



Case report

PAINFUL ANTERIOR KNEE SCHWANNOMA: A CASE REPORT

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ABSTRACT

Tumors of the peripheral nervous system are classified according to the specific origin of cell differentiation. Schwannomas (neurilemmomas) are benign nerve sheath tumors slowly growing, often solitary, arising from the nerves' Schwann cells that are not generally associated with malignant degeneration. The cause is unknown. The authors present a case of a 37-year-old woman with a lump formation located at the anterior aspect of the knee joint, inducing a burning-like sensation around the knee and up the whole hip. The pain increased through motion of the knee joint and during palpation. Prior to these complaints, the patient does not recall any trauma or degenerative knee conditions.

Keywords: peripheral nerve system tumors, Schwann cells, hypersensitivity, paresthesia neoplasm, neurilemmoma,

BACKGROUND

The most common type of peripheral nerve tumors are neurilemmomas. These tumors are usually benign, encapsulated formations composed of neoplastic Schwann cells. Due to their slow growth, they can be asymptomatic for many years. There is no gender or race predilection, and usually, Schwannomas affect all ages, with a peak incidence between 20-50 years [1]. Cases of cranial and spinal localizations have also been described in the literature [2]. Schwannomas of the peripheral nerves usually present as a painful mass with hypersensitivity, paresthesias or weakness [3]. Usually, the Tinel sign is positive. MRI is the most beneficial in aid of diagnosing, demonstrating the mass arising from the peripheral nerve or only soft tissue mass. The cause is unknown. Most occur spontaneously, while some develop in association with genetic disorders such as neurofibromatosis type 2. Histological studies show that the lesions are composed of Antoni A and B areas [4]. Antoni A areas demonstrate compact spindle cells, twisted nuclei, indistinct cy-

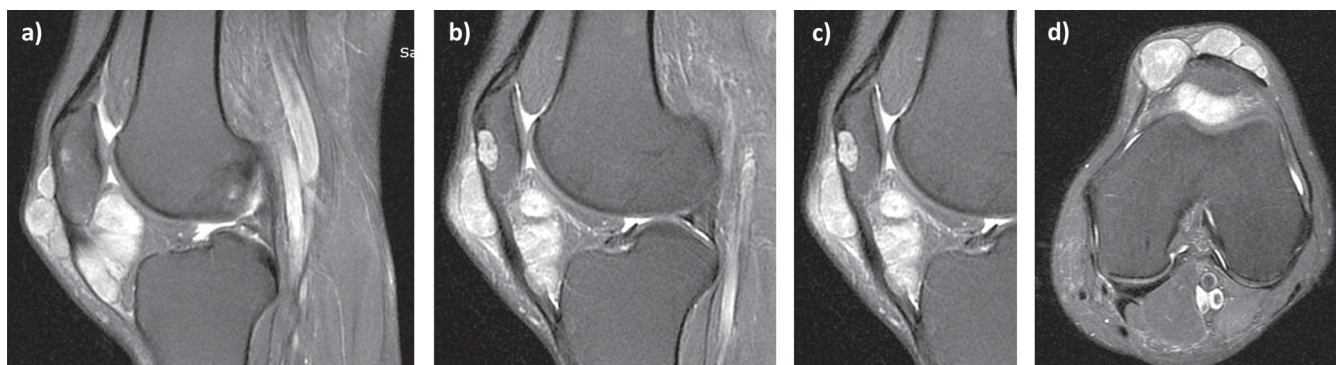
toplasm, intranuclear vacuoles with palisading and Verocay bodies. Antoni B areas show cells that are less orderly and in a loosely arranged matrix. Immunohistochemical studies demonstrate a strong reactivity of schwannomas for S-100 protein [4]. Treatment depends on localization, size of the tumor and severity of the symptoms.

