International Journal of Orthopaedics Sciences

**ISSN:** 2395-1958
IJOS 2018; 4(1): 599-602

www.orthopaper.com
Received: 06-11-2017
Accepted: 07-12-2017

**Dr. Siddaram N Patil**
Professor, Department of Orthopaedics, Sri Devraj Urs Medical College, Tamaka. Kolar. Karnataka. SDUAHER, Tamaka. Kolar, Karnataka, India

**Dr. Uthkarsh**
Post-Graduate, Department of Orthopaedics, Sri Devraj Urs Medical College, Tamaka. Kolar. Karnataka. SDUAHER, Tamaka. Kolar, Karnataka, India

**Correspondence**
**Dr. Siddaram N Patil**
Professor, Department of Orthopaedics, Sri Devraj Urs Medical College, Tamaka. Kolar. Karnataka. SDUAHER, Tamaka. Kolar, Karnataka, India

# Schwannoma of the tendon sheath of biceps femoris in 20 year old male: A rare case report

**Dr. Siddaram N Patil and Dr. Uthkarsh**

**DOI:** https://doi.org/10.22271/ortho.2018.v4.i1i.86

**Abstract**
Schwannomas are benign tumors arising from the peripheral nerves with a Schwann cell sheath. Schwannomas can be found in almost every region, but are usually associated with cranial, spinal, sympathetic and peripheral nerves. Schwannoma in lower extremity is relatively common and most are associated with sciatic nerve, peroneal nerve and tibial nerve. However, schwannoma arising in the tendon or paratenon is extremely rare. We report a rare case of a 20-year-old male patient with a schwannoma originating from the paratenon of Biceps Femoris muscle tendon sheath, with pain on stretching of leg without evidences of any neurologic symptoms. The clinical history, plain radiographs, UltraSono-Graphy, Magnetic Resonance Imaging, and pathologic findings of the reported patient have been reviewed. The tumor was fully excised by dissecting from the tendon sheath of Biceps Femoris Muscle.

**Keywords:** Schwannoma; Peripheral nerve sheath tumor, biceps femoris muscle tendon sheath

## Introduction
Schwannoma (shwah-nō'mă), A benign, encapsulated neoplasm in which the fundamental component is structurally identical to the syncytium of Schwann cells; the neoplastic cells proliferate within the endoneurium, and the perineurium forms the capsule. The neoplasm may originate from a peripheral or sympathetic nerve, or from various cranial nerves, particularly the eighth cranial nerve; when the nerve is small, it is usually found (if at all) in the capsule of the neoplasm; if the nerve is large, the schwannoma may develop within the sheath of the nerve, the fibers of which may then spread over the surface of the capsule as the neoplasm enlarges. Microscopically, schwannoma is composed of combinations of two patterns, Antoni types A and B, either of which may predominate in various examples of schwannomas.
Superficial lump in the posterior region of the knee is a common complaint. Common causes of such mass include lipoma, popliteal cyst or Baker's cyst. The incidence of schwannoma in lower extremities is relatively common and frequently found in the sciatic nerve, common peroneal nerve or posterior tibia nerve. However, it is uncommon in the tendon sheath of a muscle. There were two reports of a schwannoma aroused from the tendinous structure, such as tendon of flexor digitorum longus muscle or Achilles tendon [1] and [2]. We present the schwannoma arising from a tendon/paratenon of biceps femoris muscle tendon sheath at the distal thigh with pain on stretching of leg but no neurologic symptoms.

## A Case Report
A 20-year-old male presented with a 2-month history of palpable mass at the posterior aspect of the knee without any history of trauma. He complained of a growing mass at the posterior aspect of the distal thigh, just below the knee joint. The mass was rubbery hard and it was tender on rolling with finger and Tinel's sign was negative. There was no gross evidence of motor weakness, sensory loss of the lesion.

