

# Peroneal intraneural ganglion cyst



## Videos

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## Epidemiology

An [intraneural ganglion cyst](#) is an uncommon occurrence of the peripheral nerves. The most common type is the [peroneal intraneural ganglion cyst](#). Other reported sites of involvement are the radial, ulnar, median, sciatic, tibial, and posterior interosseus nerves. The first case of intraneural ganglion cyst of the tibial nerve was described in 1967.

## Etiology

The etiology of intraneural ganglion cysts has been controversial. In recent years, substantial evidence has been presented to support the articular (synovial) theory for their pathogenesis. The authors sought to 1) perform a systematic review of the world's literature on intraneural cysts, and 2) reinterpret available published MR images in articles by other authors to identify unrecognized joint connections. METHODS In Part 1, all cases were analyzed for demographic data, duration of symptoms, the presence of a history of trauma, whether electromyography or nerve conduction studies were performed, the type of imaging, surgical treatment, presence of a joint connection, intraneural cyst recurrence, and postoperative imaging. Two univariate analyses were completed: 1) to compare the proportion of intraneural ganglion cyst publications per decade and 2) to assess the number of recurrences from 1914 to 2003 compared with the years 2004-2015. Three multivariate regression models were used to identify risk factors for intraneural cyst recurrence. In Part 2, the authors analyzed all available published MR images and obtained MR images from selected cases in which joint connections were not identified by the original authors, specifically looking for unrecognized joint connections. Two univariate analyses were done: 1) to determine a possible association between the identification of a joint connection and obtaining an MRI and 2) to assess the number of joint connections reported from 1914 to 2003 compared with 2004 to 2015. RESULTS In Part 1, 417 articles (645 patients) were selected for analysis. Joint connections were identified in 313 intraneural cysts (48%). Both intraneural ganglion cyst cases and cyst recurrences were more

frequently reported since 2004 (statistically significant difference for both). There was a statistically significant association between cyst recurrence and percutaneous aspiration as well as failure to disconnect the articular branch or address the joint. In Part 2, the authors identified 43 examples of joint connections that initially went unrecognized: 27 based on their retrospective MR image reinterpretation of published cases and 16 of 16 cases from their sampling of original MR images from published cases. Overall, joint connections were more commonly found in patients who received an MRI examination and were more frequently reported during the years 2004 to 2015 (statistically significant difference for both). **CONCLUSIONS** This comprehensive review of the world's literature and the MR images further supports the articular (synovial) theory and provides baseline data for future investigators <sup>1)</sup>.

In the case of the common peroneal nerve ganglion cyst, the joint involved is the superior tibiofibular joint.

Although the pathogenesis of these cysts has been the subject of controversy in the literature, it is becoming increasingly evident that they are of articular origin. Recent recognition of this fact has proven to be significant in reducing recurrences and improving treatment outcomes for patients <sup>2)</sup>.

## Clinical features

These lesions can present as a mass and/or with [neuropathy](#) symptoms.

## Diagnosis

### Radiographic features

With both imaging modalities look for signs of neuropathy (e.g. muscle atrophy) in the nerve's distribution.

### Ultrasound

Multiloculated fluid collection in intimate connection with the common peroneal nerve.

High-Resolution Ultrasound <sup>3)</sup>.

The benefits of US include portability, low cost, high spatial resolution, dynamic imaging, and ability to guide percutaneous interventions when indicated. US also allows direct patient contact, facilitating immediate clinical correlation and the ability to compare with the contralateral knee. US evaluation of the knee can be targeted to a specific region on the basis of the complaint or be a comprehensive review. For comprehensive evaluation, the knee is divided into anterior, medial, lateral, and posterior compartments for structured evaluation of the tendons, ligaments, joint space, osseous structures, as well as peripheral nerves and vasculature. US is particularly well suited for evaluating injuries of the quadriceps and patellar tendons, injuries of the medial and lateral collateral ligaments, joint effusions, and fluid collections around the knee. There is additional utility in evaluation of the distal hamstrings tendons, the iliotibial tract, the superficial patellar cortex, the common peroneal nerve, the popliteal

vessels, and juxta-articular cystic collections including Baker cyst. In-depth appreciation of relevant sonographic anatomy, common pathologic conditions, knowledge of important pitfalls, and mastery of US technique will allow one to effectively use this powerful bedside tool for the evaluation of a wide variety of knee disorders <sup>4)</sup>.

