

# Arterial Ligation for Infected Femoral Pseudo-Aneurysm in Drug Injecting Abusers

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**Abstract-** Pseudo-aneurysm of the femoral artery is the most common arterial complication in drug injecting abusers. Scholars in vascular surgery have published debating statements regarding techniques of successful surgical management during last two decades. We present the results of simple arterial ligation in a series of 32 patients presenting with infected femoral pseudo-aneurysm. Most of the patients were males (89%). Young persons in the age group of 15-44 years were mostly affected. Site of lesion included common femoral artery in 65% , superficial femoral artery 28% and at bifurcation 6.2%. cellulitis in 14 (53%), abscess & cellulitis in 6 (19%), necrotizing fasciitis in 2 (6.2%) and vascular abscess in 7 (22%) cases were the forms of associated local infection. There was no hemorrhage, vascular thrombosis, amputation, or mortality. Claudicating were the only complications identified in 2 patients with Tripe ligation. Ligation is the optimal management for infected pseudo-aneurysms because it is easy, cost-effective, and safe. Early reconstruction is not recommended, since there is an extended infection in the location of the pseudo-aneurysm.

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**Key words:** Infected femoral pseudo-aneurysm, arterial ligation, intravenous drug abusers

## Introduction

Pseudo-aneurysm of the femoral artery is the most common arterial complication in drug injecting abusers. The classic management of false aneurysms is resection of the involved artery and reconstruction such as interposition, bypass graft or patch graft repair (1-6). But, simple ligation and surgical reconstruction are the two different and mostly used techniques to manage the infected false aneurysm of femoral artery in intravenous drug abusers.

Scholars in vascular surgery have published debating statements regarding techniques of successful surgical management during last decade. With the advent of this century encouraging results have been reported by various authors (5-8). Following the path of pioneers and successful results of previous works we used simple arterial ligation for such cases in our vascular surgery unit. Purpose of this prospective study is to present the results of simple arterial ligation in a series of 32 pa-

tients presenting with infected femoral pseudo aneurysm.

## Patients and Methods

In this prospective study 32 intravenous drug abusers presenting with infected femoral pseudo aneurysms were evaluated from 1997 through 2006. All patients received systemic parenteral antibiotics pre and post operation as well as oral antibiotics afterward administered for two weeks. All of 32 operations were simple arterial- ligation. Daily dressing of open wounds and checking for ischemic signs on the limbs were carried out. At the time of discharge, there was no patient with gangrene of the limbs. A case record of demography and variables including clinical features operation notes, complications, and six months and yearly follow up notes were maintained for each of the patients. Data of variables were extracted from case records, and analyzed according to standard Health system research methodology.

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**Results**

Experience with 32 arterial operations for the treatment of femoral infected pseudo aneurysms has been described. Most of the patients were males (89%) (Table 1). Young persons were mostly affected Age group of patients has been illustrated in table 2. Site of lesion included Common femoral in 65%, superficial femoral 28% and at bifurcation 6.2% (Table 3). Cellulitis in 14 (53%), abscess & cellulitis in 6 (19%), necrosing fasciitis in 2 (6.2%) and vascular abscess in 7 (22%) (Table 4) cases were the associated forms of local infection. There were hemorrhage, cases acute ischemia, amputation, or mortality. Claudicating were the only complications identified in 2 patients with Triple ligation (Table 5).

**Table 1.** Gender incidence

Gender	n	Incidence
male	29	89.3%
female	3	10.6%
Total	32	100%

**Table 2.** Age incidence

Age group	n	%
15-44yr	26	81%
45-64yr	5	15%
65-74yr	1	3%
Total	32	100%

**Table 3.** Site of Lesion

Site	n	Incidence
Common Femoral	21	65%
Superficial	9	28%
Bifurcation	2	6.2%

**Table 4.** Associated Infection

	n	%
Cellulitis	14	53%
Abscess & Cellulitis	6	19%
Necrosing fasciitis	2	6.2%
Vascular abscess	7	22%
Total	32	100%

