

Surgical Treatment of Traumatic Pseudoaneurysm

Sandesh Bharat Singh*, Aakash Jain and Arun Kumar Singh
Department of Plastic Surgery, King George Medical University, India

Corresponding Author*

Sandesh Bharat Singh Department of Plastic Surgery, King George Medical University
India
E-mail: dr.sndsh@gmail.com
Tel no: +919869061455

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Abstract

Objective: To summarize our experience in surgical treatment of traumatic pseudoaneurysm.

Method: 5 patients with traumatic pseudoaneurysm were surgically treated in our department from January 2015 to December 2018.

Result and Discussion: All the patients were successfully treated. Pseudoaneurysm disappeared after treatment. A surgical operation is suitable to most pseudoaneurysms, but its damage is relatively obvious and usually leads to more bleeding. It also requires a longer operating time. All patients were followed up once per month for 12 months by colour doppler ultrasound examination. There were no cases of pseudoaneurysm recurrence.

Conclusion: Surgical operations are safe and effective in the treatment of pseudoaneurysm.

Keywords: Pseudoaneurysm • Transplantation

Introduction

Pseudoaneurysms, or false aneurysms, are pulsatile masses, consisting of an anomalous communication between a ruptured vessel and the surrounding soft tissues, encircled by a fibrous capsule [1]. Pseudoaneurysms are associated with penetrating trauma, high-injury blunt trauma, bone fractures, sports activities and less frequently after orthopedic interventions [2]. Pseudoaneurysm resulting from trauma or iatrogenic injury can bring about various complications. If left untreated or if it is not treated properly, it can even threaten patient's life. Complications of pseudoaneurysms include local pain, rupture, neuropathy and local skin ischemia. It may also result in local sepsis and abscess formation which may rupture and cause subsequent haemorrhage [3].

Case Presentation

Case 1

A 2 years old female child had a history of fall of glass table-top over the ankle of right foot 2 months back. Patient had deep lacerated wound which was initially managed with primary suturing at local dispensary. Patient complaint of swelling at dorsum of ankle and inability to dorsiflex toes few days after the incident. Patient was examined, a pulsatile swelling was felt at the injury site. Patient underwent preoperative workup for confirmation of diagnosis and fitness for surgery. Intra operative a pseudoaneurysm was found in anterior tibial artery along with transected anterior tibial nerve, tibialis anterior, EHL, EDL. Excision of pseudoaneurysm of anterior tibial artery and primary repair of anterior tibial artery along with repair of anterior tibial nerve, tibialis anterior, EHL and EDL. Patient was given splintage for 6 weeks and then night splintage for 6 more weeks. She recovered well and ATA patency was confirmed on post op doppler scan.

Case 2

A 7 years old male child with history of trauma with cricket bat blow to the left lower leg. Patient c/o difficulty in walking and complaint of pain. Patients parent noticed a bluish swelling over the injury site which was gradually increasing in size for last two weeks. Initially patient was managed on analgesics and compression bandages but swelling persisted even after two weeks of conservative management. Patient then brought to plastic surgery OPD where on examination a pulsatile swelling was noted at the lower end of leg approximately 2 cm above ankle. On USG doppler pseudoaneurysm of anterior tibial artery was confirmed. Exploration was done. Pseudoaneurysm was excised and anterior tibial artery was primarily repaired. Patient was given splintage for 6 weeks and then night splintage for 6 more weeks. He recovered well and ATA patency was confirmed on post op doppler scan.

Case 3

A 15 years male sustained a manja cut injury over the neck 2 months back before presentation. Neck wound was sutured primarily by some local doctor. Patient noticed a swelling beneath the healed suture line which was initially soft and later become firm. It suddenly increased in size. On Doppler USG a pseudoaneurysm of left IJV was confirmed. The swelling was explored under GA. The pseudoaneurysm was excised, hematoma was evacuated and Left IJV was ligated proximally and distally.

Case 4

26 years old male patient with 1-week old history of accidental cut injury over right lower leg with wood cutting machine. Patient complaint of rapidly growing swelling near medial malleolus at the injury site. USG doppler was suggestive of pseudoaneurysm of right posterior tibial artery. Intraoperatively the pseudoaneurysm got ruptured and the posterior tibial artery was ligated.

Case 5

45 year male patient presented with history of 1 month old glass cut injury of left forearm. Patient underwent suturing of the lacerated wound at nearby medical center. Later patient noticed a swelling at injury site which insidiously increased in size to about 4x3 cm and changed its consistency from soft to firm. The skin over the swelling had blackish discoloration. On USG doppler a pseudoaneurysm of left cephalic vein was confirmed and exploration was planned. The pseudoaneurysm was excised after ligating the vein proximally and distally to the pseudoaneurysm. Patient recovered well and sutures were removed after one week of surgery.

