PSEUDOANEURYSMS IN INTRAVENOUS DRUG ABUSERS

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ABSTRACT… Background: Intravenous drug abuse can lead to vascular complications, most frequent of which is pseudoaneurysm. These pseudoaneurysms (false aneurysms) are prone to rupture, leading to profuse hemorrhage and death. **Objective:** To evaluate pseudoaneurysms in intravenous drug addicts for the site, mode of presentation, management and outcome. **Design:** Descriptive study. **Place and duration of study:** Surgical unit I, Combined Military Hospital, Rawalpindi. Surgical unit 2, Combined Military Hospital, Lahore. January 2006 to September 2010. **Subjects and methods:** All cases of pseudoaneurysms in intravenous drug addicts who presented to a single vascular surgeon, between 1st January 2006 and 30th September 2010, were evaluated for site, mode of presentation, treatment and the outcome. Surgical procedures included excision of pseudoaneurysm with interpositioning of graft, repair of vascular rent, ligation of vessel and debridement. All cases were referred to psychiatrist for management of drug addiction. **Results:** Total 12 cases of pseudoaneurysms due to IV drug abuse were included in our study. Arteries affected included 9(75%) common femoral arteries (CFA). In 3(25%) cases, both common femoral artery and vein were involved with arteriovenous fistula between them. There was 1(8.3%) pseudoaneurysm each of external iliac artery, superficial femoral artery and brachial artery. Nine cases (75%) presented with recurrent hemorrhage from a swelling while in 3(25%) cases there was swelling with no history of hemorrhage. In 7(58.3%) cases, repair/grafting, while in 5(41.6%) cases ligation and debridement was done. There was seroma formation in 1(8.3%) case after excision and grafting. In none of the cases, in which artery was ligated, critical limb ischaemia occurred. **Conclusions:** Common femoral artery is the most frequent site of pseudoaneurysms in IV drug abuse. In those cases where vascular reconstruction is not possible due to extensive skin necrosis or infection, ligation of affected vessel is not only a life saving procedure but a safe option also.

Key words: False aneurysm, arteriovenous fistula, drug addicts.

INTRODUCTION

There is significant increase in intravenous drug abuse worldwide[1,2,3]. Over-the-counter availability of narcotic analgesics and quackery have significantly contributed towards this menace in our country. Most commonly a cocktail of different narcotic analgesics, sedatives and anti allergy drugs are used in our villages and towns. Many patients reporting to us have indicated the involvement of a mafia which not only supply these drugs but also guide them to a convenient way of injecting these drugs in large groin vessels. There is yet another group of patients who become addicted to these drugs as a result of indiscriminate/injudicious use of narcotic analgesics after repeated surgeries or for chronic pain.

IV drug abuse can lead to number of vascular complications including pseudoaneurysms, deep vein thrombosis (DVT), arterial stenosis, thromboembolism and arteriovenous fistula (AVF)[4]. Among these pseudoaneurysms are the most frequent presentation in many studies[5]. In our setup, many patients narrate self fabricated stories about the cause of swelling e.g. accidental prick by a thorn or puncture wound by a barbed wire.

Pseudoaneurysms can present as localized swelling with intact overlying skin or with infected and even necrotic skin1. Many present with recurrent or profuse hemorrhage. At times there is limb swelling or patient may present with acute or chronic limb ischemia[6].

Pseudoaneurysms in IV drug abusers have been managed by variety of procedures including patch angioplasty, excision and grafting, ligation with bypass, ligation with excision and endovascular repair[6]. The choice depends upon the presentation, site, anatomical details, presence of infection or skin necrosis and availability of expertise.

Although many studies show that there are ischaemic complications following simple ligation with excision of

pseudoaneurysm[3,4] most studies show it to be a safe procedure with least complication rate[1,7].

The aim of our study was to evaluate pseudoaneurysms in IV drug abusers for the site, presentation, management and the outcome of the treatment.

METHODOLOGY

This descriptive study was conducted at Surgical unit I, Combined Military Hospital, Rawalpindi and Surgical unit 2, Combined Military Hospital, Lahore from January 2006 to September 2010. All cases of pseudoaneurysms in intravenous drug addicts who presented to a single vascular surgeon, between 1st January 2006 and 30th September 2010, were evaluated for site, mode of presentation, treatment and the outcome. A predesigned questionnaire was used to collect the data which included age and gender of the patient, vessel involved and mode of presentation of pseudoaneurysm at the time of admission.

