

Management of vascular trauma in a provincial hospital

P.K. MATHEW¹, THOMAS KAINGE¹, F. KAPUA¹ AND R. BARUA¹

Mendi Hospital, Southern Highlands Province, Papua New Guinea

SUMMARY

Three cases of major vessel injuries referred to Mendi Hospital during 1993-1994 are reported. All three vessels were repaired successfully. The surgical management of these cases is described.

Introduction

Penetrating injuries from arrow wounds are the most common cause of vascular injuries in the highlands, usually acquired in tribal fights. Some patients reach hospital late and may require amputation. Even with limited facilities every attempt should be made to repair major vessel injuries to save lives and avoid unnecessary amputations. We describe three cases of major vessel injuries which were repaired successfully.

Case 1

A 20-year-old Melanesian male was seen in the Casualty Department of Mendi Hospital with a three months' history of pain and swelling in the left popliteal fossa following an arrow injury. The arrow was pulled out in the village. He received antibiotics at the aid post for the painful swelling in his leg. As his symptoms got worse he was referred to us.

Clinical examination showed a swollen left leg and a fluctuant tender swelling with raised local temperature in the left popliteal fossa. A diagnosis of abscess was made and incision and drainage (I & D) was done. This resulted in a gush of fresh blood and clots from the wound. The wound was packed and a pressure bandage applied. He was then admitted to the ward.

On admission he had a swollen left leg with no palpable distal pulses. He was resuscitated with blood and fluids and commenced on antibiotics (chloramphenicol and cloxacillin). He was then taken to theatre for exploration.

At exploration it was noted that there were plenty of infected clots in the popliteal fossa and profuse bleeding from a tear on the popliteal artery. The laceration was repaired with difficulty. His postoperative recovery was uneventful and he was discharged home on day 14.

At review after six weeks the swelling of the leg had completely subsided and despite absent distal pulses there was good perfusion. He could walk without any difficulty.

Case 2

An 18-year-old Melanesian male attended a peripheral hospital with a history of an arrow wound to his left lower thigh. Exploration was attempted through the entry wound on the lower thigh anteriorly. As the wound started to bleed profusely the wound was packed and the patient referred to Mendi for possible amputation.

On admission to Mendi Hospital the left leg was grossly swollen and there were no palpable distal pulses. Capillary circulation was good. He was commenced on intravenous chloramphenicol and cloxacillin, resuscitated with blood and fluids and taken to theatre for exploration.

At exploration it was noted that he had a tear on the popliteal artery. There was good backflow. The artery was repaired.

The postoperative period was complicated by infection of the arrow entry wound. The swelling of his leg gradually subsided and his

¹ Mendi Hospital, PO Box 67, Mendi, Southern Highlands Province 251, Papua New Guinea

dorsalis pedis pulse was palpable with good volume. He was discharged on day 22. The patient did not return for follow-up.

Exploration technique employed

We used the following technique for exploration of the above two cases.

Proximal control was achieved by a vertical incision in the groin. The femoral vessels (common femoral, superficial femoral and profunda femoris arteries) were dissected out and controlled with nylon tapes.

The popliteal artery was approached by a medial vertical incision. The popliteal vessels were identified and the laceration on the popliteal artery was exposed. Distal control was difficult as we had no vascular clamps. To achieve distal control we used finger pressure by the assistant. The tear on the vessel was repaired with 0000 nylon. Evacuation of clots in the distal artery was not attempted as there was no Fogarty's catheter available.

The bleeding points were coagulated and wound closed leaving a tube drain in situ. The drain was removed 48 hours postoperatively.

Case 3

A 40-year-old Melanesian male was admitted to Mendi Hospital with a history of arrow injury to his chest. Attempted removal of the arrow in the village resulted in breakage of the arrow and retention of the arrow head in his chest. Other than this he was asymptomatic.

Clinical examination demonstrated the entrance wound to the right of the upper sternum. There was no palpable foreign body. Examination of the respiratory and cardiovascular systems did not reveal any abnormality. Chest X-ray was unremarkable. He was commenced on antibiotics.

Exploration was done in theatre and the arrow was found to be piercing the sternum. Removal of the arrow resulted in profuse bleeding from the wound. The arrow was reinserted to control the bleeding and patient was prepared for thoracotomy. The chest was opened through a left lateral approach. The arrow was found to be penetrating the superior vena cava. The arrow was removed and the vein was repaired with 000 dextron.

The patient made an uneventful recovery and was discharged home on day 19. He too did not return for follow-up.

Discussion

The aim of presenting these case reports is to share our experience of repairing traumatized vessels with our surgical colleagues in Papua New Guinea who are often faced with lack of proper equipment and drugs. A literature search did not reveal any reports on vascular injuries, except for a recent article by Golpak (1).

The most common causes of vascular injuries in the west are iatrogenic injuries, blunt trauma acquired in road traffic accidents and penetrating injuries from gun shots and stab wounds. In the highlands of Papua New Guinea penetrating injury from arrow wounds in tribal warfare is the most common cause of vascular trauma. These cases are often referred for amputation. If the arrow wound is in the chest it is the general belief of the relatives that arrow injury to the heart will almost always result in death. Fingleton (2) in his series has clearly demonstrated that arrow injury to the myocardium, major vessels and mediastinum can be successfully repaired with limited facilities.

Under ideal circumstances an arteriogram should be done to localize the injury, especially in blunt trauma. As Sedwitz and Shackford (3) explain, proximal and distal control of the vessels should be achieved before exploration of the injured site. The patient should be given 50-75 units/kg of heparin and distal thrombectomy should be done using a Fogarty's balloon catheter before repair of the vessel. Postoperatively, an on-table arteriogram should be done to assess the patency. These facilities were not available to our patients.

Our first case presented three months after injury. Repair of the artery was difficult as the tissues were fragile, presumably from sepsis. We were unable to do distal thrombectomy and heparinization as we did not have a Fogarty's catheter or heparin. This may be why he did not acquire patency of the arteries distally. However, he had good capillary circulation which was probably from the development of collaterals.

Our second case presented early after the injury. The patient was referred for amputation. We could not do a distal thrombectomy or heparinize him. We could use only aspirin for its anti-platelet properties. Postoperatively he had a good pulse.

In our third case relatives gave a history of retained arrow in the chest. Even though he was asymptomatic we decided to explore the entry site. On removal of the arrow, the gush of blood made it clear that the arrow had been lodged in one of the major vessels. Thoracotomy, removal of the arrow and repair of the vessel saved the life of the patient. He did not have any intrathoracic sepsis, most likely, as suggested by Fingleton (2), because "the arrows themselves are very clean and are stored in the roof of the huts where the warriors live, and so are exposed to the smoke and heat of the fire always alight inside".

We conclude with the recommendation that any patient with suspected vascular injury

should be referred at the earliest to the nearest hospital with surgical facilities. Every attempt should be made to repair the injured vessel before contemplating amputation. The outcome is better if repair is done early as shown by our second case. Results may not be excellent but the patient will have good use of the limb if the repair is successful.

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