The rate of functional disability after operative procedure ranges from 27% to 44% if the injury to the upper extremity is associated with nerve injuries.^{[11][12]} Although the signs of acute arterial injury may be masked by extensive collateral circulation in the elbow, but all the brachial artery injuries should be repaired.^{1,13}

CONCLUSION

Prompt management of the traumatic brachial artery injuries is mandatory to maximize the survival of the patient and to prevent complications like compartment syndrome. To conclude this article might fulfill the gap in the original research work in this field.

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