Postoperatively brief description of surgery performed was endorsed. Each patient was followed up for at least six months for appearance of any sign or symptom of ischaemia or loss of limb. Follow up data was recorded. In all cases except those who presented with acute hemorrhage, duplex scan followed by angiography were done. Emergency exploration was done in all cases of uncontrolled bleeding while earliest possible surgery was done in impending rupture (Fig 1), recurrent bleeding or overlying skin necrosis. Broad spectrum antibiotics were administered in all cases of infected pseudoaneurysms, with recurrent haemorrhage or acutely bleeding pseudoaneurysms without waiting for culture and sensitivity (CS) report. For femoral vessels pseudoaneurysms, proximal control was first achieved by exposing and clamping external iliac artery (vein, if required) through a transverse lower quadrant incision. Vessels distal to pseudoaneurysm were also controlled before dissecting the aneurysm. In cases with extensive skin necrosis, pseudoaneurysm was dissected, vessels proximal and distal to it ligated, sac excised and wound left open. Hand held doppler was used to detect blood flow in distal arteries. In all these cases there was adequate blood flow so no revascularization procedure was done. Patients were monitored for appearance of any sign or symptom of limb ischaemia. In none of these cases a revascularization procedure was required during follow up period. In cases of acceptable overlying skin, pseudoaneurysm was excised and reconstruction was done using long saphenous vein. Artificial graft was used in only two cases, one where LSV was not available bilaterally and second where external iliac artery was involved. Tissue from sac was sent for culture and sensitivity in each case however intravenous antibiotics covering both gram positive and gram negative organisms were started without waiting for the report. These were changed, if required, after getting the CS report and continued for at least five days postoperatively (seven days where artificial graft was used).Wounds that were left open were daily washed with normal saline and dressed with normal saline soaked sterilized gauze till there was healing by secondary intention or secondary suturing was done. All patients in which pseudoaneurysms were treated with ligation and excision, were put on intravenous heparin infusion 1000 IU/hr for at least five days and then on subcutaneous heparin 5000 IU/12 hr till the patient was ambulatory. In cases where grafting was done, only subcutaneous heparin 5000 IU/12 hr was given. All patients with drug abuse were referred to psychiatrist for further management. Patients were regularly followed up for appearance of any sign or symptom of limb ischaemia or appearance of any other complication of operative procedure which was endorsed in the follow up section of proforma. The type of drugs used, duration of drug abuse, frequency of injections and the CS report were not studied.

RESULTS

There was only one female (8.3%) and rest of eleven cases(91.6%) were male. The age ranged from 22 years to 45 years with mean age of 33.3 years. In only two cases (16.6%) right groin was affected while left groin and thigh was affected in 9 cases (75%) and left cubital fossa in one case (8.3%). Time interval between appearance of symptoms and reporting to hospital ranged from 1 day to 32 days (mean: 14.7 days).Mode of presentation is shown in Table-I.

In 9 cases (75%) common femoral artery was affected. In 3 cases (25%) out of these both CFA and CFV were

Presentation	No. of cases (%)
Recurrent hemorrhage from a swelling	9 (75%)
Pain	9 (75%)
Swelling with no history of hemorrhage	3 (25%)
Extensive skin necrosis	5 (41.6%)
Profuse bleeding at the time of presentation	2 (16.6%)

affected with AVF between them. There was one case each of superficial femoral artery, brachial artery and external iliac artery pseudoaneurysms.

In five cases (41.6%) there was extensive necrosis or cellulitis of surrounding skin (Fig 2) which precluded repair or grafting so these were treated by arterial ligation and excision. In total 7 cases (58.3%) repair or grafting was done. In one case (8.3%) debridement of arterial hole and repair by venous patch was done. In 2 cases (16.6%) ePTFE graft was used to bridge the gap after excision of pseudoaneurysm. In 4cases (33.3%) long saphenous vein was used as a conduit to restore the vascular continuity. In one case, in which ePTFE graft was used, there was formation of lymphocele in medial aspect of upper thigh. It was successfully managed by excision, ligation of lymphatics and packing of cavity by mobilized gracilis muscle. In five cases (41.6%) in which pseudoaneurysm was excised without restoration of vascular continuity, one brachial artery (8.3%), 2 superficial femoral arteries (16.6%) and 2 common femoral arteries (16.6%) were involved. In one case of CFA pseudoaneurysm (8.3%), there was extensive thrombosis of sac and complete occlusion of artery distal to aneurysm. In none of these critical limb ischaemia occurred during follow up. Only one case had intermittent claudication at thirty yards. There was no limb loss in any of the 12 cases during 6 months follow up.

DISCUSSION

Vascular complications of intravenous drug abuse include cellulitis, abscess formation, skin necrosis, pseudoaneurysm, arteriovenous fistula, thrombosis and distal embolisation. Out of these our study focused mainly on pseudoaneurysms.

