

# A 3 year Audit of Infected Pseudoaneurysms in Intravenous Drug Users Managed Surgically in the Vascular Unit, Hospital Kuala Lumpur

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## Summary

This is a study of 54 intravenous drug user's (IVDUs) with infected pseudoaneurysms undergoing ligation and debridement at the Vascular Unit, Hospital Kuala Lumpur (HKL) from February 1993 to February 1996. The median age was 37 years with a male preponderance (53:1). Chinese form the largest ethnic group with 57.4% of the cases. Staphylococcus aureus was the most common organism cultured. Human immunodeficiency virus (HIV) positive cases numbered 21 (38.9%). Four of the patients had to have an above-knee amputation after surgery. Simple ligation and debridement of all necrotic tissue is an acceptable mode of therapy in these patients with low amputation rates.

**Key Words:** Intravenous drug abusers, Pseudoaneurysm, HIV

## Introduction

The use of illicit drugs by addicts via the intravenous route results in many complications, which require the attention of the vascular surgeon. As there is no needle exchange programme in this country, intravenous drug users resort to non-sterile and contaminated needles. This problem is further compounded by the sharing of needles by the addicts. The drugs taken are usually adulterated with other contaminants. This together with the unhygienic method of preparation of drugs leads to multiple vascular problems which include vein thrombosis, infected pseudoaneurysms and also in some cases gangrene of limbs. In addition to local complications, the sharing of needles leads to the spread of viral infections like Hepatitis B and HIV. IVDUs are one of the largest group of individuals at risk of HIV infection and also its dissemination. The objective of this audit was to obtain biodata, rate of HIV infection,

common bacterial pathogens and outcome after surgery on IVDUs admitted with a diagnosis of infected pseudoaneurysm.

## Methods

All IVDUs admitted to the Vascular Unit, HKL with a diagnosis of infected pseudoaneurysms between February 1993 to February 1996 and had surgery as obtained from operating theater (OT) registry had their records traced and data documented in a prepared form. Patients who were admitted but did not undergo surgery or died of a rupture of aneurysm or of sepsis while awaiting surgery were not included in the audit. All patients underwent ligation of the artery proximal to the pseudoaneurysm with debridement of all surrounding necrotic tissue. As a unit policy revascularisation of the involved limb is not carried out at the

initial surgery. All patients are given parenteral antibiotics on admission. The wound is not closed primarily but allowed to granulate with daily antiseptic dressing.

**Results**

There were a total of 57 operations done on 56 patients. One IVDU had ligation twice on different limbs. Only 54 records could be traced and this audit is based on these. The majority of our patients are in the younger age group with 85.2% younger than 45 years old (Fig 1). It is almost exclusively a problem in males. There was only one female (Table I). Chinese patients form the largest ethnic group treated followed by Malays. Table I demonstrates the different patient characteristics.

The groin was the most common site with 51 cases (92.7%) with both right and left sites being nearly equal involved (26 vs 25). The most common organism, Staphylococcus aureus was cultured in 21 cases (38.9%). Gram negative organisms were cultured in 5 cases (9.3%), polymicrobial growth obtained in 6 cases

(11.1%) and no growth in 4 cases (7.3%). No microbiological culture of the clot were done in 19 cases (33.4%). Twenty-one patients were HIV positive (38.9%), thirty were negative (55.5%) and in three (5.5%) the results were not available.

All patients underwent ligation and debridement. Four patients (7.3%) required amputation, two of whom had non-viable limbs on admission. There were 2 deaths post-op secondary to complications of hypovolemic shock and sepsis. The rest of the patients were transferred to peripheral hospitals or discharged to clinics for further wound care. These patients had viable limbs but varying degrees of disability. Assessment for long term complications was however not possible as most patients defaulted follow-up.

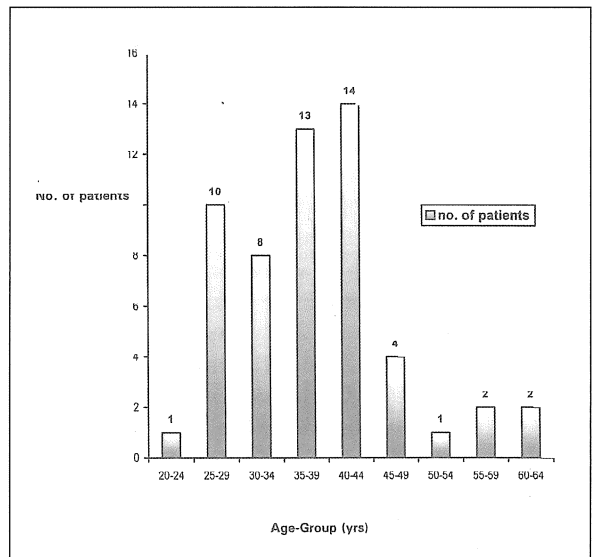
**Discussion**

A pseudoaneurysm forms due to the inadvertent injection of an artery with contaminated needles containing adulterated non sterile drugs, and failure to apply direct pressure on the injection site. Ongoing

**Table I**  
**Biodata of IVDUs admitted with infected pseudoaneurysms to the Vascular Unit, HKL between February 1993 to February 1996**

Age :	Median :	37 years
	Range :	24 to 60 years
	IQR :	30 to 43 years
Sex :	Male :	53
	Female :	1
Race :	Chinese :	31 (57.4%)
	Malay :	19 (35.2%)
	Indian :	3 (5.6%)
	Others :	1 (1.8%)

IQR: 25<sup>th</sup> to 75<sup>th</sup> percentile



**Fig. 1 : Age Distribution of IVDUs admitted to the Vascular Unit, HKL between February 1993 to February 1996**

infection continues the destruction of the artery, as well as the surrounding neurovascular structures.

