

Delayed Onset of Pseudoaneurysm in Brachial Stab Wound Trauma: A Case Report

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Abstract: Pseudoaneurysms of the extremity are rare and may present acutely or subacutely. Very rarely, the presence of thromboembolism in the aneurysm can result in terminal ischemia, gangrene, and amputation. Only early diagnosis and treatment can prevent progression to significant disability. This case report described a 36-year-old male referred to the hospital with a complaint of a lump in the upper left arm for two months before admission. The patient reported a history of being punctured by a nail, and one week later, an enlarging lump appeared. The patient also complained of a lump on the right chin for one month before hospital admission. The patient was then diagnosed with an impending rupture of the left brachial pseudoaneurysm due to a puncture wound in the left brachial and was scheduled for arterial repair. Although the diagnosis and treatment of the patient were delayed for two months and treated surgically, no immediate or late complications were seen. This case underscores the crucial role of timely diagnosis and surgical treatment, as upper extremity aneurysms can cause severe decreases in function and lead to the loss of an arm or fingers. The successful surgical reconstruction in this case is a motivating example of the preferred treatment for such patients.

Keywords: pseudoaneurysm; brachial artery; repair artery; delayed onset

INTRODUCTION

Pseudoaneurysms of the extremity are rare and may present acutely or subacutely.¹ A brachial artery aneurysm usually presents as a pseudoaneurysm, and its etiology is classified into three types: congenital, systemic disease, and sequelae of trauma. Very rarely, the presence of thromboembolism in the aneurysm can result in terminal ischemia, gangrene, and amputation. In such cases, only early diagnosis and treatment can prevent progression to significant disability.² Additional examinations, such as imaging investigations, are essential to assess Pseudoaneurysm, and other imaging modalities can be used, such as Doppler ultrasonography, MRA, and CT-Angiography. The management of pseudoaneurysms differs according to the size, site/location, pathogenesis, and accessibility of the pseudoaneurysm.³ We report a case of a delayed onset of pseudoaneurysm in brachial stab wound trauma.

CASE REPORT

A 36-year-old male was referred to the hospital with a complaint of a lump in the upper left arm for two months before admission. The patient reported a history of being punctured by a nail, and one week later, an enlarging lump appeared. The patient also complained of a lump on the right chin for one month before hospital admission. There was numbness in the thumb and index finger, and pain at the fingertips. Erythema on the left palm. The patient had a history of six months of treatment for tuberculosis, which was completed. The patient was then taken to Manado Regional General Hospital before being referred to Kandou General Hospital for further management.

On physical examination, there is a lump size 10 x 13 cm, fixed, pulsating, elastic, and bruit in the left brachial region (Figure 1). The patient was also found to have multiple enlarged lymph nodes in the cervical region at levels III-IV. Distal status was within normal limits (Figure 2).

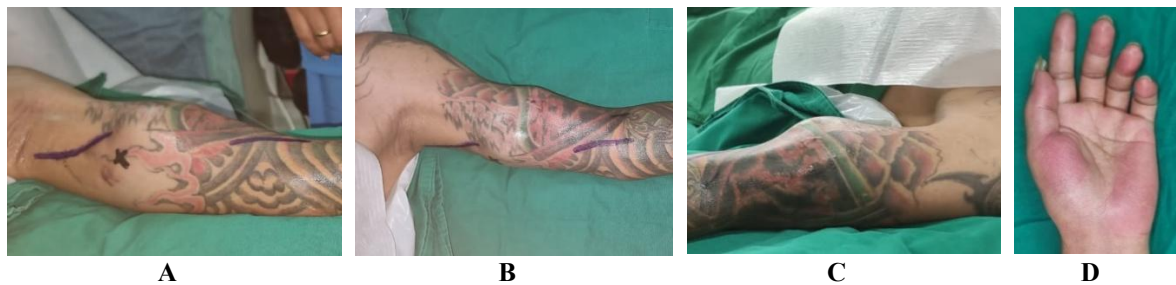


Figure 1. Lump in the upper left arm (A: inferior view; B: anterior view; C: superior view; D: erythema on left palm)

