

Tibial Periosteal Ganglion Cyst: A Rare Case of Non Traumatic Leg Swelling

MOUNISHA KETHINENI¹, VENKATESH MANCHIKANTI², NVK SUNDEEP³

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ABSTRACT

Soft tissue ganglion cysts are most commonly seen around the wrist and arise from myxomatous degeneration of periarticular connective tissue. A lesion produced by the mucoid degeneration and cyst formation in the periosteum of long bones is called a “periosteal ganglion”. These are commonly found in the lower extremities. In this article, we present a case of a 50-year-old female who presented with swelling and dull aching pain over the upper 1/3rd of the left leg for two months. MRI showed a lobulated cyst-like mass that was hypointense to muscle septation with a size of 14×12 mm. The patient underwent excision of the lesion, which was diagnosed as a periosteal ganglion cyst through imaging and confirmed by excision biopsy. Periosteal ganglions are benign cysts with a good prognosis, and they should be considered as a differential diagnosis when encountering pretibial soft tissue swelling.

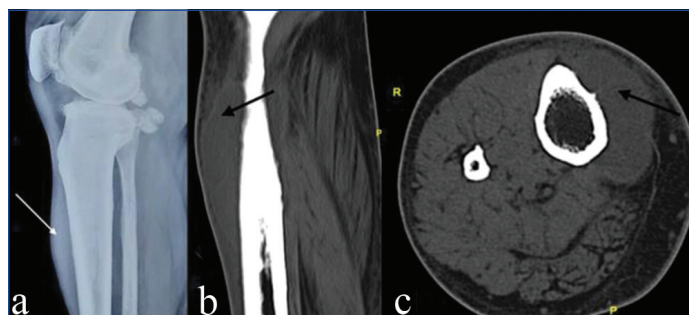
Keywords: Biopsy, Cystic lesion, Pretibial soft tissue, Tissue swelling

CASE REPORT

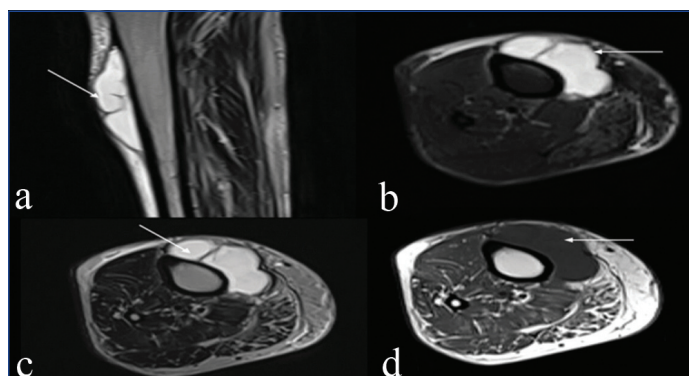
A 50-year-old female patient presented with spontaneous swelling and dull aching pain over the upper 1/3rd of the left leg for two months, with no history of trauma or surgery. On examination, the swelling was firm with mild tenderness, and no sinus opening or inflammatory changes in the overlying skin were observed. The patient had an unremarkable medical history, and no swelling at other sites was noted. Plain radiography of the left leg was advised, which revealed normal bony contour with soft tissue opacity anterior to the proximal 1/3rd of the tibia [Table/Fig-1a]. CT sections [Table/Fig-1b,c] were obtained to assess periosteal changes, which revealed mild irregularity beneath the lesion. MRI was done to characterise the lesion, which showed a well-defined, lobulated cystic lesion with hypointense septation within it. T1-weighted imaging revealed a lobulated cyst-like mass measuring 14×12 mm in size that is hypointense to muscle septation. T2-weighted and short TI inversion recovery imaging characteristically showed hyperintense signal. Normal marrow signal was noted in the adjacent tibia [Table/Fig-2]. Before excision, no tract or communication to the knee joint was observed, and there was no breach of the underlying cortex. The floor of the cyst was formed by roughened cortical bone, which was curetted. The patient underwent excision of the lesion [Table/Fig-3], which intraoperatively measured 24×18 mm. Features were suggestive of a Ganglion cyst, and on histopathological examination, the lesion had mucinous content consistent with the diagnosis of a benign ganglion cyst. It had an inner lining of pseudosynovial cells and an outer covering of fibrous tissue, consistent with the diagnosis of a benign ganglion cyst from periosteum [Table/Fig-4]. After a follow-up of three months, the patient had full range of movements without any pain.