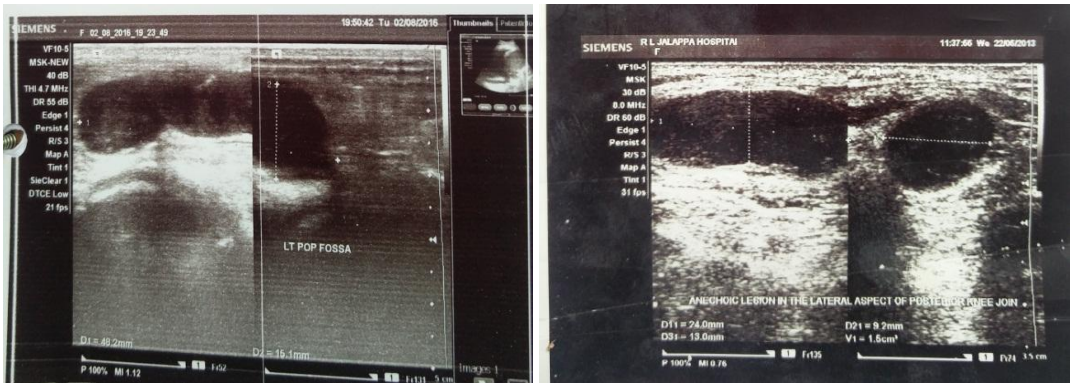


**Fig 1:** Ultrasound report: There is well defined lobulated echogenic lesion noted in posterior-lateral aspect of right knee in intramuscular plane with few internal septations and mild internal vascularity in colour Doppler.

Diagnostic imaging included plain radiograph and magnetic resonance images (MRI) of the patient's right knee. Routine radiography showed a subtle increase in soft tissue density on the lateral view of the knee. MRI demonstrated 4.6 × 1.7 × 1.8 mm (craniocaudal-anterioposterior-transverse) soft tissue mass located just deep into lateral head of gasronemious and biceps tendon muscle. There is another cystic lesion medial to popliteal vein in inter muscular plane measuring 16-5.5-7.0mm (craniocaudal-anterioposterior-transverse). The lesion displayed a well-demarcated oval shape, was lower signal intensity on T1-weighted image, and displayed heterogeneous high signal intensity on T2-weighted images

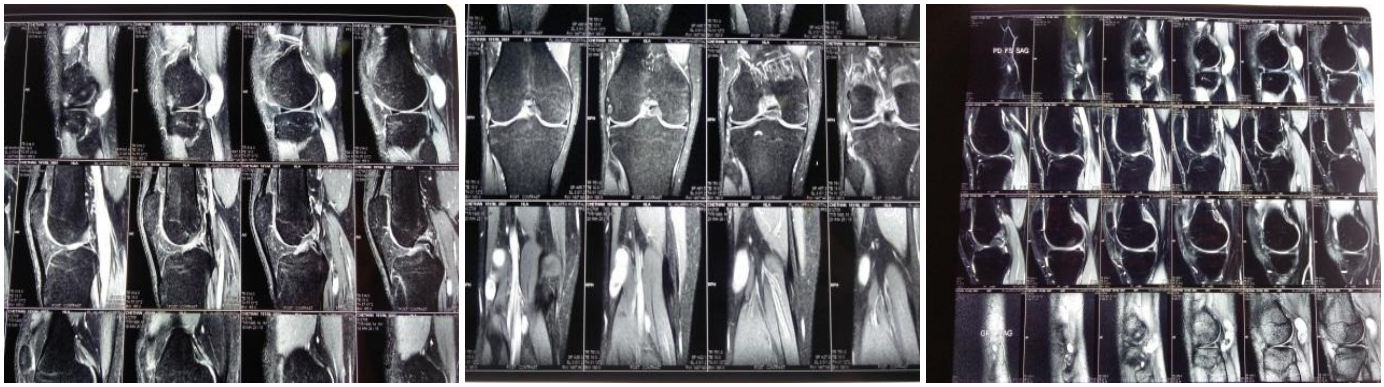

**Fig 2:** Magnetic resonance images of the knee. (a): axial T1- and T2-weighted images

Magnetic resonance images of the knee. (a): axial T1- and T2-weighted images showing location of the lesion; (b): coronal and sagittal T2-weighted image sequences with high signal intensity on peripheral rim with intermediate signal intensity at the center of the mass showing ‘target sign’.

A 8 cm over-the-top incision was made to posterolateral aspect of the knee. The tumor was located at the tendon of the biceps femoris muscle tendon sheath. The mass was adherent to tendon and subcutaneous tissue but was not attached to either. The nodule was firm, glistening in appearance, kidney shape and bluish to white in color measuring approximately 4 cm × 6 cm in size. It was well capsulated without adhesion to the surrounding soft tissue. The lesion was ‘shelled out’ or enucleated from the tendon sheath of the biceps femoris muscle (Fig. 2). Macroscopically speaking, there were no connections with nerve endings or nerve branches or main nerves. Postoperatively, there was no loss of sensitivity or muscle power.

**Fig 3:** Intraoperative picture showing the relation of the mass to the musculotendinous, Removed Mass., Cut section of Mass.

Intraoperative picture showing the relation of the mass to the musculotendinous junction of biceps femoris muscle tendon sheath.