CASE DESCRIPTION

A 37-year-old woman presented at our department with complaints of insidious onset of pain over the anterior aspect of the left knee joint with a slowly growing palpable mass, causing a burning or electricity type sensation over the knee and up the whole hip on palpation. The patient denied any recollection of trauma leading up to the start of the symptoms. According to the patient, twelve years ago, surgery in the same area of the left knee joint was performed for a small cyst, but no medical documentation was provided, nor was a biopsy conducted.

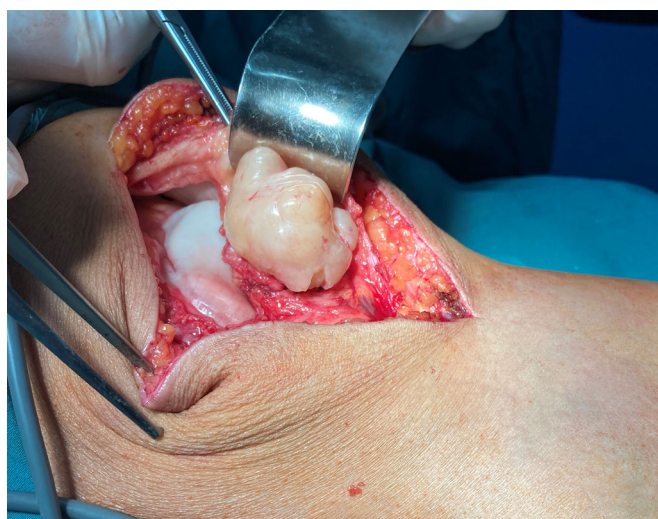
Physical examination was difficult to be performed due to the hypersensitivity of the skin. The knee joint had a limited range of motion due to an enlarged palpable rounded mass at the anterior aspect, which caused pain and tingling sensation around the knee joint and irradiated up the hip. No knee joint effusion was present, and quadriceps atrophy was encountered. Echography showed several encapsulated well-circumscribed formations, displacing the adjacent soft tissues without signs of any direct invasion or cystic or hemorrhagic degeneration and calcification. Radiographs were obtained but did not show any specific changes around the knee joint. MRI studies had a crucial role in determining the final diagnosis and showed an image of grouped intra-, and extracapsular cysts located supra and infrapatellarly beneath ligamentum patellae proprium, with dimensions from 12 to 38 mm. There was a cyst lesion in the patella with a diameter of 13 mm. A surgical biopsy was recommended in order to exclude a malignant neoplastic process (Fig.1 a, b, c, d).

Fig. 1 a, b, c, d. MRI images of knee schwannoma in different planes (**a, b** – sagittal, **c** – coronal, **d** - axial)



Surgery was performed through a longitudinal skin incision of about 10 cm. In the subcutaneous tissue, two formations with a diameter 1,5 x 1cm were localized and excised. The joint capsule of the knee and medial retinaculum were perforated in several places with the encapsulated masses. This decision for intraarticular examination was taken. A minimally invasive standard medial parapatellar approach to the knee joint was utilized. There were several lesions located in the anterior knee compartment around Hoffa's fat pad beneath the patellar tendon. These formations were solitary well-defined, encapsulated mass with a grey-yellowish color. The biggest formation was 3,8 cm./2,5 cm. in its largest diameter (Fig. 2).

Fig. 2. Intraoperative look of the tumor formation in the anterior knee compartment.