DISCUSSION

Ganglions are mostly benign and fluid-filled sacs commonly found in the hand and wrist [1]. While they can arise from the proximal tibiofibular joint, they are much rarer with a prevalence of 0.76% [2] in this location. Ganglion cysts in the knee region are uncommon [3]. The lesion is produced by mucoid degeneration, and the cyst formed in the periosteum of long bones is called a periosteal ganglion cyst [4]. Histologically, they appear as translucent masses with a thin connective tissue capsule filled with mucinous material, giving

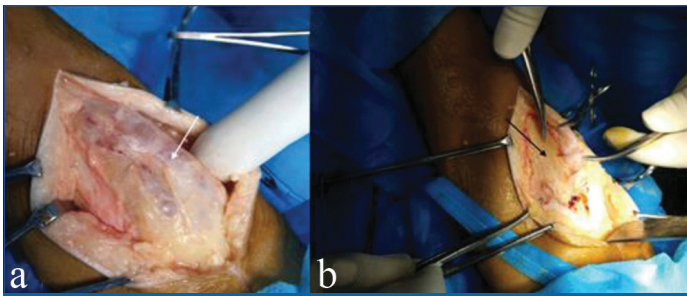


[Table/Fig-1]: a) Lateral radiograph of the left knee shows thick smooth periosteal reaction associated with a pretibial soft tissue lesion with tapering smooth superior margin (white arrow); b) Lobulated cystic lesion with no erosion of the underlying cortex. (Black arrow); c) Axial CT image of the tibia and fibula show an isodense cystic lesion arising from the antero-medial tibial periosteum with minimal scalloping of the underlying cortex without endosteal breach. There are no calcifications within the lesion (Arrows indicates isodense cystic lesion)

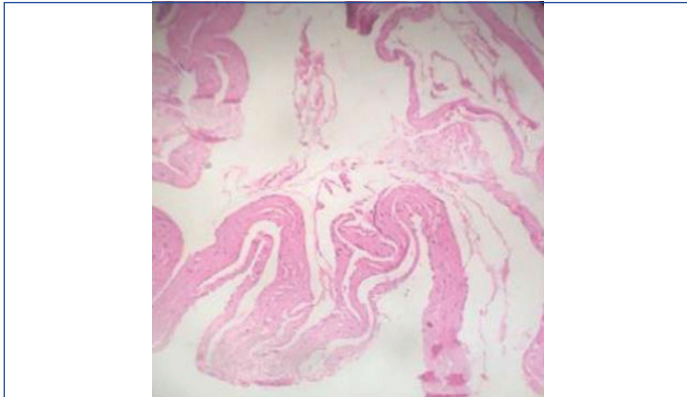


[Table/Fig-2]: Sagittal T2 weighted MRI image: (a) and axial fat suppressed, T2 and T1 weighted images; (b-d) of the mid leg reveal a well-defined, lobulated cystic lesion, with a hypointense septation within it. Normal marrow signal is seen in the adjacent tibia. Arrow highlights MRI images of lobulated cystic lesions.

rise to focal areas of chronic inflammation. Risk factors for ganglions include female gender and repeated traumatic exposure. They often appear as smooth lumps under the skin and are typically painless. However, in some cases, they can cause pain and discomfort. Common locations for these cysts include the long bones of the lower limb, particularly near the pes anserinus of the proximal tibia. Other locations include the distal end of the ulna, radius, femur, medial malleolus, and ilium [5,6].



[Table/Fig-3]: a) Intraoperatively, a lobulated cystic lesion arising from the periosteum of the left tibia; b) Shows Postexcision image.



[Table/Fig-4]: Histopathology reveals pseudosynovial cells in cuboidal arrangement surrounding gelatinous mucin. (Haematoxylin eosin staining, x400).

The usual presentation of ganglions includes swelling, diffuse tenderness, and occasional derangement of the joint. Rare presentations occur in ganglions associated with major vessels and nerves. In such cases, a major vessel may bleed into the ganglion, causing them to become hot, swollen, red, and painful [7].

