

Case Report

A rare case of a true (degenerative) axillary artery aneurysm, secondary to chronic usage of crutches and its surgical management

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ABSTRACT

Aneurysms of the axillary artery are rare but potentially dangerous lesions that threaten the upper extremity with vascular and neurologic compromise. These aneurysms may arise as an aneurysm or pseudoaneurysm secondary to trauma or iatrogenic complications, or as degenerative lesions but secondary to the chronic use of crutches is rare. Inappropriate placement of the patient's body weight on the axillary pad by the crutch causes repetitive trauma to an axillary artery leading to stenosis or aneurysm formation. The signs and symptoms vary with the cause of the aneurysm. It may include mass effects with brachial plexus compression and thromboembolic events involving the hands and fingers. Treatment should be considered in most of these lesions to prevent spontaneous rupture or microembolisation to the extremity leading to ischemia, gangrene, and amputation of the affected extremity. Surgical resection of aneurysm remains mainstay treatment followed by either interposition graft or direct end to end anastomosis.

Keywords: Axillary artery, Aneurysm, Crutches, Pseudoaneurysm, Atherosclerosis

INTRODUCTION

The aneurysm of the axillary artery are rare lesions in most clinical practice.¹ The majority are pseudoaneurysms due to trauma or iatrogenic injuries. True aneurysms are even rarer and majority of lesions are due to degenerative atherosclerosis. Secondary to chronic crutch usage leading to the true aneurysm is very rare. These aneurysm lesions threaten the involved upper extremity with the risk of rupture, thrombosis and embolic complications. The compression of the brachial plexus also occur, and rupture with haemorrhage is a rare but sometimes fatal presentation.^{2,3} Most sizable aneurysms of the axillary artery should be repaired. Resection with interposition of grafting is the usual surgical procedure done.

A rare case of true axillary artery aneurysm, in which instead of vascular grafting, resection followed by end-to-end anastomosis of the axillary artery has been done.

CASE REPORT

A seventy five year male presented with an otherwise asymptomatic pulsatile mass in the left axilla since 1 year. Patient was crippled since birth due to poliomyelitis and used crutches to walk for last 60 years. The patient had no other significant cardiovascular risk factors, nor any previous history of deep venous thrombosis suggesting a hypercoagulable state. The patient was a chronic tobacco abuser for 40 years.

On examination, a pulsating swelling was about 4 × 3 cm sized, single, mobile, non-tender, non-fluctuating, non-

compressible, and soft in consistency with no local redness, no localized rise in temperature. No signs of vascular insufficiency of the upper extremity or evidence of neurologic compromise were noted.

The patient was advised left upper limb arterio-venous doppler (Figure 1) which showed a fusiform aneurysm of the left axillary artery. Further, a CT angiography (Figure 2) was done of the upper limb, which confirmed the diagnosis.

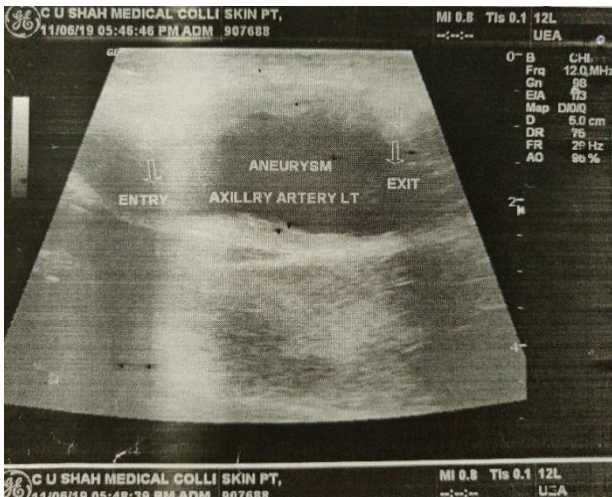


Figure 1: Doppler picture of axillary artery aneurysm.



Figure 2: CT angiography of axillary artery aneurysm.

Surgical technique

The patient was treated surgically under local anaesthesia. The patient was placed in a supine position with the shoulder slightly elevated and the arm in a horizontal position. A vertical skin incision was placed over the swelling in the direction of apex. Normal

axillary artery segments proximal and distal to the aneurysm were explored and looped (Figure 3). The aneurysm was resected after clamping of proximal and distal arterial segments. The intravenous injection of 5,000 IU of heparin. After aneurysmectomy, the proximal and distal arterial segments were mobilized and end-to-end anastomosis of the axillary artery with 6-0 prolene was done (Figure 4 and 5).



Figure 3: Exposed axillary artery aneurysm.



Figure 4 (A and B): Resected axillary artery aneurysm.

