



## **A Pseudoaneurysm of the Medial Inferior Genicular Artery following Knee Trauma : A Rare Entity**

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**Abstract**

*Pseudoaneurysm of genicular arteries are extremely rare clinical entity. Usually these are encountered in young and athletes who are more prone to knee trauma and requiring reconstructive orthopedic procedures. We report a case of pseudoaneurysm of genicular artery in a 4-year-old child following trauma. Radiographic imaging included a doppler ultrasound and CT angiography. Pseudoaneurysm was successfully treated with ligation of feeding vessel. The causes, presentation, diagnosis, and management of genicular arteries are discussed in this case report.*

**Keywords:** *Pseudoaneurysm, Genicular artery, Ligation*

**Introduction**

A pseudoaneurysm, also termed a false aneurysm, is a leakage of arterial blood from an artery into the surrounding tissue with a persistent communication between the originating artery and the resultant adjacent cavity.<sup>1</sup> Pseudo aneurysm around knee usually result from Total knee arthroplasty though the incidence of this complication is not that much.<sup>2</sup> A high index of suspicion usually helps in early identification and treatment. However, trauma around knee may also result in pseudoaneurysm formation.

We describe a case of pseudoaneurysm of inferior genicular artery resulting from trauma on knee in a four years old child.

**Case Presentation**

A four years old child was brought in surgical clinic with swelling at the left knee. The child had penetrating trauma two weeks ago at home and was seen at local health center where wound was washed and sutured. Sutures were removed at local health center after 10 days but patient presented to surgical clinic with painful swelling at the wound. Examination revealing a swelling of about 2x3 cm impending

to rupture, with overlying skin red, warm with blackish edges, and pulsating. (Fig:1) Child had limited movements of left knee due to pain.

Initially a soft tissue Ultrasound was done revealing a well-defined hypochoic lesion measuring 2.4x1.7 cm. The lesion shows ying yang sign in color doppler. (Fig:2) The lesion was continuous with small vessels measuring 4 mm. Findings were suggestive of post traumatic pseudoaneurysm.

CT angiography was performed and it revealed partial opacification of thick wall cystic lesion in front of upper tibia measuring about 1.9x1.8x1.9 cm in three orthogonal dimensions and its neck was 3 mm in diameter. The lesion was communicating with infra-genicular part of popliteal artery at 4.2 cm proximal to its bifurcation through a defect of 1.4 mm in anterior wall of popliteal artery. No gross leak of contrast seen at the time of scan. CT angiography findings were consistent of partially thrombosed medial inferior genicular artery pseudo aneurysm. ( Fig:3) Blood work up was normal except for C reactive protein which was 12 mg/l ( 0-5)

Parents were informed about the surgery and informed written consent was taken.

Incision was made on posterior border of tibia; active bleeder was encountered due to fragile tissues. Popliteal artery was exposed and proximal control was achieved. Medial inferior genicular artery and hematoma exposed along with damaged artery. Healthy segment of the feeding artery was ligated underneath the medial collateral ligament. ( Fig:4 ) With elliptical skin incision around the wound, necrotic tissues were removed and Hematoma evacuated. Medial collateral ligament tear was repaired by Ortho team Necrotic tissues were sent for culture/ sensitivity.

Post operatively patient had uneventful recovery. Distal Pulses were intact. Tissue c/s grew *Staphylococcus aureus* and treated with appropriate antibiotics. Patient was later followed in clinic; wound was found coopted and sutures were removed. ( Fig:5) The child was walking with normal gait post-operatively.



Fig 1: showing the pulsatile swelling and marking on incision



Fig. 2 . Doppler Ultrasound showing Ying Yang Sign



Fig. 3: CT Angiography showing Pseudoaneurysm of Medial Inferior Genicular artery ( red arrow)



Fig. 4: Operative picture of Pseudoaneurysm



Fig. 5: postoperative picture showing complete healing of both wounds

## Discussion

An arterial pseudoaneurysm also called as false aneurysm, is caused by damage to the arterial wall, resulting in locally contained hematoma with turbulent blood flow and a neck that typically does not close spontaneously once past a certain size. Pseudoaneurysm does not contain any layers of vessel wall like true aneurysm. The commonest causes of pseudoaneurysm are iatrogenic following arterial access for endovascular procedures, vascular anastomotic failure, infection around vessels and trauma. Pseudoaneurysm around knee are infrequently reported after Total knee Replacement showing an incidence up to 0.2%.<sup>3</sup>

Clinical presentation differs from patients to patients. Those having pseudoaneurysm following Knee arthroplasty present with pain, difficulty in walking and swelling. Examination usually reveal knee swelling which is pulsatile and limitation of knee movement. Distal pulses may or may not be decreased. The Doppler ultrasound is the first line of investigation. Doppler Ultrasound reveals the “Yin- Yang sign” which indicates bidirectional flow due to swirling of blood within the pseudoaneurysm as the portion that moved toward the transducer is red and the portion that moves away from the transducer is blue.<sup>1</sup> Doppler

ultrasound can also evaluate for size, anatomy, and origin of pseudoaneurysms. Ultrasound is cheap, non-invasive and easily available modality of investigation. However, CT angiography remains a better option for both diagnosis and treatment with embolization. Option of embolization was not available in our case.

The different treatment options for pseudoaneurysm around the knee depends on the size and site of aneurysm. The management options range from Doppler guided compression percutaneous thrombin or fibrin injection, embolization and surgical repair.<sup>4,5</sup> Various surgical repair options include thrombectomy, oversewing, ligation, arterial wall repair by patch, vein graft or arterial bypass. In our case ligation of feeding artery was successfully done.

High index of suspicion should always be made for potentially dangerous complication around the knee which may result in limb or life threatening. It warrants especial attention for this uncommon complication.

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