Method

5 patients with traumatic pseudoaneurysm were surgically treated in our department from January 2015 to January 2018. Preoperative history taking, examination was done with proper perform. Ultrasonography of the swelling was done. Patients consent was taken. Departmental Ethical Clearance was done. All 5 patients received either operative or interventional treatment. All patients were followed up once per month for 12 months by colour doppler ultrasound examination. There were no cases of pseudoaneurysm recurrence.

Results

Demirbas reported a high success rate when pseudoaneurysm was small and diagnosed early [4]. Self-healing is difficult when the diameter of the pseudoaneurysm neck is greater than 5 mm, the systolic blood flow rate is greater than 100 cm/second, and the diameter of the pseudoaneurysm is greater than 18 mm. The swift and accurate diagnosis of acute arterial occlusion and limb ischemia is critical to prevent morbidity from this vascular emergency [5]. Surgical treatment is preferable for these patients. Therapies for peripheral artery pseudoaneurysm consist of compression, surgery with arterial ligation, blood vessel-transplantation, ultrasound-guided

thrombin injection, stent-graft placement, and endovascular coil embolization. The choice of treatment depends not only on the overall size, neck diameter, and location of the pseudoaneurysm, but also on the patient's clinical condition. In present study of the five patients two were successfully operated by primary excision and repair. While three of them had to undergo ligation surgery of the vessel (Figure 1-4). For complicated cases, operation remains the standard treatment. In cases where exploration is difficult due to swollen soft tissues and ongoing bleeding, other less invasive methods are more attractive. With the development of minimally invasive techniques, endovascular treatment has been widely applied [6,7]. Pseudoaneurysm can bring about serious complications such as compression, infection, rupture and hemorrhage, as well as embolism. Both operative and intravascular interventional therapies are positive and effective [7]. Surgical operation is suitable to most pseudoaneurysm cases. Though, it requires longer operating time. Compared to the surgical operation, intervention therapy is less traumatic, and patients have a quicker recovery; however it is much more expensive and there is limitation in the choice of interventional therapy.

There was no intra and postoperative mortality in our study.

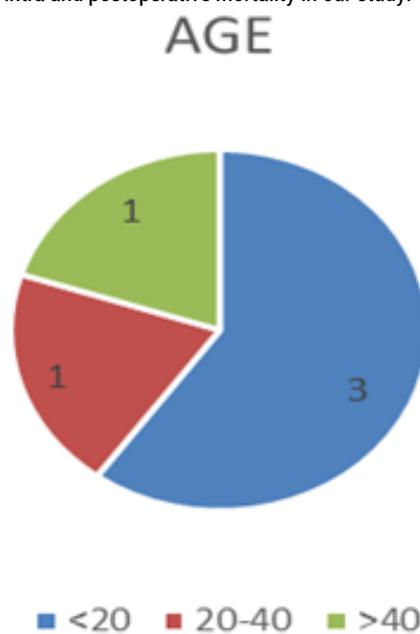


Figure 1. Age of the 5 cases, 3 of them were below 20 years of age. Unguided injuries are common in young population.

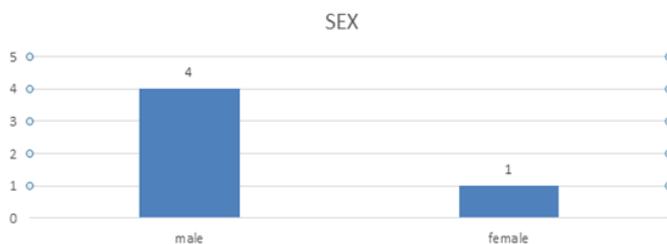


Figure 2. Sex of 4 of the 5 cases were male patients.



Figure 3. Injured body part of 3 of the 5 cases had involvement of lower limb. 1 had involvement of neck and upper limb respectively.

TREATMENT

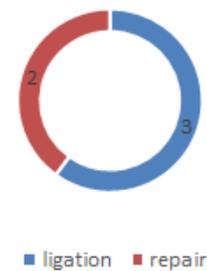


Figure 4. Treatment

Complications

There were no complications reported

Conclusion

Pseudoaneurysm can bring about serious complications such as compression, infection, rupture and hemorrhage, as well as embolism. Both operative and intravascular interventional therapies are positive and effective. Surgical operation is suitable to most pseudoaneurysm cases. Though, it requires longer operating time. Compared to the surgical operation, intervention therapy is less traumatic, and patients have a quicker recovery; however it is much more expensive and there is limitation in the choice of interventional therapy.

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