The most common site of a pseudoaneurysm is in the groin followed by the axilla or medial aspect of the arm. Patients usually present with a pulsatile mass and with concomitant cellulitis/sepsis and give a clinical impression of having an abscess. An incision and drainage of such an 'abscess' however would result in torrential haemorrhage. As such it would be prudent advice to treat all swellings around major vessels in IVDUs as pseudoaneurysms until proven otherwise. If surgery is attempted, proximal arterial control must be obtained prior to incision of the mass. Arteriography has been done in some cases for diagnosis. However this is not done in our unit due to logistics as well as cost. Most cases in this study were diagnosed clinically. Recently the use of colour duplex ultrasonography is increasingly being used to diagnose pseudoaneurysms. This modality has the advantage of being non-invasive and quick. There is also no danger of medical staff coming in contact with the patient's blood or body fluids.

The aims of management of pseudoaneurysms are to prevent and control exsanguinating haemorrhage, control of sepsis with debridement of all infected and necrotic tissue, prevention of the spread of HIV and viral hepatitis infection to medical staff and wound care with daily antiseptic dressing post surgery. The role of routine revascularisation is controversial.

The initial control of haemorrhage requires the ligation of the proximal vessel which is usually the common femoral or external iliac artery for groin lesions and axillary artery for lesions in the arm. Ligation of vessels distal to the aneurysm is usually required as backbleeding can be torrential. This will invariably lead to ischaemia of the affected limb. Amputation rates as high as 20% have been observed when simple ligation of arteries is done and for this reason some authors advocate routine revascularisation using prosthetic material via an extra-anatomical route<sup>1,2,3</sup> but some have encountered a high graft complication rate, namely haemorrhage, thrombosis and sepsis. These complications requiring further surgical intervention.<sup>2,4,5</sup> Others have however advocated a simple excision and ligation policy<sup>5,6</sup> and others selective revascularisation when

indicated<sup>7,8</sup>. Authors advocating ligation alone did not have a higher amputation rate compared to those with a selective policy. In our unit a simple excision and ligation policy is done and we have found that our limb loss rate is only 7.3% (4 patients), and of which 2 patients had irreversible limb ischaemia before ligation. The high rate of graft complications is another reason for not doing revascularisation in our unit. Venous thrombosis and femoral nerve damage contribute to further limb disability.

Staphylococcus aureus was the most common organism isolated in our patients, as in other series<sup>1,2,6,7,9</sup>. Therefore it is our policy that all patients admitted would be given an anti-staphylococcus antibiotic, usually cloxacillin. Gentamycin is added if a Gram negative organism is isolated as was the case in 9.3% of patients.

A large number of our patients (38.9%) were HIV positive. As such universal precautions are taken for all cases during surgery and wound care. This adds to the cost and stress in managing these patients.

All of our patients have some degree of ischaemia post-ligation as measured by recording the ankle systolic blood pressures. However many are able to ambulate with crutches during the early phase of recovery. The long term effect of their disability is however not known as many are from outside the Klang Valley and do not turn up for follow-up. Almost all default further treatment.

We postulate that our low amputation rate in this group of patient may be attributed to the fact that patients with pseudoaneurysm may have formed collateral blood vessels. These collaterals are sufficient to prevent limb loss in the initial phase. A normal or elevated blood pressure is important in maintaining the collateral flow, as we have noted that hypotensive and septic patients tend to have more ischaemic limbs and higher rate of limb loss. It is however difficult to predict with total confidence which patients will suffer limb loss with ligation alone.

## Conclusion

Ligation of the proximal and distal arteries with excision

of the pseudoaneurysm in an IVDU with complete debridement of all necrotic tissue is a mode of treatment associated with a low amputation rate. It achieves the

initial aims of management which is to prevent exsanguinating haemorrhage and control of sepsis.

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## References

1. Patel KR, Semel L, and Clauss RH. Routine revascularisation with resection of infected femoral pseudoaneurysms from substance abuse. *J Vasc Surg* 1988; 8: 321-28.
2. Welch GH, Reid D, Pollock JG. Infected false aneurysms in the groin of intravenous drug abusers. *Br J Surg* 1990; 77: 330-33.
3. Zahrani HA. Vascular complications following intravascular self injection of addictive drugs. *J.R. Coll.Surg. Edinb*; 1997; 42: 50-55.
4. Feldman AJ and Berquer R. Management of an infected aneurysm of the groin secondary to drug abuse. *Surg Gyn Obs* 1983; 157: 519-22.
5. Yellin AE. Ruptured mycotic aneurysm- complication of parenteral drug abuse. *Arch Surg* 1977; 112: 981-86.
6. Cheng SWK, Fok M and Wong J. Infected femoral pseudoaneurysm in intravenous drug abusers. *Br. J Surg* 1992; 79: 510-12.
7. Padberg F, Hobson R, Lee B et al. Femoral pseudoaneurysm. from drugs of abuse : Ligation or reconstruction? *J Vasc Surg* 1992; 15: 642-48
8. Levi N, Rordam P, Jensen LP and Schroeder TV. Femoral pseudoaneurysm in drug addicts. *Eur J Vasc Endovasc Surg* 1997; 13: 361-62.
9. Johnson JR, Ledgewood AM and Lucas CE. Mycotic Aneurysm- New concepts in therapy. *Arch Surg* 1983; 116: 577-81.