## MRI

T2 hyperintense lesion tracking along the course of the common peroneal nerve

Rarely, there is extension into the tibial nerve as well

On MR arthrography, fluid tracks from the adjacent joint to the nerve

## Differential diagnosis

The differential considerations for cystic intraneural lesions include cystic nerve sheath tumors, atypical Baker's cyst, and extraneural ganglion.

Cystic nerve sheath tumors such as schwannomas and extraneural ganglion can be differentiated from cystic intraneural lesions by MRI. A Baker's cyst classically is more mass-like, with a characteristic location extending from the tibiofemoral joint to within the confines of the medial head of the gastrocnemius and the muscles of the joint capsule <sup>5)</sup>.

## Case reports

Two patients with intraneural ganglion cysts of the tibial nerve were identified: an adult with an intraneural ganglion cyst of the tibial nerve at the tarsal tunnel and a child with an intraneural ganglion cyst of the tibial nerve at the knee. In each case, preoperative MR imaging demonstrated the intraneural cyst and its connection to the adjacent joint via the articular branch to the subtalar joint and superior tibiofibular joint. At surgery the articular branch was identified and resected, thus disconnecting the tibial nerve intraneural cyst from the joint of origin.

These cases detail the important features of intraneural ganglion cysts of the tibial nerve and document the clinical utility of incorporating the unifying (articular) theory for the surgical management of tibial intraneural ganglia in adults and children <sup>6)</sup>.

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A fifteen-year-old patient with an intraneural ganglion cyst of the common peroneal nerve, with paralysis of the anterior tibial muscles which was subacute in onset. The lesion was radically removed using microtechniques. Such a purely intraneural location has rarely been described. The use of the surgical microscope and pathological study of the peroneal articular branches allows one to reject the possible synovial origin of this lesion <sup>7)</sup>.

## References

1)

Desy NM, Wang H, Elshiekh MA, Tanaka S, Choi TW, Howe BM, Spinner RJ. Intraneural ganglion cysts: a systematic review and reinterpretation of the world's literature. J Neurosurg. 2016 Sep;125(3):615-30. doi: 10.3171/2015.9.JNS141368. Epub 2016 Jan 22. Review. PubMed PMID: 26799306.

2)

Spinner RJ, Desy NM, Rock MG, Amrami KK. Peroneal intraneural ganglia. Part I. Techniques for successful diagnosis and treatment. Neurosurg Focus. 2007 Jun 15;22(6):E16. Review. PubMed PMID: 17613207.

3)

Nitsch L, Kurzwelly D, Kornblum C, Pieper C, Clusmann H, Müller M. High-Resolution Ultrasound as a Powerful Diagnostic Tool in Peripheral Nerve Lesions: Detection of an Intraneural Ganglion Cyst in a Patient with Painful Subacute Peroneal Nerve Palsy. Ultraschall Med. 2019 Sep 2. doi: 10.1055/a-0990-9989. [Epub ahead of print] PubMed PMID: 31476785.

4)

Alves TI, Girish G, Kalume Brigido M, Jacobson JA. US of the Knee: Scanning Techniques, Pitfalls, and Pathologic Conditions. Radiographics. 2016 Oct;36(6):1759-1775. Review. PubMed PMID: 27726755.

5)

Patel P, Schucany WG. A rare case of intraneural ganglion cyst involving the tibial nerve. Proc (Bayl Univ Med Cent). 2012 Apr;25(2):132-5. PubMed PMID: 22481843; PubMed Central PMCID: PMC3310510.

6)

Davis GA, Cox IH. Tibial intraneural ganglia at the ankle and knee: incorporating the unified (articular) theory in adults and children. J Neurosurg. 2011 Jan;114(1):236-9. doi: 10.3171/2010.3.JNS10427. Epub 2010 Apr 23. PubMed PMID: 20415523.

7)

Eiras J, Garcia Cosamalón PJ. Intraneural ganglion of the common peroneal nerve. Neurochirurgia (Stuttg). 1979 Jul;22(4):145-50. PubMed PMID: 228214.

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