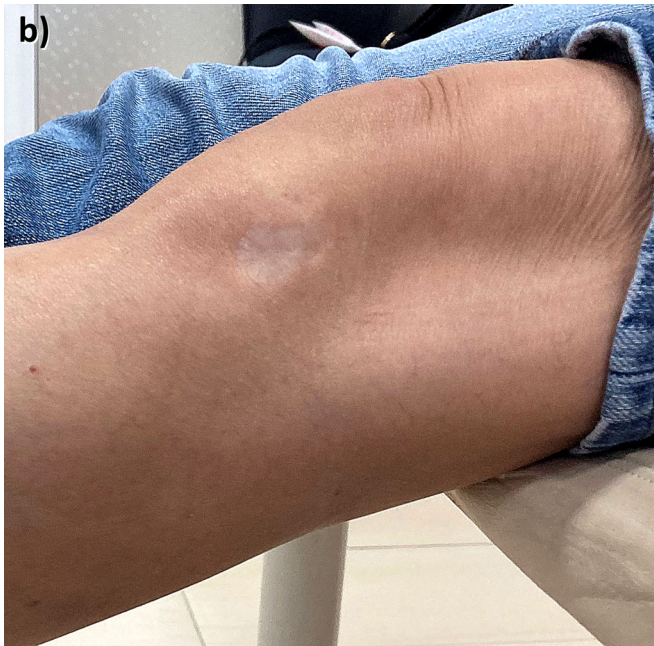


After detailed hemostasis and removal of all tumor masses, careful irrigation and lavage were performed. The excised material was placed in containers with 10% of formalin and set for the pathohistological examination. Due to the spread of the lesions, it was difficult to assure whether these tumor formations arise from the inferior medial genicular nerve (branch of the tibial nerve), inferior lateral genicular nerve (branches of the common peroneal nerve) or branches of the saphenous nerve. Macroscopically, the tumors appeared encapsulated, shiny, and yellow. The excised lesions were sent for histopathologic test-

ing with immunohistochemistry (IHC) which showed diffuse intensive S100 (+) protein positive expression on the surface of the tumor cells. The histological diagnosis was benign schwannoma. The patient was discharged on the 3rd postoperative day, broad-spectrum antibiotics and pain-killers were prescribed. The patient was symptom free, with no pain or sensory disturbances within two months after surgery. The follow-up period was 12 months and no signs of relapse of symptoms were exhibited by the patient. The normal range of motion of the knee joint was recovered entirely, and the patient returned to regular daily activities (Fig. 3 a, b, c).

Fig. 3 a, b, c. Surgical approach and postoperative range of motion (**a** – surgical approach, **b** – full knee extension, **c** – full knee flexion)





DISCUSSION

We presented a case of an enlarging anterior left knee formation associated with intermittent, sometimes burning pain intensifying on palpation or pressure and paresthesias. Differential diagnosing should include: anterior knee pain, plica syndrome, meniscal tear, collateral

ligament injury, patellofemoral pain, Hoffa's fat pad syndrome, all excluded when thorough clinical examination took place combined with the appropriate usage of MRI. Schwannomas can occur anywhere in the body. They are a rare form of neoplasms of the peripheral nervous system with an even rarer malignant degeneration [5]. Affected areas could be the head and flexor surfaces of the upper and lower extremities and the trunk. Kim et al. reported that schwannomas are most often located in the brachial plexus (39%), followed by a slight predominance in the upper limbs (30%) compared with their appearance in the lower extremities (24%) [6]. Most neurilemmomas are asymptomatic, it may become symptomatic after many months or years. They are usually capsulated, solitary masses that do not interfere with the affected nerve's function and only cause impairment to the surrounding soft tissues due to pressing. Pain, irradiating tingling sensation (Tinel sign) and a tumor mass are the most common presentations. CT and MRI are the imaging modalities of choice being the most informative to tumor topography and anatomy. Surgical excision is curative for the condition, and further histopathologic testing with IHC proves the diagnosis.

Several clinical studies of schwannomas have been rarely reported in the literature, the cause is still unknown, with the exception of cases linked to genetic disorders [7]. Localization around the knee joint is even more rare [8]. One previous study focuses on the misdiagnosis of meniscal tear instead of saphenous nerve schwannoma [9]. Another case with anterior knee pain was associated with schwannoma localized in the Hunter canal of the femur [10]. Our patient had several formations within intra- and extraarticular localizations and even with penetration into the patella, which made it impossible to determine for sure the exact origin, namely which nerve branch was affected.

CONCLUSION:

Few cases with anterior knee schwannoma have been described so far in the literature. Despite its low frequency of manifestation and rare localization around the knee joint, clinicians should be aware of the clinical symptoms and the possibility of misdiagnosis with the common anterior knee pain. Detailed analysis of the clinical symptoms and the MRI examination is vital.

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