Descriptive cohort study of Ligation of femoral artery in infected femoral pseudoanurysm in injectable drug abuser

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ABSTRACT

BACKGROUND
Infected femoral pseudoanurysm with impending rupture presents most of the time in the late stage in drug abuser with features of sepsis. These cases are managed immediately by exploration with ligation of femoral artery when bypass is not feasible in emergency.

METHODS
This is the retrospective descriptive study of 11 years of bir hospital. Datas were collected from the record and subsequent out patient department visits of the cases having femoral infected pseudoanurysm with impending rupture with sepsis of injectable drug abuser. The data collected were patients profile, type of procedure like ligation of femoral artery, bypass like reverse long saphenous graft and synthetic dacron or ptf graft and complications were also recorded with subsequent. The type of procedure were compared with amputation as final end point. Datas were analysed by spss softwear.

RESULTS
We recorded the datas of 45 patients with almost all were male with very few female having mean age of 27.91 years. Twenty two patients had seropositive status and 13 patients had negative. Thirty five patients had ligation of femoral artery,7 patients had interposition synthetic bypass graft and 3 patients had reversed long saphenous vein graft. Nine patients had undergone revision after graft failure as ligation. No complication in 20 cases .Nine cases had rethrombosis with infection, 7 had minor complication and 1 had severe claudication.

CONCLUSIONS
In emergency setting, simple ligation of the femoral artery can be both life and limb saving procedure in difficult situation like infection and sepsis.

KEYWORDS
Ligation, Pseudoanurysm, Sepsis.
METHODS
This is the retrospective descriptive study made from 2006 to 2017 in national academy of medical sciences bir hospital kathmandu Nepal under the department of cardiothoracic and vascular surgery (CTVS). After obtaining ethical approval from the Institutional Review Committee, data was collected from the record section of all the infected pseudoanurysm cases of self-injection of abused drugs through inguinal region into the femoral artery presented in the emergency in the state of impending rupture and subsequently managed as emergency basis. We excluded the other form of pseudoanurysm where the cause of pseudoanurysm is other than the IV drug abuse. Non infected and non-emergency, that is, where no feature of impending rupture like leaking and skin changes at the aneurysm site.

Considering a total of 3 patients per year as an average cases operated as an emergency basis in Bir hospital in the department of cardiothoracic and vascular surgery, and the definite prevalence is not available, we took as an average of 33 patients in 11 years, taking as 95 % confidence interval a total of 45 IV drug users were selected as total sample size.

The data collected were patients profile, infective features like fever, rigors, groin swelling with pain and flexion of the involved limb, leukocytosis. Diagnosis was confirmed by Doppler scan with yin-ying sign with leaking from the aneurysm (impending rupture) were taken to the CTVS operation theatre as an emergency procedure where in early years, revascularization were done by using synthetic graft of size 8 mm of internal diameter (dacron or eptfe) or reverse long saphenous graft on the basis of availability. Some of these cases were again represented with blockage of graft with the history of repeated injection into the graft as an IV drug abuser and these patients presented late where we observed no features of limb compromised by occlusion of the graft and we removed the graft and ligate the femoral vessel across the proximal anastomotic site. Then in subsequent cases, all had undergone ligation both proximally and distally around the origin of the pseudoanurysm. Aneurysm sac was excised with debridement only after controlling the femoral vessel by Doppler scan with yin-ying sign with leaking from the lesion of impending rupture of the infected femoral pseudoanurysm. We have major concern about the management of such kind of cases.

RESULT
45 patients were included having 42 (93.33%) were male and 3 (6.67%) were female and the age ranges from 17 years to 41 years of age with mean age of 27.91 years having standard deviation of 6.28 years. All 45 patients had infected pseudoanurysm in femoral region having 22 (48.9%) patients got seropositive status and 23 (51.1%) patients had negative status. (chi square = .002). In treatment part 35 (77.8%) patients had ligation of pseudoanurysm, 7 (15.6%) patients had undergone interposition synthetic bypass graft and 3 (6.7%) patients had interposition reversed long saphenous vein graft. Almost all the grafted 9 (20%) in total 45 patients but it is 90% out of 10 revascularization procedure patients undergone revision after thrombosis with infection by repeated injection by the injectable illegal drug. In total 9+35=44 (97.77%) had undergone ligation of the involved vessel only 1 (2.22%) patient had revascularization ultimately. There were no complication in 28 (62.2%) cases. 9 (20%) cases had rethrombosis with infection,7 (15.6%) had minor complication and 1 (2.2%) had severe claudication.

