

Case Report

## Recurrence of a Periosteal Ganglion in the Tibia 反覆復發的脛骨骨膜囊腫



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### ABSTRACT

Periosteal ganglion is a rare type of ganglia most commonly located in the tibia. The clinical outcomes after surgical excision have not been documented in literature. We report a case of a periosteal ganglion in the proximal tibia with repeated recurrences despite surgical excisions. Magnetic resonance imaging (MRI), contrast arthrogram, and arthroscopy may have their values, especially for the detection of intra-articular communication in juxta-articular lesions.

### 中文摘要

骨膜的囊腫(水瘤)是罕見的囊腫類型，最常發病於脛骨。手術切除後的臨床療效尚未有文獻記載。我們報告一個近端脛骨骨膜的囊腫病例，儘管經多次手術切除仍然反覆復發。核磁共振掃描，對比關節造影和關節內鏡可能有它們的用處，特別在檢測近關節病變與關節的穿孔相通。

### Introduction

Ganglia are one of the most common benign tumours encountered by orthopaedic surgeons. They are cystic structures containing gelatinous fluid with a largely unknown and debated aetiology. Periosteal ganglion is a rare and sparsely reported type of ganglion located in the subperiosteal region. Initially, coined periotitis albuminosa,<sup>1</sup> they were mostly confirmed histologically although differentiating clues from radiological images were reported. We report a case of periosteal ganglion located at the proximal left tibia with repeated recurrences despite surgical excisions.

### Case Report

A 55-year-old gentleman presented with an insidious onset of left leg pain for several years. Physical examination revealed a 2-cm, firm, mildly tender, trans-illuminant, and hemispherical cystic lesion located at the posterior-medial border of the proximal third of his left tibia. The radiographs hardly revealed a soft tissue shadow and minimal cortical erosion (Figure 1). Bedside aspiration yielded gelatinous material. Following the aspiration, the pain disappeared along with the mass. However, it reappeared along with the recurrence of the mass during follow-up 3 months later.

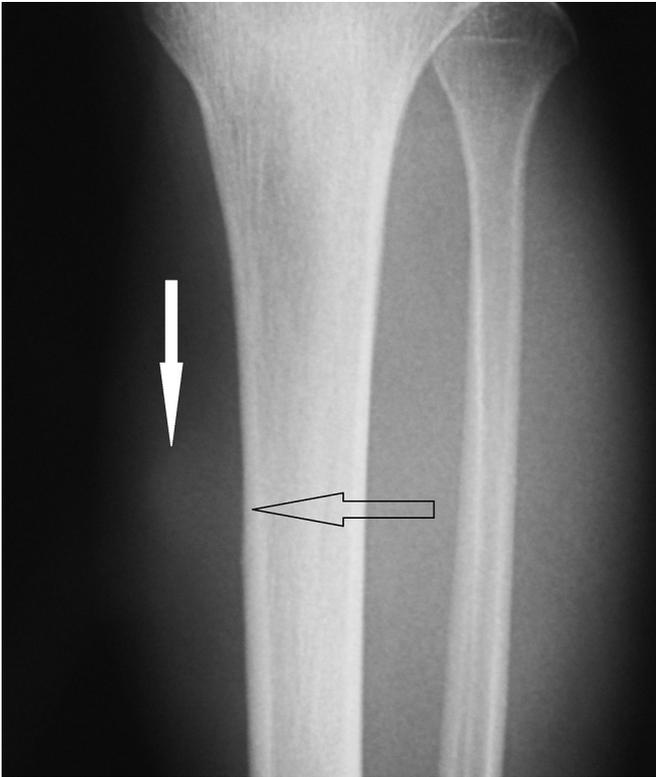
He did not have any knee symptoms. The examination showed a normal knee joint with a full and pain-free range of motion.

Surgical excision of the mass was performed under general anaesthesia. A longitudinal skin incision was made directly over the mass, which was located beneath the tibial periosteum and eroded the outer cortex. The entire lesion was excised subperiosteally. The diagnosis of a ganglion cyst was confirmed histologically. The patient's symptoms fully subsided after the operation.

However, the ganglion recurred 6 months after the first operation. Further investigations including ultrasound and magnetic resonance imaging (MRI) were arranged. Ultrasound revealed a well-defined cystic lesion with normal vascularity whereas the MRI demonstrated a well circumscribed, uniloculated lesion (hyperintense on T2, hypointense on T1) with erosion of the outer cortex but an intact endosteum (Figure 2). There was no communication with the knee joint or specific regional tissue extension detected on the MRI. The patient initially opted for conservative treatment, but decided to have a second operative excision later because it progressively enlarged to about 3 cm in size over 2 years.

A second excision under general anaesthesia was performed with the findings consistent with the first operation, namely, a well-defined subperiosteal ganglion at the posteromedial border of the left proximal tibia. There was no visible communication with adjacent structures intraoperatively. Complete excision was achieved, but the mass recurred again over the superior aspect of the

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**Figure 1.** A soft tissue shadow shown by the white arrow and the cortical erosion shown by the black arrow.

surgical scar (Figure 3) 6 months later. The patient then refused further intervention.

