

## Case Report

# BILATERAL PRESENTATION OF TENSOR FASCIA SURALIS MUSCLE IN A MALE CADAVER

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## ABSTRACT

Tensor fascia suralis muscle is an anomalous muscle located in popliteal fossa. The muscle may arise from any of the hamstring muscles and is inserted into the crural fascia or tendoclacaneus. We found tensor fascia suralis muscle in a male cadaver taking origin from medial side of tendon of biceps femoris muscle. The tendinous origin was then transformed into a well defined fusiform belly in the roof of popliteal fossa. After traversing downwards and medially the muscle again became tendinous to get inserted into deep fascia of leg. Bilateral presentation of the anomalous muscle is not yet documented in literature.

The anatomical relation of the muscle explains its great clinical importance. The tendinous origin was anteriorly related to sciatic nerve and the muscle belly to the tibial nerve. Sural nerve and short saphenous vein were in lateral relation to the muscle. Contraction of muscle in the roof of popliteal fossa may lead to sciatic, tibial or sural nerve neuropathy. The muscle can confuse the physician of a soft tissue mass or an aberrant vessel. Hence, the bilateral presence of tensor fascia suralis muscle is documented for further references.

**Clinical Significance:** The precise knowledge of anatomy of popliteal region is mandatory for the surgeons to perform safe and uncomplicated surgery in and around popliteal fossa and also for radiologist for correct radiographic interpretations.

**KEYWORDS:** Tensor Fascia Suralis Muscle, Anomalous Muscle, Neuropathy, Aberrant Vessel.

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## INTRODUCTION

Tensor fascia suralis muscle (TFSM) is a rare anomalous muscle located in the popliteal fossa. It is an anatomical variant with anomalous origin and insertion [1]. TFSM may arise from the distal aspect of any of the hamstring muscles; majority of reported cases states the

origin from distal part of semitendinosus muscle. It may insert into the posterior fascia of the leg, into the medial head of gastrocnemius or through a thin long tendon into the superficial part of the tendo calcaneus [2-5].

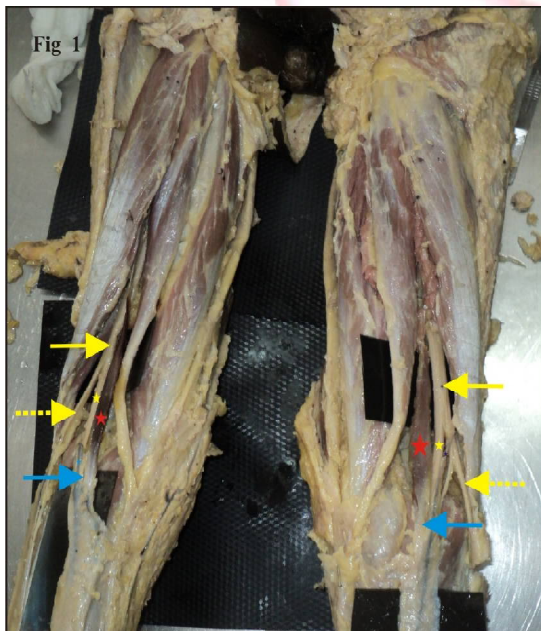
We found tensor fascia suralis muscle bilaterally during routine undergraduate dissection in

our department. The case was discussed to enhance the knowledge of the morphology of the popliteal region. Such morphological variations may lead to error in both diagnosis and treatment. Hence, this report will guide the radiologists and surgeons during diagnosis and treatment of muscular diseases in and around popliteal fossa.

### CASE REPORT

During routine educational dissection of the lower limb by medical students in our department, a variant muscle was found in the popliteal region. The anomalous muscle was located bilaterally immediately under the popliteal fascia in a 54 year old male cadaver bilaterally. After careful dissection and cleaning the superficial fascia and fat, the muscle was traced throughout to locate its attachments, course and relations (Fig.1).

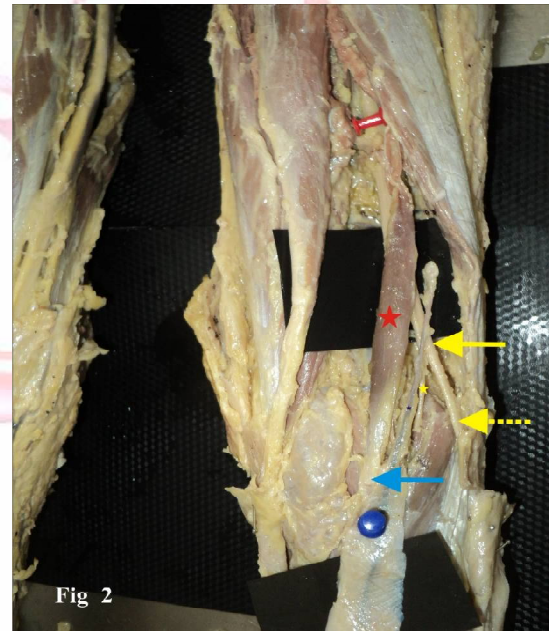
**Fig. 1:** The bilaterally present fusiform tensor fascia suralis muscle in the roof of popliteal fossa indicated by red star. The muscle is taking origin from the tendon of biceps femoris. Blue arrow shows the insertion of fusiform belly of the anomalous muscle. The sciatic nerve (yellow arrow), common peroneal nerve (yellow dash arrow) and tibial nerve (yellow star) is in lateral relation of the tensor fascia suralis muscle.