DISCUSSION
We have major concern about the management of impending rupture of the infected femoral pseudoanurysm. Many of the patients presented with leaking from the lesion in which patients were directly taken to the operation theater and managed. The outcome of the management are concerned with the viability of the concerned limb as the final end point. In Nepal major concerned is the injectable drug abuser mostly presented with swelling and pain and features of infection, falsely diagnosed with inguinal abscess and landing into catastrophe by doing incision and drainage. In the study from Morang district of Nepal, we found mainly males (97.8%) and very few females, having majority (62.7 %) from the age group 21-30 years.2 Cases of infected pseudoanurysm having similar demographic profile releated to our study in which data of 14 consecutive patients were analyzed having 85.7% were male. The median age was 27 years (range, 19-42 years).3 In one study, it was found that only male young population was involved.4

About 50% of the patients were seropositive (HIV/hepatitis B, Hepatitis C) which is because of needle sharing. Infection rates of (10.34%) for hepatitis B virus, (17.24%) for hepatitis C virus and (3.45%) for human immunodeficiency virus were found in literature.5 Many patients were managed as emergency procedure in which some of the patients were managed wrongly as inguinal abscess, for which also were
treated by our department. In early periods we managed by bypassing the involved part going through non infected route to prevent graft infection by using either reversed long saphenous vein graft or synthetic graft like dacron/ eptfe depending on the availability. In the early period we were very much reluctant to go for ligation only but during subsequent period of follow up, nearly all 90% previously bypass grafted patients came with complication of the graft mainly infection with thrombotic occlusion due to the repeated puncture of the graft as a abuse of drugs. out of 10 patients 9 (90%) patients had undergone revision with ligation, doing in the sense that these patients had viable limbs even though they had occluded graft for quite long time before they present as repeated infection with graft occlusion confirmed by either CT angio or arterial duplex scan. In one of the study, revascularization developed acute complications in 12 patients, requiring 3 amputations and 13 secondary arterial operations in addition to debridements and skin grafts. In contrast, no amputations were required in six patients who underwent primary arterial ligation and debridement. In the median period we routinely managed cases by simple ligation of the vessels both proximally and distally across the site of origin of the pseudoaneurysm. Around 88% of the cases had operated primarily by ligation only with debridement of the infected part keeping the debrided part open allowing for secondary healing. In total 97.77% of patients ultimately treated with ligation only. In one of the study, total of all 134 drug addicts had their femoral arteries ligated with all the limbs preserved. In this study 62.2% patients did not develop any complication. In other similar study 26 patients undergoing femoral artery ligation, angiography at 1 week after operation showed abundant collateral circulation from ipsilateral internal iliac artery, superior gluteal artery or contralateral internal iliac artery. Three cases had postoperative intermittent claudication which was improved after symptomatic treatment. So the limbs are viable because of collaterals supplying the distal aspects.

Few patients, 15.6% developed minor claudication which were treated conservatively as mention previously. In one other study, (23%) patients developed intermittent claudication out of 16 patients which has similarity with this study. 2.2% patient had severe claudication but lost follow up while arranging revascularization. Unfortunately we did not have any patients of limb gangrene developed after ligation of the major involved vessels. Author reported in review article that recent surgical therapeutic reports favour aneurysm ligation and excision and local debridement with observation-selective revascularization in cases where limb viability is threatened, or ligation with debridement alone without vascular reconstruction. Literature has mentioned gangrene rate between 0 to 12.5%.

**CONCLUSION**

Ligation with debridement allowing delayed secondary healing can be the surgical management of choice for infected femoral pseudoaneurysm provided that strict post-operative monitoring of the vascular perfusion. If patients develop compromise landing to gangrene needs revascularization of the limb.

**Table 1: Procedures and complications**

<table>
<thead>
<tr>
<th>Surgical procedure</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Interposition bypass synthetic graft</td>
<td>7</td>
<td>15.6</td>
</tr>
<tr>
<td>Ligation of both proximal and distal portion of pseudoaneurysm</td>
<td>35</td>
<td>77.8</td>
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<tr>
<td>Interposition reversed long saphenous vein graft</td>
<td>3</td>
<td>6.7</td>
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<table>
<thead>
<tr>
<th>Complication of surgical procedure</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No complication</td>
<td>28</td>
<td>62.2</td>
</tr>
<tr>
<td>Graft failure by repeated IV drug with ligation of femoral artery.</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Minor claudication</td>
<td>7</td>
<td>15.6</td>
</tr>
<tr>
<td>Severe claudication</td>
<td>1</td>
<td>2.2</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Serological study (HIV, HBsAg, HCV)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>22</td>
<td>48.9</td>
</tr>
<tr>
<td>Negative</td>
<td>23</td>
<td>51.1</td>
</tr>
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**Sex of the patient**

Fig 1 - Sex distribution
REFERENCES


