

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

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ABSTRACT

BACKGROUND

Infected femoral pseudoaneurysm 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 pseudoaneurysm 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 ptfе 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, Pseudoaneurysm, Sepsis.

BACKGROUND

Femoral pseudoaneurysm is defined as irreversible dilation of an artery due to damage of arterial wall where true wall of the artery is absent. The most common conditions are iatrogenic during angiographic procedure, intra-arterial drug abusers and other penetrating trauma. Most of the time intra-arterial drug abuser presented with infected impending rupture of femoral pseudoaneurysm as these group shares needles and do not maintain aseptic condition and punctured repeatedly and presents most of the time in the late stage with features of sepsis. Immediate surgical intervention like revascularization using synthetic or autogenous vein grafts used either intra- or extra-anatomically but it takes extensive period jeopardizing the patient's condition relative to simple ligation with debridement when bypass is not feasible, are the mainstay

of treatment to reduce the associated high morbidity and mortality. The rationale behind to use the simple ligation in this study is whether the limb can be saved or not, to reduce the systemic complication related prolonged procedure and non-availability of synthetic graft and expertise in that setting. This simple ligation procedure do not need expertise as can be easily performed by general surgeon to save the life of the patient in rural places. One of the survey report from the ministry of home and affairs showed that in Nepal among the total drug users, 57% (52,174) are IV user and among them 13% shared needles with someone else.¹

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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 were collected from the record section of all the infected pseudoaneurysm 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 pseudoaneurysm where the cause of pseudoaneurysm 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 pseudoaneurysm. Aneurysm sac was excised with debridement only after controlling the femoral vessel through supra inguinal incision retroperitoneally. We kept the debrided wound open for secondary healing. Then the patient were shifted to the post up CTVS icu where limbs were observed for compromise as gangrene. After 2- 3 days if no complication, patient were shifted to the CTVS ward where we looked for any complication like gangrene with regular dressing. The type of procedure were compared with amputation as final end point. After discharging, we kept them for follow up for 1 year. During follow up we asked for the complication like mild claudication as a distance of walking more than 500m and severe claudication as a

distance of walking less than 50m as a rough guide. The serological status were recorded. The data were analysed with spss 22 version by descriptive and frequency analysis.

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 pseudoaneurysm 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 pseudoaneurysm, 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 pseudoaneurysm. 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 concern 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 pseudoaneurysm having similar demographic profile related 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/epitfe 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.⁶ In the median period we routinely managed cases by simple ligation of the vessels both proximally and distally across the site of origin of opening 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.⁷ 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.⁸ 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.⁹ 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.⁷ 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.¹⁰ 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.

Table1 Procedures and complications

Surgical procedure	Frequency	Percent
Interposition bypass synthetic graft	7	15.6
Ligation of both proximal and distal portion of pseudoaneurysm	35	77.8
Interposition reversed long saphenous vein graft	3	6.7
Complication of surgical procedure	Frequency	Percent
No complication	28	62.2
Graft failure by repeated IV drug with ligation of femoral artery.	9	20
Minor claudication	7	15.6
Severe claudication	1	2.2
Serological study (HIV, HBsAg, HCV)	Frequency	Percent
Positive	22	48.9
Negative	23	51.1

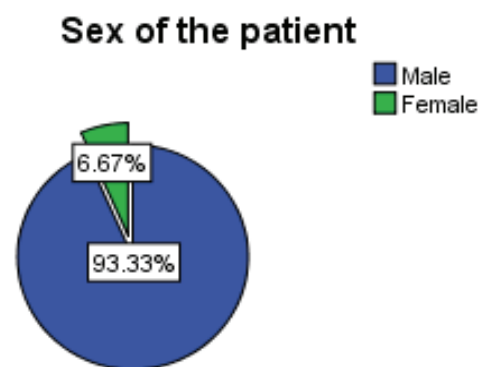


Fig 1 - Sex distribution

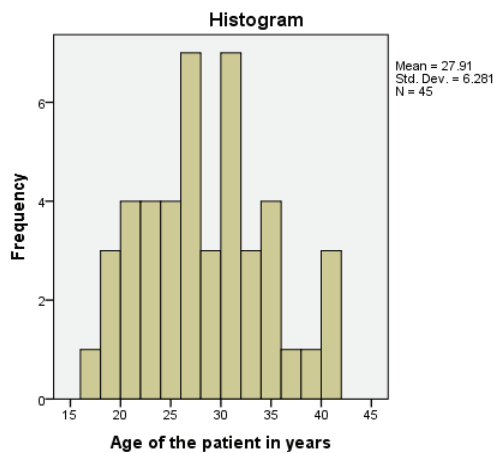


Fig 2 – Age distribution

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