

OPTIMAL PRIMARY SURGICAL MANAGEMENT OF INFECTED PSEUDOANEURYSM IN INTRAVENOUS DRUG ABUSERS: LIGATION OR RECONSTRUCTION?

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ABSTRACT

Objective: To find out the optimal primary surgical treatment options for infected pseudoaneurysm in intravenous drug abusers.

Study Design: Cross sectional descriptive study.

Place and Duration of Study: Department of Vascular Surgery, Combined Military Hospital Lahore, from Jan 2010 to Jun 2015.

Material and Methods: A total of 31 consecutive patients with a history of intravenous drug abuse and an infected pseudoaneurysm in the groin or elbow, presenting in emergency department; were included in this study. All patients were primarily treated with ligation of the artery, excision of infected pseudoaneurysm and debridement of necrotic tissues. Only one patient underwent additional revascularization procedure.

Results: All patients who underwent ligation and excision procedures did well initially. One (3.2%) patient developed severe distal ischemia after ligation of femoral artery within first 24 hours, so extra anatomic revascularization procedure was performed. Five (16.1%) patients required revascularization procedure after 16 weeks due to disabling distal ischemia. No amputation was needed and mortality rate was zero.

Conclusion: Primary ligation of the artery with excision of infected pseudoaneurysm and necrotic material was found the optimal initial management for infected pseudoaneurysm in intravenous drug addicts. Ischemic complications if develop should be treated with early or late revascularization.

Keywords: Excision, Intravenous drugs, Ligation, Pseudoaneurysm, Revascularization.

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INTRODUCTION

The problem of intravenous (IV) drug abuse is progressively increasing in both developed as well as underdeveloped countries and is associated with increase in incidence of vascular complications. Infected pseudoaneurysm of femoral artery is one of commonest vascular complication in IV drug addicts. If not treated promptly, this is not only a limb threatening but also a life threatening condition¹. Traditional treatment is ligation of artery, excision of infected pseudoaneurysm and surgical debridement of necrotic tissues². But disabling claudication and amputation may result later on due to ischemia³. To avoid these complications, some surgeons practice revascularization as a routine primary procedure⁴. Prosthetic or autogenous venous

grafts can be used⁵. Veins are usually not available in such patients due to deep and superficial vein thrombosis⁶. We preferred ligation and excision as primary procedures in our study and performed revascularization procedure only when patient had ischemic complications and the area was clean.

PATIENTS AND METHODS

A total of 31 patients diagnosed with infected pseudoaneurysm were included in this cross sectional descriptive study by non-probability consecutive sampling. This cross sectional study was carried out in the vascular surgery department of combined military hospital Lahore from January 2010 to June 2015. Patients who refused admission and those who denied surgical treatment were excluded.

The data was collected from vascular surgery department and operation theatre of combined military hospital Lahore. Patient's

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Received: 13 Oct 2015; revised received: 08 Dec 2015; accepted: 09 Mar 2016

demographic variables were recorded including age, sex, underlying risk factors for vascular disease like diabetes mellitus, hypertension, smoking etc. The diagnosis was made on basis of history of IV addiction and clinical features.

All the patients were admitted and started on broad spectrum intravenous antibiotics. All the patients underwent baseline laboratory tests including complete blood count, hepatic renal and coagulation profiles, blood grouping and screening for hepatitis B and C. Only in haemodynamically stable cases, a duplex scan was performed to confirm pseudoaneurysm.

All patients underwent ligation of the involved artery (brachial or femoral) both proximal and distal to pseudoaneurysm, excision of infected pseudoaneurysm and thorough debridement of necrotic tissues in the vicinity. The wound was left open to granulate and heal by secondary intention. Primary revascularization was not performed as a routine in our patients.

Collected data were analysed using statistical package for social sciences SPSS version 20. The numerical outcomes i.e. age and duration of follow up were presented as mean and standard deviation. Qualitative variable i.e. patient's sex were recorded as frequency and percentage.

