OUTCOME OF POPLITEAL ARTERY INJURIES AND AWARENESS ABOUT PREVENTIVE MEASURES

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ABSTRACT

**BACKGROUND:** To study the various outcome of popliteal artery injury and primary awareness about the preventive measures of road traffic accidents. **METHODS:** Retrospective analysis of 30 cases of popliteal artery injury data taken from Department of General surgery, Madras Medical College & Government General Hospital, Chennai from March 2009 to February 2012. **RESULTS:** Blunt trauma to popliteal artery accounts for 70% of cases. Contusion of middle third of popliteal artery segment is the most common mechanism and site of injury with associated bony fracture accounts for 78% of cases. Popliteal artery repair was done in 18 cases, primary amputation was done 10 cases and 2 cases were managed medically. Great saphenous vein interposition was the commonest procedure done. **CONCLUSION:** Blunt injury due to RTA is more common than gunshot injury. Delayed presentation to tertiary care facilities and unawareness regarding outcome of injury lead on to higher amputation rate compared to developed countries. Primary preventive strategies of road safety measures and health awareness should be the main focus to reduce the amputation rate and better outcome.

**KEYWORDS:** Popliteal artery; Road Traffic Accident (RTA); Arterial repair; Primay amputation; Great saphenous vein (GSV).

INTRODUCTION:

Injury to the popliteal vessels has been recognized as the most limb-threatening of peripheral vascular injuries for as long as vascular trauma has been studied. The popliteal artery is a true end artery with a tenuous collateral blood supply. The popliteal vein provides the bulk of lower leg and foot drainage. This explains why injury to these vessels is so dangerous. Despite this, limb loss and limb morbidity following this trauma have been reduced to the same minimal levels as is reported for all other peripheral vascular injuries in some recent reports. The diagnostic and therapeutic factors that account for this accomplishment merit review from the perspective of the distinct history, anatomy, and epidemiology of popliteal vascular trauma. Reference the introduction!!!!

METHODS:

The study was being conducted after getting approval from the Institutional Ethical Committee of Madras Medical College & Government General Hospital, Chennai. Patients presented with popliteal artery injury will be examined thoroughly from head to foot and immediately followed with hand held Doppler and on table angiogram if situation warrants. After adequate resuscitation with intravenous fluids and blood and ruling out other major injuries like head injury, chest injury, abdominal injury and orthopedic injuries patient were taken for emergency surgery and followed up in the postoperative period

Table 1. Mechanism of Popliteal Artery Injury

<table>
<thead>
<tr>
<th>MECHANISM</th>
<th>NO. OF CASES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blunt (No Fracture / Dislocation)</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Open Fracture</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>Closed Fracture</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Dislocation</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2. Popliteal Artery Repair Done In 18 Cases

<table>
<thead>
<tr>
<th>Method</th>
<th>No. of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Suturing</td>
<td>2</td>
</tr>
<tr>
<td>Interposition Graft Vein</td>
<td></td>
</tr>
<tr>
<td>END TO SIDE Anastamosis</td>
<td>13</td>
</tr>
<tr>
<td>END TO END Anastamosis</td>
<td>3</td>
</tr>
</tbody>
</table>

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Table 3. Amputation Rate

<table>
<thead>
<tr>
<th>TYPES OF AMPUTATION</th>
<th>NO. OF CASES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>10</td>
<td>33.33</td>
</tr>
<tr>
<td>Delayed</td>
<td>3</td>
<td>16.66</td>
</tr>
</tbody>
</table>

All 3 cases who underwent delayed amputation presented after 12 hours of injury with contamination. One case is due to vascular blow out and another 2 cases were due to posterior compartment of leg muscles necrosis.

Bar chart I: MECHANISM OF INJURY

Bar chart II: ASSOCIATED INJURIES
RESULTS:

Blunt injury (Table 1) due to road traffic accidents accounts for 70% of the cases, and cases presented within 12 hrs had a good outcome, and middle third of the popliteal artery injury accounts for 72% of the cases. Contusion of the artery (Fig 1) is the most common finding accounts for 65% of the cases. Associated bony injuries (Fig 2) are fairly common (78%) especially both bone fractures of leg accounts for 40% of the cases and associated muscular injuries (Fig 3) and skin loss accounts for 64% of the cases. Sensory loss of the foot seen in 74% of the cases, whereas motor loss of the foot was seen in 36% of the cases. Two cases were being managed conservatively, after angiogram showing normal vasculature. Interposition of long saphenous vein graft (Table 2) is most commonly performed procedure in 88% of cases (Fig 4) and primary amputation rate and delayed amputation (Table 3) accounts for 33% and 16% of the cases respectively. Higher wound infection rate of cases presented later than 12 hrs of injury.

DISCUSSION:

Popliteal vascular injury although uncommon overall, the incidence varies widely by the mechanism (bar chart I) blunt trauma vs. penetrating gunshot), location (urban vs. rural) and settings (military vs. civilian). Similarly, outcomes such as limb salvage rates vary widely by centers with a significant percentage of penetrating trauma. Blunt popliteal artery injury due to RTA are more common in our series and is typically associated with significant transmission of force to the lower extremity that can result in associated (Bar chart II) severe soft tissue, muscle, and bone injury.
bony, nerve and vein injuries. The more extensive injury to the vessel and surrounding structures, complicate the
managements of blunt injury and likely explains the high amputation rates in our series. Particularly devastating and
multilevel vascular injuries and severe combined vascular and musculoskeletal trauma resulting in a mangled
extremity seen in some of our cases, similar to mullenes et al. Delayed presentation to tertiary care center is far more
common in our population and cases presented within 12 hrs had good outcome than those presented late. All cases
presented more than 16 hrs after injury underwent primary amputation because of ischemia. 3 cases were missed
with clinical examination by referring physician who refers the patient late underwent primary amputation.

Delayed amputation performed for 4 cases, one is due to vascular blow out and other 3 cases due to wound
infection post operatively. Out of 5 cases underwent on table angiogram, 2 cases were found to be having normal
popliteal artery so that further exploration deferred. Long saphenous vein interposition grafts only used in bypass
surgeries and most commonly performed anastomosis is end to end anastomosis (11 out of 18 cases) followed by
end to side anastomosis (4 out of 18 cases) followed by direct end to end anastomosis. Ligation of popliteal artery is
not done in any cases. Popliteal vein repair done in 10 cases and ligation in 2 cases due to uncontrolled hemorrhage.

Reference is essential aspect of any article. Reference your article!!!!

CONCLUSION:

Blunt injury due to RTA is more common in our population than gunshot injuries seen in western studies. Site of injury and type of injury are more or less common in all the studies which we compared. Associated bony injuries, especially both bones of leg fractures are more common than knee dislocation and femur fractured seen in most of the other studies. Associated muscular and skin loss is more common than other studies which explains higher amputation rate in our study. Pulse examination and Hand-Held Doppler examination are very reliable predictors of amputation. Long saphenous vein interposition grafts are more commonly used than synthetic grafts. Health Education programs should focus on trauma management and Health care providers should be trained for early diagnosis and early referral to higher centers. Road safety measures should be implemented properly. More persons should be trained for dealing vascular injuries and trauma management effectively. Facility of Tertiary centers should be periodically upgraded based on the need of the local requirements.

Figure 1: Contusion of the Artery is shown
Figure 2: Associated bony injuries is shown

Figure 3: Associated Muscular Injuries is shown

Figure 4: Interposition of long saphenous vein graft is shown
References:


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