Fig-1. Impending rupture, pseudoaneurysm of superficial femoral artery

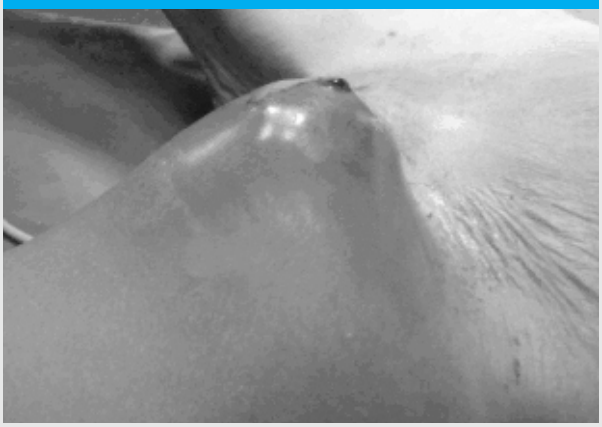

Fig-2. Extensive necrosis of overlying skin in pseudoaneurysm

Fig-3. Recurrent haemorrhage from a pseudoaneurysm

Similar to majority of studies, most of our patients belonged to younger age group[1,4,5,6,7].

Pseudoaneurysms in IV drug abusers have been reported at different sites like groin, cubital fossa, thigh, popliteal fossa and clavicular region. The femoral artery is the most common site for a mycotic pseudoaneurysm. In our study left groin was the most common site affected. In one of series reviewed by Salimi J et al although groin was the most frequent site affected, right side was predominantly involved.

In our patients the dominating presentation was recurrent hemorrhage from a swelling (Fig 3) while in most of the foreign studies the commonest presentation was pain in the swelling. It shows that our patient disclosed their problem quite late, only when there was repeated alarming bleeding from the site.

Incidence of patients presenting with acute hemorrhage is only 16.6 % in our study which is comparable to most of other series.

Management options include arterial ligation and debridement[5], arterial repair by end-to-end anastomosis[8] or patchplasty[9], reconstruction by grafting[5], extra anatomical bypass[5], using internal iliac artery as a conduit[5], thrombin injection6 and endovascular repair[10]. Although arterial reconstruction seems attractive, there are certain problems associated with it. Most of the times there is extensive necrosis of overlying skin or wound infection which precludes the reconstructive option. Many a times superficial veins are not available due to repeated IV injections[6] causing thrombosis and even fibrosis of veins. Various workers have suggested the use of deep veins of lower limbs as the grafts[11,12] however, even popliteal and superficial femoral vein is not available due to deep vein thrombosis[6]. Although there is an ever going debate between advocates of ligation and of reconstruction as the preferred modality, we believe that the best treatment modality depends upon the local conditions of the site, availability of vein, general condition of the patient, affected vessel, available resources and expertise of the surgeon.

In 58.3% of our cases primary repair or grafting was done which is relatively high as compared to other reported cases[1,3,4,6,7]. The reason may be that in more than half of our patients overlying skin was reasonably healthy. Both R. A. Yegane[3] and Mohammad-Taghi Salehian[13] in their studies showed clear dominance of cases which were treated by ligation and excision. On the contrary, Jack W. Tsao[14] study was similar to ours with seven vascular reconstructions out of total eleven cases.

Many workers have managed all of their cases by ligation and excision. All the 32 operations in Mohammad Ali Mohammadzade[7] study were simple arterial ligation. Zuo-Jun Hu et al treated all of his 54 cases by femoral artery ligation and concomitant thrombectomy[1]. However, open collateral circulations was assessed by intraoperative angiography which also included mean arterial pressure of back flow from the profunda femoris and SFA after operation. Arterial ligation has been reported in these studies to be a safe and reliable procedure[1,7]; however, it is associated with significant intermittent claudication[7,13] and some incidence of critical limb ischaemia[3,4,9]. In none of our 5 cases (41.6%) critical ischemic symptoms occurred. The reason may be that in 2 and 1 case, SFA and brachial artery respectively were affected. Both of these arteries are well compensated by profunda femoris and anastomosis around elbow joint respectively. Both CFA pseudoaneurysms were extensively thrombosed, with complete occlusion of distal artery in one, which most likely had led to formations of collaterals gradually.

The use of internal iliac artery for arterial reconstruction after femoral artery pseudoaneurysm excision in drug abusers has been reported to be a safe and effective modality[5]. However, this technique has not been widely accepted till now. Many centers have reported successful use of stent graft in treating pseudoaneurysms in drug addicts[10]. Due to high risk of graft infection and vessel necrosis, majority of vascular specialists are reluctant to opt for endovascular techniques. Although Colin Peirce used ultrasound guided Thrombin injection in pseudoaneurysms with narrow neck[6], the results were not very encouraging. It also had to face some criticism[15] as simple ligation has

been proved to be a safe and reliable modality.

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