The histological review demonstrated findings consistent with schwannoma, as well as histochemical staining consistent with the presence of the S-100 protein

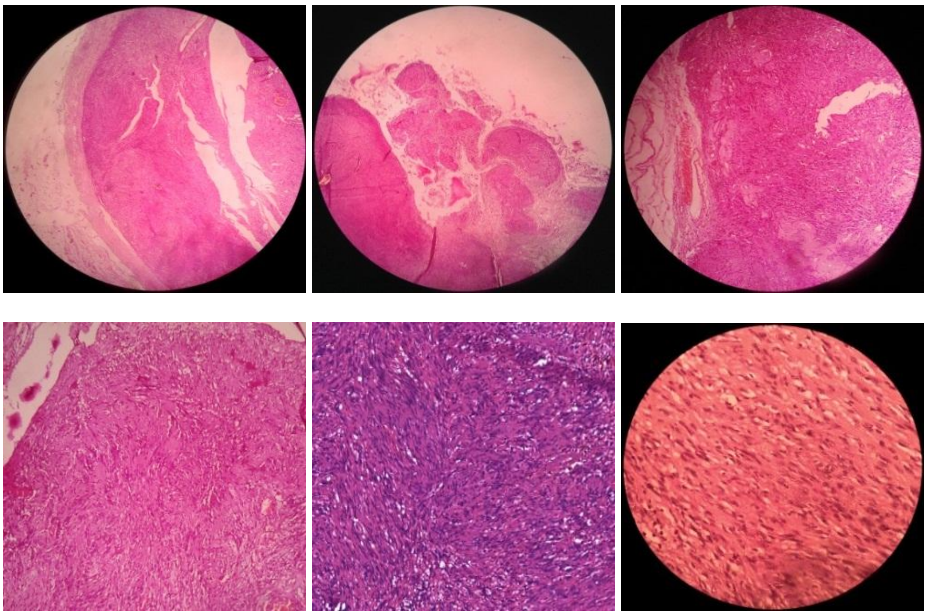

**Fig 4:** Microphotography of the neurilemoma. (A). Dense Antoni A and loose Antoni B

Microphotography of the neurilemoma. (A). Dense Antoni A and loose Antoni B areas (hematoxalyn and eosin × 100). (B). Positive S100 protein staining (hematoxalyn and eosin × 200). Approval and informed consent were received for this report from the patient.

**Discussion**

This location of schwannoma which arose at the paratenon of the Biceps Femoris Muscle Tendon Sheath, is extremely rare. Only two such cases that developed around the ankle joint have been reported in the literature [1, 2]. This is the report of schwannoma occurring at the paratenon of Biceps Femoris Muscle sheath without any neurologic symptoms. Which should be included in the differential diagnosis of a lump in the posterior aspect of the knee.

Liebau *et al*. [1] reported a schwannoma arising at the flexor digitorum longus muscle that was located between the tendon mirrors of the two muscles, which evoked pain and parathesias. Jack *et al*. [2] reported a case of multiple schwannomas arising at the medial aspect of Achilles tendon, which caused pain and positive Tinel's sign.

Schwannomas can develop anywhere in the body which are most prevalent in major nerve trunk or peripheral nerve at the upper extremities and lower extremities. Numerous previous reports of schwannoma localized to the region around the knee were schwannoma arising from peroneal nerve near the fibular head [3-5].

The clinical features of schwannoma in the limbs usually present as a pain, mobile, and Tinel's sign, in which percussion over the lump induces painful paresthesia, are common [3, 4]. However, our case had tenderness on deep palpation, no paresthesia, or Tinel's sign, but only palpable lump at the posterior aspect of the knee.

However, in our case, mass was located in the tendon/paratenon of the biceps femoris muscle tendon sheath with tenderness, on deep palpation, no paresthesia, and Tinel's sign, but only palpable lump. To our knowledge, tendon itself does not contain nerve fibers [6]. We made an assumption that the mass developed from Golgi tendon organ in musculo-tendinous junction or proprioceptive neural structures on the paratenon since there was no connection of any nerve fibers.

Intraoperative gross findings of schwannoma characteristically form an eccentric, oval shaped, less than 3 cm in diameter, with the attenuated nerve bundle of the parent nerve stretched and displaced over the mass. However, no connections to nerve fibers or nerve endings were found in the case presented in this report.

Histologically, the neoplasm is characterized by encapsulation, and is composed of Antoni A and B cells and Verocay bodies [3]. In the case described in this report,

histological evaluation was done with conventional hematoxalyn and eosin staining, and by means of immunostaining for the S100 protein to confirm the diagnosis (Fig. 3) [7, 8].

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