

An Experience with Vascular Trauma

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ABSTRACT

This prospective study was conducted at Jinnah Hospital, Lahore over a period of sixty months. Patients between the ages 18-32 years presenting with Vascular Trauma in A/E department were included in the study. Gender distribution was 36 males and 8 females. The vascular trauma was as follows: 5 radial arteries, 5 posterior tibial arteries, 14 femoral arteries, 7 popliteal arteries, 1 popliteal vein, 3 axillary artery, 5 brachial, 1 external iliac artery, 2 IVC and 1 Infrarenal aorta. All of these patients were managed surgically. The end results for all were patent vessels except 2(1 popliteal vein and 1 external iliac artery ligated) with functional limbs averting deaths and preventing life long disabilities thereby improving the quality of life and productivity as a human being.

Key words: Vascular trauma, Vascular repair

INTRODUCTION

Arterial surgery is one of the most technically demanding areas of surgery and is an unforgiving specialty – the immediate success or failure of a vascular intervention is usually apparent before the patient leaves the operation theatre. Good results are achieved by thorough planning, careful handling of tissues and the appropriate use of instruments, needles, sutures and grafts. Vascular injuries occur in many trauma cases and need to be identified and treated promptly preferably to prevent amputation of limbs or if that fails death. Penetration injuries usually occur by firearms and knives.

In U.K. the most common causes of vascular injury are blunt trauma and iatrogenic injury¹. The most common vascular injury is disruption of the vessel. Disruption may be partial or complete. Due to gearing up of crime rate, firearms and stab wounds are a routine. If a timely decision is taken and appropriate action instituted not only patient survives but lives a useful and meaningful life with functional limb. Speedy diagnostic workup and early revascularization yields favourable outcome in vast majority of patients requiring vascular repair² Injured arteries in the proximal upper and lower limbs require resection with interposition grafting where as those in the forearm or calf are usually ligated³. This technical expertise is available only in tertiary care centers with many patients referred from periphery with pressure bandages or ligated vessels. An awareness that time crucially affects outcome promotes hurry and leads to lapses in technique which may compromise survival of the limb⁴ in low Velocity injuries, however, distal pulses are often maintained throughout, and the

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possibility of vascular injury may erroneously be discounted⁵ vascular injuries of the extremities accounts for most instances of vascular trauma and they entail a risk of amputation about 10 – 20%⁶ the patient behaves in our setup after vascular repair and what are the success rates.

MATERIALS AND METHODS

This prospective study was carried out in time frame August 2001 to August 2006. The venue of study was Accident & Emergency Department Jinnah Hospital, Lahore. The patients were admitted through casualty department. The patients presenting with symptoms of vascular injuries were subjected to emergency aid, history taking, clinical examination and laboratory investigations. On the basis of history, clinical examination and x-rays treatment was planned in individual cases. All the patients were monitored for haemodynamic stability and most needed blood transfusions and I/V fluids. Rapid restoration of blood volume and control of haemorrhage are the primary goals of resuscitative measures⁷. The patients were taken to operating room as quickly as possible. In all patients flow sheets were maintained and all the relevant data recorded. The diagnosis of vascular disruption was primarily supported by clinical examination and x-rays were carried out to rule out fractures. Where indicated external fixator was applied.

RESULTS

The study included 42 patients out of whom 36 were males and 8 females. All the patients were admitted through Accident & Emergency department and operated. The relevant pulses were absent in all cases with bleeding from the trauma site except one which had blunt trauma. After surgery out of 44, 42 vessels remained patent and 2 were ligated. All

patients had functional limbs post operatively. Patency was documented by Doppler ultrasonography post operatively.

Table 1: Frequency distribution of patients with vascular trauma by gender.

Males	Females
36	8

Table 2: Outcome of surgery postoperatively (n=44)

Patent vessels	Non patent vessels	Functional limbs
44	1 popliteal vein ligated, 1 external iliac artery ligated	44

Table 3: Site of vascular injury

Radial artery	5
Posterior-tibial artery	5
Axillary artery	3
Femoral artery	14
Popliteal artery	7
Popliteal vein	1
Brachial artery	5
IVC	2
External iliac artery	1
AORTA	1

DISCUSSION

All the patients were young with mean age 25 years (18-32 years). They had no pre existing cardio pulmonary lesion or atherosclerosis. All had normal lipid profiles. Five posterior Tibial arteries, five radial arteries with mobilization of both arterial ends and subsequent end-to-end anastomosis with 6/0 proline round body interrupted sutures was done. Three axillary arteries, 14 femoral arteries, 7 popliteal arteries with reverse autogenous long saphenous vein grafts harvested from contra lateral thighs was the procedure of choice. One external iliac artery was ligated due to patients falling blood pressure with no arrangement of blood transfusion. This patient had a functional limb post operatively. Proximal control was achieved in all before, application of clamps to injury site.

One popliteal vein was ligated because the patient went into cardiac arrest on operating table due to excessive bleeding and late presentation. Free flow of blood was established with fogarty. All had subsequent fasciotomies. All were heparinized (5000 iv) per operative and then 1000 units/hour I/V for next 4 days. They were monitored with APTT. Fasciotomies though not routinely indicated for all vascular injury and are indicated especially or popliteal artery injury⁸. In this study all were backed

up by fasciotomy, which were later, closed or grafted. The procedure helped to reduce the incidence of reperfusion injury. The pressure measurements are not routinely done in our setup hence not knowing the critical pressure⁹ and the need for urgent fasciotomy. The overall amputation rate in all peripheral vascular injuries has been calculated to be 22.6%¹⁰.

CONCLUSION

The diagnosis of peripheral vascular trauma has undergone significant evolution in last two decades. A minority of patients with arterial trauma in western setup present with classic findings. Occult arterial injury diagnosis is more challenging. Many authors now recommend one selective use of arteriography or other diagnostic modalities based on the results of clinical examination and non-invasive pressure determinations¹³.

In trauma the mechanism was direct penetration in 90 cases and blunt injury in 20 cases¹⁴. Military vascular injuries frequently result from fragment wounds while civilian vascular injuries usually are caused by gunshot wounds. In our setup even in cases of blunt trauma with suspicion of vascular injury we have to rely on clinical examination and then on exploration.

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