

Intraneural ganglion cyst

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An intraneural ganglion cyst (INGC) is a non-neoplastic mucinous cyst within the [epineurium](#) of a nerve and commences from an adjoining joint ^{1) 2) 3) 4) 5) 6) 7)}.

These cysts are filled with a mucinous material which is walled off by a fibrous layer ^{8) 9) 10)}

An [intraneural ganglion](#) cyst is an uncommon occurrence of the [peripheral nerves](#).

Types

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.

see [Femoral intraneural ganglion cyst](#)

Etiology

The pathogenesis of intraneural ganglia has been an issue of curiosity, controversy, and contention for 200 years. Three major theories have been proposed to explain their existence, namely, 1) degenerative, 2) synovial (articular), and 3) tumoral theories, each of which only partially explains the observations made by a number of investigators. As a result, differing operative strategies have been described; these generally meet with incomplete neurological recoveries and high rates of recurrence. Recent advances in magnetic resonance imaging and critical analysis of the literature have clarified the mechanisms underlying the formation and propagation of these cysts, thereby confirming the unifying articular (synovial) theory. By identifying the shared features of the typical cases and explaining atypical examples or clinical outliers, several fundamental principles have been described. These include: 1) a joint origin; 2) dissection of fluid from that joint along an articular nerve branch, extension occurring via a path of least resistance; and 3) cyst size, extent, and directionality being influenced by pressures and pressure fluxes. We believe that understanding the pathogenesis of these cysts will be reflected in optimal surgical approaches, improved outcomes, and decreased frequency, if not elimination, of recurrences. This article describes the ongoing process of critically analyzing and challenging previous observations and evidence in an effort to prove a concept and a theory ¹¹⁾.

According to the most widely accepted theory (articular/synovial theory), the cysts are formed from a capsular defect of an adjacent joint, so that synovial fluid spreads along the epineurium of a nerve branch ¹²⁾.

Clinical features

As these cysts expand within the epineurium, they displace and compress the adjacent nerve fascicles leading to pain, paresthesia, tingling and muscle paralysis in the distribution of the involved nerve ^{13) 14)}.

Diagnosis

MRI is the method of choice for diagnosing intraneural ganglion cysts. However, ultrasound is also important ¹⁵⁾.

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 ¹⁶⁾.

Treatment

Surgery is the only curative treatment with treatment success being dependent on ligation of the nerve endings supplying the articular branch ¹⁷⁾.

Case series

Fricke et al. from [Kiel](#), examined between 2011 and 2018 the patients using [lower limb MRI](#). MRI scans were also performed for the follow-up examinations.

The patients had many symptoms. They were able to accurately detect the intraneural ganglion cysts on MRI and provide the treating surgeons with the basis for the operation to be performed.

The success of surgical therapy depends on the resection of the nerve endings supplying the joint as the only way to treat the origin of the disease and prevent recurrence. Based on there case studies, they can support the commonly favored articular/synovial theory. ¹⁸⁾.

References

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Patel P, Schucany WG. A rare case of intraneural ganglion cyst involving the tibial nerve. Proc (Bayl Univ Med Cent) 2012;25:132-135.

2) 9)

Uetani M, Hashmi R, Hayashi K, Nagatani Y, Narabayashi Y, Imamura K. Peripheral nerve intraneural ganglion cyst: MR findings in three cases. J Comput Assist Tomogr. 1998;22:629-632.

3) 10)

Harbaugh KS, Tiel RL, Kline DG. Ganglion cyst involvement of peripheral nerves. J Neurosurg. 1997;87:403-408.

4)

Spinner RJ, Desy NM, Rock MG, Amrami KK. Peroneal intraneural ganglia. Part I. Techniques for successful diagnosis and treatment. Neurosurg Focus. 2007;22:E16.

5)

Jacobs RR, Maxwell JA, Kepes J. Ganglia of the nerve. Presentation of two unusual cases, a review of the literature, and a discussion of pathogenesis. Clin Orthop Relat Res. 1975:135-144.

6)

Adn M, Hamlat A, Morandi X, Guegan Y. Intraneural ganglion cyst of the tibial nerve. Acta Neurochir (Wien) 2006;148:885-889; discussion 889-890.

7)

Johnston JA, Lyne DE. Intraneural ganglion cyst of the peroneal nerve in a four-year-old girl: a case report. J Pediatr Orthop. 2007;27:944-946.

11)

Spinner RJ, Scheithauer BW, Amrami KK. The unifying articular (synovial) origin of intraneural ganglia: evolution-revelation-revolution. Neurosurgery. 2009 Oct;65(4 Suppl):A115-24. doi: 10.1227/01.NEU.0000346259.84604.D4. PMID: 19927056.

12) 15) 17) 18)

Fricke T, Schmitt AD, Jansen O. Intraneural ganglion cysts of the lower limb. Rofo. 2018 Nov 19. doi: 10.1055/a-0777-2525. [Epub ahead of print] English, German. PubMed PMID: 30453381.

13)

Tehli O, Celikmez RC, Birgili B, Solmaz I, Celik E. Pure peroneal intraneural ganglion cyst ascending along the sciatic nerve. Turk Neurosurg. 2011;21:254-258.

14)

Liang T, Panu A, Crowther S, Low G, Lambert R. Ultrasound-guided aspiration and injection of an intraneural ganglion cyst of the common peroneal nerve. HSS J. 2013;9:270-274.

16)

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.

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