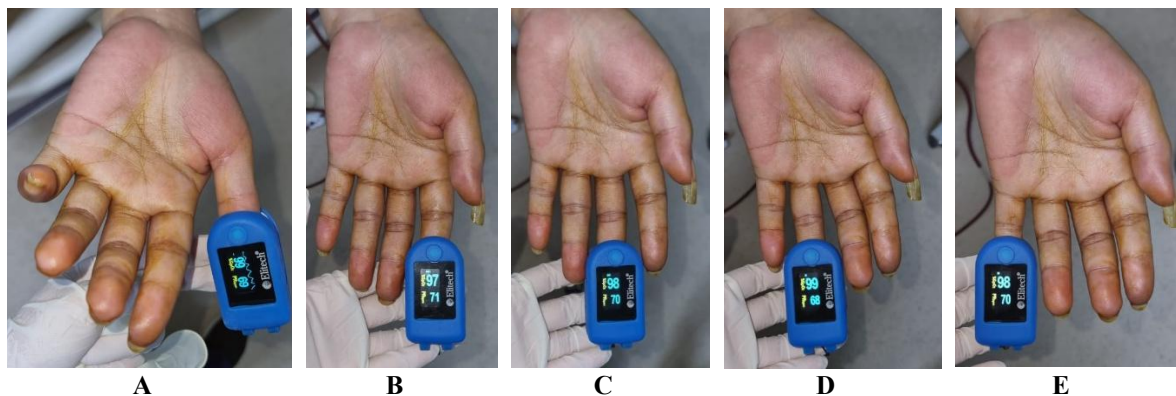


Figure 2. Assessment of distal status using oxygen saturation and pulse parameters (A: thumb; B: index finger; C: middle finger; D: ring finger; E: little finger)

The patient was then diagnosed with an Impending rupture of the left brachial pseudoaneurysm due to a puncture wound in the left brachial and was scheduled for arterial repair.

The operative location was identified, revealing a 10 x 5 cm pulsatile lump. An incision was made 1 cm proximal to the lump and 3 cm distal. The left brachial artery was identified proximally and distally, followed by the placement of vessel loops for proximal and distal control. The dissection was carried deeper until reaching the pseudoaneurysm sac. When the pseudoaneurysm sac was opened, 200 cc of hematoma clot was evacuated. Active bleeding was present. Hemorrhage control was performed on the brachial artery. The brachial artery was identified and free from surrounding tissue and the pseudoaneurysm sac (Figure 3).

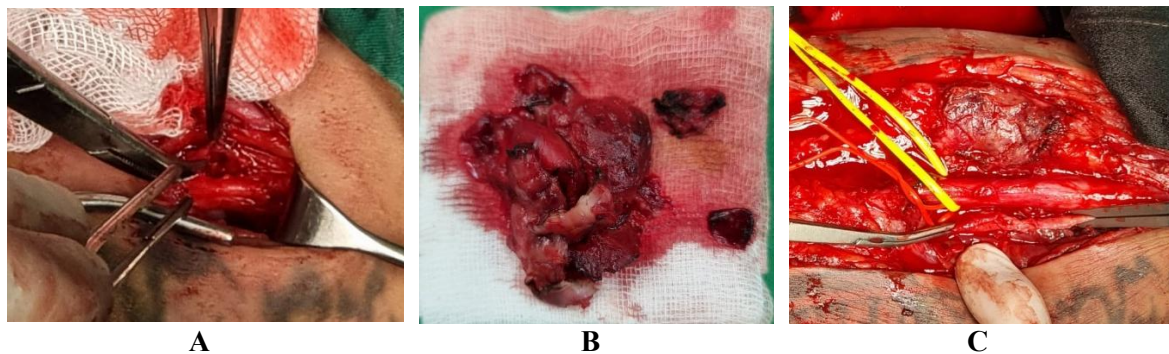


Figure 3. Arterial repair procedure (a: near total, partial rupture of the brachial artery, b: Hematoma clot, c: arterial repair)

A near-total partial rupture of the brachial artery was observed close to the median nerve. Arterial repair was performed using end-to-end anastomosis of the brachial artery with monofilament 6.0 under vascular clamp assistance. The vascular clamps were removed, distal flow was present, and no tension was observed. Bleeding was controlled using hemostatic agents. A surgical drain was placed, and the wound was closed layer by layer. The skin was sutured using an interrupted technique, marking the completion of the surgery (Figure 4).