MRI is the preferred diagnostic test for ganglion cysts when surgical planning is required. Radiographically, the majority of the lesions present as soft tissue masses associated with periosteal reaction and external scalloping. Sonography is also a useful modality in assessing juxtacortical soft tissue mass lesions and demonstrating the lesion's nature, which helps in excluding other differentials. Periosteal ganglions present as anechoic collections, occasionally with a few thin internal septations. Long-standing lesions may be complicated by hemorrhage or infection.

In our case report, MRI showed a well-defined, lobulated, cystic hyperintense lesion with septations suggestive of a periosteal ganglion cyst. CT imaging showed mild irregularity beneath the lesion. The lobulated cyst-like mass was hypointense to muscle septation on T1-weighted imaging. T2-weighted and STIR images characteristically showed high signal intensity. Similar imaging findings were observed in a study by Reghunath A et al. In that study, a patient presented with a tender swelling on the mid-shaft of the left tibia, which radiologically suggested a juxtacortical lesion extending to the soft tissue or a soft tissue neoplasm eroding the bony cortex of the tibia. It was later diagnosed definitively as a periosteal ganglion in an atypical location. Rim enhancement may be seen following contrast administration [4].

One case report presented a 50-year-old woman with a swelling over the fibular head diagnosed as a ganglion cyst on imaging. This produced peroneal nerve palsy, which was relieved following surgical removal of the cyst [8]. Another case report presented a 50-year-old male with acute foot drop, reporting a compressive ganglion cyst affecting the peroneal nerve [9].

Another report presented a case of a 68-year-old female with progressive swelling in the left antero-lateral leg with pain and neurological symptoms. MRI revealed a large proximal tibiofibular joint ganglion cyst causing peroneal nerve compression. After a

one-year follow-up, the patient presented with similar but less severe symptoms in her right antero-lateral leg. MRI reported a small juxta-articular ganglion cyst in the right proximal tibiofibular joint space [10].

Vora PH et al., reported a case of a 35-year-old male with gradual onset, poorly localized pain behind the left knee, which was radiologically suggestive of a periosteal ganglion, eroding the posterior aspect of the femur [11].

Mayer SL et al., reported a patient, a 61-year-old male, whose MRI of the left leg showed a complex intraneural ganglion cyst arising from the tibiofibular joint and ascending into the tibial nerve. He underwent indirect decompression through joint resection [12].

Kim D et al., reported a case of a 30-year-old patient who presented with foot drop due to a subparaneural ganglion cyst. MRI of the left knee showed a long segmental, high signal intensity lesion on T2-weighted image along the course of the distal common peroneal and proximal deep peroneal nerve. The mucous content of the ganglion was typically found to be located within the subparaneural compartment [13].

Although periosteal ganglion cysts are rare, it is important to differentiate them from other pretibial masses to determine the proper management. These other masses may include nodular pretibial myxedema, subcutaneous sarcoidosis, subperiosteal abscess or hematoma, parosteal lipoma, periosteal aneurysmal bone cyst, periosteal chondroma, and hydatid bone cyst [14]. These lesions have distinct morphological imaging features and specific clinical histories that can aid in distinguishing them from pretibial ganglion cysts.

Histopathological examination of pretibial ganglion cysts typically reveals a cyst that is continuous with the periosteum, containing myxoid material surrounded by fibrous tissue, and with an inner layer composed of flattened cells resembling synovium, referred to as pseudosynovial cells [4].

CONCLUSION(S)

Periosteal ganglions are benign cysts with a really good prognosis, and they should be considered as a differential when encountered with a pretibial soft tissue swelling. Treatment options include excision with adjacent bony cortex and aspiration, with or without injection of steroids.

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PARTICULARS OF CONTRIBUTORS:

1. Postgraduate, Department of Radiology, JJMMC, Devangere, Karnataka.
2. Assistant Professor, Department of Radiology, Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India.
3. Assistant Professor, Department of Radiology, Rajiv Gandhi Institute of Medical Sciences (RIMS), Ongole, Prakasam District, Andhra Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Venkatesh Manchikanti,
Assistant Professor, Department of Radiology, Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India.
E-mail: drvenki143@gmail.com

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