RESULTS

Thirty one patients with infected pseudoaneurysm were included in the study. There were 29 (93.5%) males and 2 (6.5%) females. The minimum age of patients was 17 years and maximum age was 36 years, with mean age of 25 (SD \pm 2.9) years. The history of IV drug abuse varied between 1 to 9 years with a mean of 4 (SD \pm 3.1) years. Five (16%) patients belong to medical profession and of these, one was a young doctor. None of the patients had any underlying comorbidities like diabetes mellitus or hypertension. There were 9 (29%) patients who have been smoking for more than 3 years.

Twenty nine (93.5%) patients had infected pseudoaneurysm of common femoral artery and only 2 (6.5%) had infected pseudoaneurysm of brachial artery. Of the 29 patients with lower limb involvement, 24 (82.7%) patients had infected pseudoaneurysm in right groin while 5 (17.2%) had it on the left side. Both the upper limb aneurysms were of the brachial artery in left cubital fossa.

Fifteen (48.3%) patients reported to us in emergency in a collapsed state due to ruptured infected pseudoaneurysm while 16 (51.6%) had relatively stable aneurysm with history of pus discharge or mild bleeding off and on from a pulsatile infected swelling in the groin. All these stable patients underwent a duplex scan to confirm the diagnosis. After the primary surgery, all patients were discharged with a monthly follow up for a minimum of 6 months and then yearly follow up. The average follow up was from 3 months to 3 years with a mean of 10 months.

Only one patient (3.2%) developed signs of severe distal limb ischemia within 6 hours of ligation of femoral artery. He underwent revascularization procedure using a prosthetic extra anatomical graft. Five (16.1%) patients developed disabling claudication within 4 months of arterial ligation and had revascularization procedure with a prosthetic graft. There was no mortality in our patients and amputation rate was zero.

DISCUSSION

The frequency of vascular complications is increasing due to increase in number of intravenous drug abusers. Infected pseudoaneurysm in IV drug abusers is a potentially lethal complication which may prove limb or even life threatening⁶. It results usually from an accidental or intentional arterial puncture leading to haemorrhage and an infected haematoma due to use of unsterile methods of IV access. This infected haematoma causes rupture of arterial wall and formation of an infected pseudoaneurysm⁷.

Clinically patients present with pus, bleeding and or a pulsatile mass as described by Feldman and Berguer⁸. If these features are ignored, massive haemorrhage can occur from rupture. Gan et al reported that one third of his patients with infected pseudoaneurysm presented as an emergency with a ruptured aneurysm⁹. In another study, Behera et al reported 70% patients presenting with rupture of pseudoaneurysm¹⁰. In our study, 40% patients reported with ruptured pseudoaneurysm.

Diagnosis is made on clinical grounds but can be confirmed by duplex scan in haemodynamically stable patients¹¹. We confirmed our diagnosis of pseudoaneurysm in 16 patients with duplex scan.

Optimal primary treatment for infected pseudoaneurysm in IV drug addicts is still controversial as the studies conducted in this regard have a very small number of patients¹². The treatment options include ligation of the artery and excision of infected pseudoaneurysm plus necrotic tissues in the vicinity without primary revascularization or ligation, excision and routine primary revascularization^{9,13}. Revascularization requires arterial continuity with autologous vein or prosthetic graft. Vein usually is unavailable in these patients due to deep and superficial venous thrombosis. Presence of infection in the area demands the use extra anatomical site for revascularization⁴⁻⁶.

Gan et al ligated the involved artery excised pseudoaneurysm and dead tissues in 34 patients and found 33 had viable limbs in early postoperative period⁹. Only four patients required late revascularization. Ting et al again had similar experience of ligating the involved artery in 33 patients and found all of them had viable limbs but after 15.5 months 29 patients had claudication¹⁴. Padberg et al concluded in his study that ligation of the involved artery alone is preferable over routine revascularization procedure as a primary treatment¹³. We practice ligation of artery along with excision of dead tissue and pseudoaneurysm as a primary

treatment and revascularization (early or delayed) was reserved only for patients who developed limb ischemia. These results are comparable to the international studies.

CONCLUSION

Ligation of the involved artery in infected pseudoaneurysm with excision of necrotic material is the optimal treatment in IV drug abusers as a first step as it is both safe and effective. Revascularization procedure is performed only when there is disabling claudication or viability of the limb is threatened. However, further studies with large number of patients are required to formulate guidelines to both strategize and optimize treatment for infected pseudoaneurysm in IV drug abusers.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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