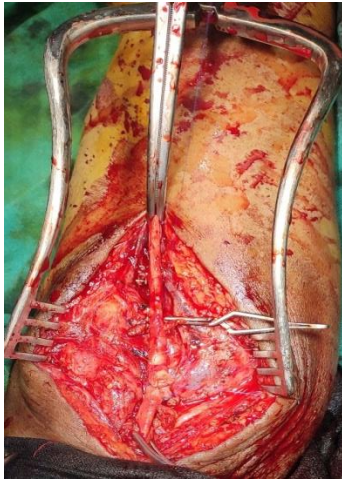


Figure 5: End to end anastomosis.

DISCUSSION

The crutches induced aneurysms of the axillary artery were first reported as early as 1930.¹ Repetitive trauma due to the use of axillary crutch causes disruption and degeneration of the tunica intima and tunica media leading to the formation of an aneurysm or stenosis.^{2,3} The pathological examination of the axillary artery reveal fragmentation of the intima and elastic layers associated with a perivascular fibrous reaction. Intimal disruption leads to thrombogenesis and it showers of small emboli, which gradually occlude distal vessels and lead to later ischemic episode. The commonest presentation is in the form of sudden ischemia of the upper limb, for this reason, surgical treatment is suggested on the discovery of an aneurysm even if asymptomatic.

There are two types of aneurysms associated with axillary artery- pseudoaneurysm and true aneurysm. The majority of reported aneurysms of the axillary artery appear to be pseudoaneurysm. Most are caused by blunt trauma or penetrating trauma.^{4,6}

True aneurysms occur less frequently in most series and caused by variety of inflammatory syndromes or systemic processes such as Kawasaki's disease, Bechet's disease, tuberous sclerosis, fibromuscular dysplasia, sarcoidosis, and Ehlers-Danlos syndrome but rather unheard due to chronic usage of crutches. In our case, the chronic use of crutches is responsible for true aneurysm formation due to degenerative changes.^{5,6}

Pseudoaneurysm present with pain or other neurologic signs from localized compression. True aneurysms, on the other hand, most often present as asymptomatic masses, although a few may present with the sequelae of brachial plexus compression.

Aneurysms of the axillary artery may also present with thromboembolic complications, which arises from the laminated intraluminal thrombus.⁵ Other less common

presentations include rupture and haemorrhage of aneurysm.

The mainstay of treatment for aneurysms of the axillary artery is surgery. Resection and replacement with a suitable graft is the preferred approach. The majority of authors favour the use of reversed autogenous saphenous vein grafts over polytetrafluoroethylene material for upper-extremity arterial replacement. Others have recommended proximal and distal ligation of the aneurysm with subsequent bypass grafting to optimize limb blood flow. The transcatheter embolization of the involved portion of the axillary artery followed by extra-anatomic bypass grafting has also been reported.⁷

In our case, though the gap was big and actually needed interposition with graft but we avoided in view of patient dependency on crutches after surgery. Crutches would have caused early blockage of grafts, so we preferred anatomical end to end axillary artery anastomosis. We mobilized proximal and distal segments to anastomosis directly without the use of graft. There was no tension at the anastomotic site. It would give long life for patency of the vessel and less likely chance of immediate complication which are usually found in artificial grafts.

CONCLUSION

As such axillary artery aneurysm is rare, particularly true aneurysms. A true axillary artery aneurysm due to the usage of crutches is unheard. Majority of pseudoaneurysm are symptomatic as they are due to the acute incidents, but in degenerative aneurysms, remains asymptomatic for long time.

In most cases, either aneurysm is resected and interposed with graft or vein, in few cases ligations of aneurysm followed bypass using various grafts are done.

Here we tried a novel approach of surgery by doing anatomical resection and end-to-end anastomosis instead of using a graft to avoid early and late complications of occlusion of grafts in a patient, who is dependent on crutches. Using this technique, an excellent result obtained with no post-operative complications.

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REFERENCES

1. De Luccia N, Albers MT, Wolosker M. Axillary artery aneurysm due to the use of crutches. *Rev Paul Med.* 1979;94(3-4):87-9.
2. Tripp HF, Cook JW. Axillary artery aneurysms. *Mil Med.* 1998;163:653.
3. Szuchmacher PH, Freed JS. Axillary aneurysms. *NY State J Med.* 1980;80:795-6.

4. Tetik O, Yilik L, Besir Y, Can A, Ozbek C, Akcay A, et al. Surgical treatment of axillary artery aneurysm. *Tex Heart Inst J*. 2005;32(2):186–8.
5. Moon IS, Hwang JK, Kim JI. Recurrent upper extremity embolism due to a crutch-induced arterial injury: a different cause of upper extremity embolism. *Ann*. 2010;24(4):554.e7-12.
6. Tiesenhausen K, Amann W, Koch G, Kern M, Scholz R. Arterial complications caused by using an axillary crutch. *Z Orthop Ihre Grenzgeb*. 2000;138(6):544-6.
7. McCarthy WJ, Flinn WR, Yao JS, Williams LR, Bergan JJ. Result of bypass grafting for upper limb ischemia. *J Vasc Surg*. 1986;3:741–6.

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