

Pattern, Management, Results And Complications Of Vascular Injuries Of The Extremities. Report From A Hospital In Jammu

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Abstract

Vascular injuries of the extremities are a major cause of mortality and morbidity. It is therefore important to diagnose and treat these injuries on an emergency basis. We looked at 34 patients who presented to our department with such injuries and evaluated the results of management.

INTRODUCTION

Major arterial injury can result in disastrous complications ranging from functional disability to death. In the early phases of the Korean war the policy of major arterial ligation resulted in an amputation rate of 60-70%. However with the institution of arterial repair, this rate was considerably reduced.[1]

DeBakey et al in 1946 found that arterial injuries resulted in an amputation rate of nearly 75%.[2] Concluding on a depressing note they wrote that 'no procedure other than ligation is applicable to a majority of vascular injuries'.

Although primary repair of acute vascular injuries was performed 200 years ago by Lambert, it became a procedure of choice only in the late 1950s.

Pasch et al wrote that a combination of arteriography, fasciotomy, autologous interpositional grafts and completion arteriography can result in salvage rates approaching 100%.[3]

Unfortunately the transport rates, theatre facilities and absence of high quality instruments and investigations compounds management of these injuries in the less developed areas of the world.

The purpose of this study was to confirm whether these principles of limb salvage in vascular injuries are applicable and reproducible in smaller centers in relatively less developed centers around the world.

MATERIAL AND METHODS

The study was conducted on 34 patients who presented to the department of orthopaedics, government medical college Jammu.

All patients were resuscitated in the emergency department in accordance with the ATLS guidelines. Bleeding was controlled at the outset by applying compression or by clamping the vessels if the local compression was thought to be inadequate.

After obtaining history all patients underwent a detailed general physical examination, followed by local examination. Doppler examination of distal pulses was carried out in all the cases.

In 33 patients clinical suspicion with Doppler confirmation was enough to warrant a surgical exploration. One patient underwent an arteriography before surgical exploration.

All patients underwent surgery within an hour of presentation. In all cases preoperative parenteral antibiotics were combining a third generation cephalosporin and an aminoglycoside were used. In contaminated wounds, metronidazole was added.

General, regional or spinal anaesthesia was used depending on the feasibility. The injured vessel was explored and bleeding controlled 2-3 cms from the cut ends facilitating intimal examination. In all cases with associated fractures, fixation was done prior to the commencement of the vascular repair.

Proximal and distal clots were removed by a Fogarty catheter. Grafts were taken from the sphenous vein when required.

Artery repair was done with a continuous fine monofilament 5-0, 6-0 prolene.

Open full forearm and leg fasciotomy was done to relieve pressure. The repair was covered with soft tissue.

Arterial pulses were monitored by a portable Doppler unit and tissue oxygenation by a pulse oximeter.

LMW heparin 2500 daily was given once a day subcutaneously for ten days. This was followed by oral anti platelet drugs for six months.

RESULTS

The age range of our patients was 7-65 years with an average age of 27.38 years. 30 of the 34 patients were males. 11 cases had suffered the injury in a road traffic accident, 7 due to a firearm, 6 due to a fall, 3 due to a stab, 3 in industrial accidents while as 4 cases had suffered these injuries iatrogenically. 21 cases had a penetrating trauma.

The brachial artery was the most commonly injured artery with 16 patients suffering this injury. 10 patients had a femoral artery involvement. there were 4 axillary, 3 popliteal and 2 posterior tibial injuries.

11 cases presented within 6 hours and 23 after this period.

19 cases had an associated fracture or dislocation. 14 patients had associated venous trauma while as 8 patients had an associated nerve injury.

The pattern of injuries seen intra operatively is given in the table below.

Figure 1

Type Of Injury	Number	Percentage
Contusion	10	28.57
Laceration	13	37.14
Clean cut	5	14.28
Lateral tear	3	8.57
Spasm	2	5.71
Pseudo aneurysm	2	4.90

The surgical procedures carried out constituted end to end anastomosis in 13, lateral repair in 2, thromboembolectomy in 6, interspersional venous graft in 10, PTFE in 1, exploration and papaverine spray in 2 and fasciotomy in 6.

There were 26 complications. These included 8 superficial

infections, 6 compartment syndromes. Other complications included graft infection, bleeding, thrombosis and stiff knee. Repair failure occurred in 3 cases.

Of the 11 cases presenting within 6 hours 10 had successful limb survival. In other cases the survival rate of the limb was 83 percent.

There were 4 amputations and one death. 21 cases had good flow across the repair site while as 9 cases had a collateral compensation. The overall limb survival was 88 percent.

DISCUSSION

Wali et al acknowledged the role of acute clinical awareness in the diagnosis of arterial trauma. However they emphasised the role of non invasive investigations and the avoidance of delay.[4]

However, investigating vascular integrity can be time consuming and misleading[5] and, crucially, the sequence of the surgical approach to the skeletal, vascular and soft-tissue aspects of each injury remains unclear.

It is difficult to identify the vascular injury in those patients with no neurological or vascular deficits.[6]

In the absence of acute ischaemia, clinical presentations indicating arterial injury

include:

1. persistent or worsening pain, despite fracture reduction and stabilisation,
2. delayed onset of nerve palsy,
3. deepening of a nerve palsy inflicted at the time of injury, and
4. local swelling.[7]

The emphasis on clinical assessment is reproduced in the clinical series of Dennis et al and Frykberg et al.[8,9]. Our series also showed that clinical examination is reliable and can prevent time wastage.

The importance of time has been emphasised in the management of these injuries. However our province has problems that delay transport of these critically injured patients. In spite of a more than 6 hour delay occurring in nearly 68% of our patients we were able to achieve a reasonably good percentage of limb salvage. This probably

buttresses the fact that limb salvage should be attempted in case with delayed presentation also.

Infection was the commonest complaint that we witnessed. This occurred in 8 cases. This complication is not common in other series as reported by Wali et al.[4]

In spite of the complication rate the survival rate of the limbs in our series was 88%. This compares very favourably with the series of Bongard et al and Attebery et al.[10,11]

The results of the series show that repair of arterial injuries gives considerable benefits to patients even in the less developed areas of the world.

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