**Discussion**

Periosteal ganglia are a rarity. The literature search revealed sparse publications of scattered case reports or small retrospective

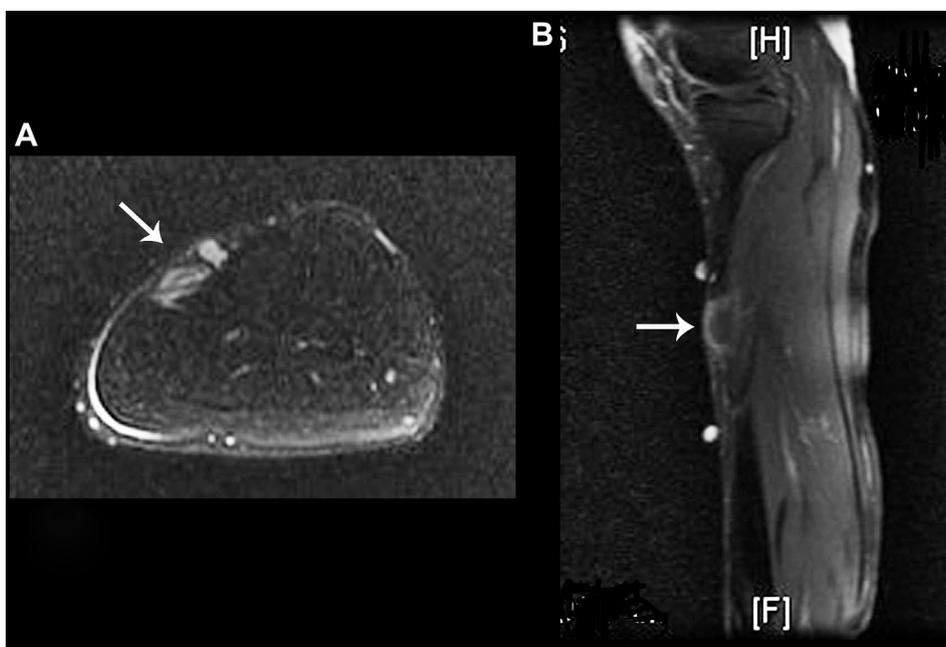


**Figure 3.** The recurrent mass located at the proximal part of the surgical scar.

case series. Its nomenclature has not yet been standardized with some reported as periostitis aluminosa,<sup>1</sup> periosteal or subperiosteal ganglia, and others classified it into the spectrum of intra-osseous ganglia.

Although the exact aetiology and pathophysiology were poorly understood, it was generally accepted that some form of mucoid degeneration of connective tissue was present. Some authors believed that they were originally an extra-osseous lesion that slowly migrated into the periosteal space whereas others believed the exact opposite evolution.<sup>2</sup>

Regardless of the aetiology, the reported clinical symptoms and signs were relatively homogeneous with an asymptomatic mass. Other presentations such as tarsal tunnel syndrome<sup>3</sup> or associations with other diseases, such as Paget’s disease of bone,<sup>4</sup> were reported. Our patient presented with a dull pain, which we believed to be due to the tension in the periosteum and the underlying bony erosion. The tibia was the commonest site involved



**Figure 2.** Magnetic resonance imaging (MRI) after the first recurrence shows the recurrent periosteal ganglion (arrow) at the proximal tibia. (A) Transverse view; (B) sagittal view.

and other long bones were also reported.<sup>5</sup> There were no reports of periosteal ganglia arising from the axial skeleton or flat bones.

The indications for surgery were not well defined. Most authors approached the periosteal ganglia in a manner akin to their approach to the wrist ganglia.<sup>6,7</sup> The indications for surgery in our case were relief of his left tibial pain, improvement of overall cosmetic appearance, and histological confirmation.

An MRI would delineate more features of a periosteal ganglion including a well circumscribed border, a cystic fluid filled mass, external cortical erosion and scalloping, as well as an intact endosteum.<sup>4,5</sup> Our MRI prior to the second operation did not reveal any communication between the recurred ganglion and the knee joint although the possibility of the presence of a tiny communicating stalk could not be fully excluded.

Some authors advocated the additional usage of delayed contrast imaging with either X-rays or computer tomography, which might show a previously unidentified communication with the adjacent articular surface.<sup>8,9</sup> A combined cystogram and arthrogram as described for wrist ganglia might also be useful to delineate articular communication and identify the presence of one-way valves.<sup>10</sup>

In addition, knee arthroscopy during the excision of the proximal tibial periosteal ganglion was advocated for both diagnostic and therapeutic purposes. The primary aim of arthroscopy was to look for a communicating stalk, which if found, should be resected or sealed to reduce the probability of recurrence.<sup>7–9,11</sup>

Recurrence rates after excision of a periosteal ganglion following different management strategies have never been reported, thus we can only borrow the statistics of the surgical outcomes of common wrist ganglia.<sup>6</sup> The causes of repeated recurrence in our patient might be due to an occult communicating stalk with the knee joint or unidentified tissues of origin. As stated above,

additional imaging studies such as the delayed contrast arthrogram in addition to the knee arthroscopy may decrease the chance of recurrence.

There are insufficient data in the literature to conclude a gold standard management regime for periosteal ganglia. The authors believe that MRI is a useful diagnostic tool. If surgical excision is chosen, additional knee arthroscopy should be performed for both the diagnosis and treatment of the articular communication. Other adjunct radiology such as the contrast arthrogram with delayed contrast imaging is also a commendable investigation.

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