On left side, TFSM was taking origin from the ischial tuberosity along with long head of biceps femoris and semitendinosus muscle in the form of a common tendon instead of arising from a hamstring as mentioned above. The length of this tendinous origin was 27.5 cm. In the roof of

popliteal fossa, the tendon was transformed into a well defined fusiform muscle belly having the dimensions (L-12.5 cm, width 1.7cm and thickness 1.6 cm). After running distally and medially the muscle belly transformed again into a long tendon (L- 5.5 cm) which fanned out to be inserted into the deeper part of the deep fascia of crural region. The total length of the muscle was 45.5 cm. The sciatic nerve was in anterior relation to the tendinous origin and tibial nerve was anteriorly placed to the fusiform muscle belly.

**Fig. 2:** Tensor Fascia Suralis Muscle (red star) is taking origin from medial aspect of biceps femoris muscle and is inserted into the deeper part of sural fascia (blue arrow). Sciatic nerve and common peroneal nerve are in anterior relation of the anomalous muscle and the small saphenous vein (blue star) and sural nerve (yellow star) lies laterally.



The TFSM, on right side was arising from the tendon of biceps femoris muscle in upper part of popliteal fossa with a length of 4.6 cm. The fusiform muscular belly was smaller in comparison to its left counterpart with dimensions of (muscle belly L-11.5 cm, width-1 cm and thickness 1.3 cm). After running downwards and medially for about 5cms, the tendon became aponeurotic that spread out slightly to insert into the deep surface of the sural fascia halfway down the leg. The muscle was 21.1 cm in full length. The right muscle was shorter in length in comparison to left which was 45.5 cm. Nerve supply to the TFSM was through the tibial nerve in both limbs.

The anatomical relations of tendon of 5.5 and 5 cm are of great clinical importance. Superior part of the muscle was situated between the biceps femoris and semitendinosus; the lower part, its tendon was posterior to the gastrocnemius; the popliteal vessels and tibial nerve were lying anterior to the muscle. The sural nerve and short saphenous vein were in immediate lateral relation to the tensor fascia suralis muscle on both right and left sides.

**DISCUSSION**

The present findings are similar to the first case reported by KELCH (1813). He discovered a muscle which originated from the medial aspect of the long head of the biceps femoris and inserted into the tendo calcaneus and termed it tensor fasciae suralis [2-6]. According to statements of previous authors, a muscle which originates from semitendinosus, long head of the biceps femoris or from both of the above-mentioned muscle and inserts into the sural fascia or the tendo calcaneus can be termed the tensor fasciae suralis [2-4]. Consequently, the muscle found in this case report shall be regarded as tensor fasciae suralis. The TFSM have been reported unilaterally in literature summarized in Table 1. To the best of our knowledge, bilateral presentation of TFSM is not documented in literature till date.

The incidence of such anomalous muscle-tendon unit is of great clinical importance. The tendinous origin of the muscle was posterior to the sciatic nerve and the thick fusiform belly was posterior to the tibial nerve and sural nerve; the contraction of tensor fascia suralis muscle in such relation may lead to compression of any of these nerves leading to entrapment neuropathies. Pain and paresthasia along the course of these nerves will be felt in these patients [2-4].

Chason et al argued that the mass like presentation of this anomaly could relate to the size and length of the portion of the muscle that extends through the popliteal fossa. Apart from its clinical presentation, it can cause errors in the interpretation of imaging studies. When prominent, this muscle may be mistaken for a mass, on its tendon may be mistaken for an aberrant vessel. Furthermore, because the tissue characteristics are that of either normal muscle or tendon, it may be missed altogether on routine imaging studies [1,6]. Since the popliteal vein is superficial to the artery in the middle of popliteal fossa, it is possible that the variant muscle could have a compressive effect on popliteal vein [5]. Even the tibial nerve is superficial to popliteal vein which can also be compressed along with popliteal vein.

S No	Author	Year	Origin	Insertion
1	Kelch [4]	1813	Biceps femoris	tendocalcaneus
2	Halliburton [4]	1881	Biceps femoris	tendocalcaneus
3	Turner [4]	1884-5	Biceps femoris and linea aspara	tendocalcaneus
4	Gruber [4]	1897	Biceps femoris	Sural fascia
5	Schaeffer [4]	1913	Biceps femoris	Sural fascia
6	Kawai [4]	1935	Semitendinosus	Sural fascia
7	Mogi [4]	1940	Semitendinosus	Sural fascia
8	Nonoka [4]	1954	Two heads-lateral from biceps femoris and medial head from semitendinosus	Sural fascia
9	Miyauchi R [4]	1985	Two heads-medial from semitendinosus lateral from long head of the biceps femoris.	Sural fascia
10	Gupta RK et al [3]	2006	Two heads Biceps Femoris and Semitendinosus	Between the two heads of Gastrocnemius
11	Present study	2015	Tendon of long head of Biceps femoris	Deeper part of Sural fascia.

**Table 1:** Details of origin and insertion of TFSM described by Previous Authors.



## CONCLUSION

The present case will add to the existing knowledge of anatomy of the popliteal region and will guide the surgeon during various operative procedures in and around the knee. It will also be helpful to radiologist in interpretation of the ultrasonographic and MRI images correctly. Hence, proper knowledge of muscular variations is essential not only for anatomists and surgeons, but also for radiologist.

**Conflicts of Interests: None**

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