**Table 5.** Complications

	n	%
Bleeding	4	12.5%
Claudication	2	6.2%
Amputation	3	10%
Mortality	-	0%
Vascular abscess	2	6.2%

**Discussion**

Approximately 75% of all admissions for accidental intra-arterial drug injections involve the lower limb; hence, the most common site of infected pseudo aneurysm is the inguinal region (3, 7-9), as we found in the results of present study. If left untreated, the infected pseudo-aneurysm may be accompanied by systemic sepsis, life threatening hemorrhage, loss of limb, or even death. In our recent study on the epidemiology, 54% of vascular lesions in drug abusers were arterial pseudo-aneurysm, vascular abscess and necrotizing fasciitis comprised of 4% and 6% cases respectively. Simple arterial ligation and resection of the infected tissue was applied for all the cases pseudo aneurysm in this series. (10).

The debate regarding reconstruction is of particular interest in the subset of patients with infected pseudo-aneurysm of the femoral bifurcation, which is the result of IV drug abuse (6).

Usually the reconstruction is to require prosthetic material, which may result in re-infection and could be more complicated and dangerous (1-2). Thereby, from that point of view, most of the authors have advocated simple arterial ligation and resection of the infected tissues (2, 6-11).

However, the amputation rate after simple ligation is 33% when the femoral bifurcation is involved (7,4). In a study by Arora *et al.* (5) they performed a simple arterial ligation for all patients. There was no amputation after the operation and the only complication was mild claudicating after 18 months. There was claudicating in only 2 of 32 patients in the present series. These were the cases of triple ligation. Reddy *et al.* (9) carried out arterial ligation on 39 patients. They reported two (5%) amputations, Performed on patients who did not have appropriate collateral blood circulation because of A previous common femoral artery ligation. McElroy *et al.* (12) conducted a study on 60 intravenous drug abusers. Twelve cases underwent reconstruction surgery and the others (48 patients) underwent ligation. In comparison with ligation, reconstruction surgery had more post-

operative complications (50% rejection of the graft and 17% amputation above the knee vs. 8% amputation after ligation). They recommended that in all cases, surgical treatment should include ligation of the aneurysm, debridement of necrotic tissue, and packing of the open wound to allow healing by secondary intention. We noticed their recommendation and followed their technique, leading to encouraging results. Johnson et al (13) in a study on 38 patients preferred the ligation operation for the management of infected femoral pseudo aneurysms. In a study carried out by Cheng *et al.* (8) no significant difference in the amputation rate between ligation and delayed reconstruction operations (in cases of acute ischemia) and early reconstruction was observed. Therefore, they selected the ligation procedure as the safer method.

On the other hand, al-Zahrani *et al.* (14) recommended early reconstruction of all major vessels, whenever possible, based on the current advances both in the antibiotic industry and in vascular surgery. Consequently, they believed that reconstruction was the best way to save patient's organs. However, long-term prognosis, in their experience, was poor and unpredictable. Reconstruction of vessels to manage an infected pseudo aneurysm is recommended by Kaiser *et al.* (15) and Levi *et al.* (16) because of the lower rate of postoperative claudicating. These two studies comprised a low number of patients (two and eight, respectively).

The most recent work has suggested that the best management of all infected pseudo-aneurysms is the ligation of the artery (17). All patients in Tehran series who underwent ligation surgery had healthy limbs at the time of discharge. After ligation, seven patients showed signs of claudicating, which is more acceptable than complications such as amputation and gangrene, resulting from reconstruction.

Naqi & Khan *et al.* from Mayo Hospital, Lahore, Pakistan have published a series of Seventeen patients who presented with a femoral pseudo aneurysm during a 1 year period. Sixteen of their patients (94%) had excision of the pseudo aneurysm with ligation of vessel and debridement without any revascularization (18). A similar Indian experience by Behara et al also suggest that Ligation and excision of pseudo aneurysms without revascularization is safe for drug addicts (19). In conclusion, ligation is the optimal management for infected pseudo aneurysms because it is easy, cost-effective, and safe. Early reconstruction is not recommended, since there is an extended infection in the location of the pseudo aneurysm. Moreover, infection of the artificial graft is also not uncommon.

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