The patient underwent inpatient care for six days with routine treatment. Good outcomes were observed during the drainage placement, and the wound was well maintained. There were no signs of recurrence during hospitalization or after the surgery.



Figure 4. Evaluation of drain and wound during treatment

DISCUSSION

Pseudoaneurysms of the extremity, especially the peripheral artery, are rare and may present acutely or sub-acutely. This case underscores the crucial role of timely diagnosis and surgical treatment, as upper extremity aneurysms can cause severe decreases in function and lead to the loss of an arm or fingers. The successful surgical reconstruction in this case is a motivating example of the preferred treatment for such patients.¹ Brachial artery pseudoaneurysm can be formed by three etiologies, and penetrating injury is the most common mechanism. In this case, the pseudoaneurysm is caused by a nail puncture.⁴

The brachial artery pseudoaneurysm usually develops slowly. It took days to months, even years, to develop symptoms and often presented with erythema and induration, painful mass

sometimes accompanied by a thrill or an audible bruit, decreased temperature, cyanosis, loss of pulsation, and paresthesia upon nerve compression of the distal extremity.^{2,4} In this study, pseudoaneurysms usually develop slowly. It took one week after a history of being punctured by a nail, then two months after an enlarging lump appeared. There is erythema on the left palm and pain in the fingers. Meanwhile, in a study by Jun Yong Lee et al., they report that their case did not show the symptoms of pseudoaneurysm, and make the authors did not suspect a brachial arterial pseudoaneurysm at first².

The initial diagnosis could be assessed using a color Doppler ultrasound. Various diagnostic methods, including angiography, CT, and MRI, can be used. Although selective arteriography is a gold standard, high-resolution duplex USG is faster, more cost-effective, and more available in the emergency department.^{1,3,5} The only treatment option was immediate open repair to prevent the expansion of the pseudoaneurysm. There are variations in non-invasive options, including conservative treatment. The most common minimally invasive techniques are injection of thrombin with or without factor XII, deployment of covered stents, and anatomic location permitting.⁶ The indication for surgical intervention for brachial artery pseudoaneurysm is a rapidly expanding aneurysm, causing distal ischemia, rupturing, becoming infected, or causing neurological symptoms due to local pressure on nearby nerves, mainly when less invasive methods like ultrasound-guide compression or percutaneous thrombin injection are not suitable or have failed.⁸

There is no recurrence of the pseudoaneurysm during the postoperative follow-up period, and there are no complications as judged by the quality of the wound and the drain installed. The non-recurrence is likely due to removing the adhesions around the neurovascular bundle when excising the pseudoaneurysm. However, as adhesion-induced nerve-vessel damage can occur later, a close follow-up is required.^{2,9}

Treatment delay causes hemorrhage, venous edema, cutaneous erosion, and adjacent neurological structure compression to develop due to enlargement of pseudoaneurysm. The first symptoms of upper extremity aneurysm can be nerve injury or adjoining nerve compression.^{5, 10} Although the diagnosis and treatment of the patient in this case was delayed for two months and treated surgically, no immediate or late complications were seen.

CONCLUSION

Brachial artery pseudoaneurysm is a rare condition that can develop slowly, presenting with symptoms such as a painful mass, erythema, decreased temperature, cyanosis, and paresthesia due to nerve compression. In this case, we're grateful that the patient was without complications when the diagnosis was delayed about two months. Early diagnosis and treatment can prevent progression to significant disability. Diagnosis can be made using color Doppler ultrasound, angiography, CT, or MRI, with duplex ultrasound being a faster and more cost-effective option. The primary treatment is immediate open repair to prevent complications, especially in rapid expansion and distal ischemia.

Conflict of Interest

The authors affirm no conflict of interest in this study.

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