

Case Report

BILATERAL ANOMALOUS MUSCLE IN THE POPLITEAL FOSSA & ITS CLINICAL SIGNIFICANCE

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ABSTRACT

Muscle variation may occur due to genetic or developmental causes. Some variations may compromise the vascular, muscular or nervous system in the region. Bilateral muscle variation in popliteal fossa is very rare. In present study an instance of bilateral muscle variation in popliteal fossa, arising from different muscles like gastrocnemius and from biceps femoris is recorded. There is no report of such variations. These observations are rare of its kind because of bilateral asymmetrical presence and difference in the origins in different legs. This is the first report as for the literatures available. Clinical and functional importance of such variation is discussed with the morphological aspects of this anomalous muscle.

KEY WORDS: Popliteal fossa, Gastrocnemius, Biceps femoris, Popliteal Artery Entrapment Syndrome.

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Access this Article online

Quick Response code



DOI: 10.16965/ijar.2014.501

Web site: International Journal of Anatomy and Research
ISSN 2321-4287
www.ijmhr.org/ijar.htm

Received: 08 Sep 2014

Peer Review: 08 Sep 2014 Published (O):31 Oct 2014

Accepted: 22 Sep 2014 Published (P):31 Dec 2014

INTRODUCTION

The popliteal fossa is a rhomboidal region posterior to the knee joint. The boundaries of the fossa are superolaterally by biceps femoris, superomedially by semitendinosus and semimembranosus, inferolaterally by lateral head of gastrocnemius and plantaris, and inferomedially by medial head of gastrocnemius. The roof is formed by popliteal fascia. Floor is formed from above downwards by popliteal surface of femur, capsule of knee joint, oblique popliteal ligament and fascia of popliteus. The main contents are popliteal artery, popliteal vein, tibial nerve, common peroneal nerve and popliteal lymph nodes.

Third head (caput tertium) is the most common variation of gastrocnemius [1]. Tensor fascia suralis or ischioaponeuroticus is a slip of muscle that leaves the belly of the semitendinosus and ends in a tendon that joins the fascia of leg [2].

Insertion of muscle slips from biceps femoris into gastrocnemius and into tendocalcaneus have been reported [3]. Bilateral muscular variation in popliteal fossa is very common.

Variations of the hamstring muscle are not common. The anomalous muscle in popliteal region is rarer than the anomalies of the vessels and nerves [4]. Popliteal artery entrapment syndrome is an uncommon entity, with an estimated prevalence of 0.16% [1] and important infrequent cause of serious disability among young adults and athletes with anomalous anatomical relationship of popliteal artery with surrounding musculotendinous structures [5].

CASE REPORT

During routine dissection of a male cadaver of approximately 50 years age in department of Anatomy, Bangalore Medical College and Research Institute, Bangalore, anomalous mus-

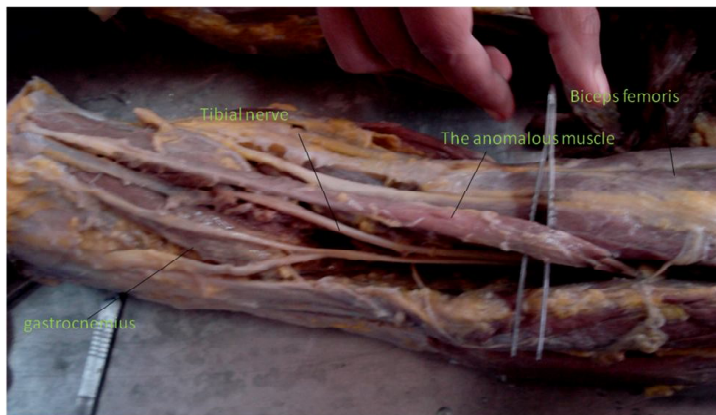


Fig. 1: Anomalous muscle in right popliteal fossa.



Fig. 2: Anomalous muscle in left popliteal fossa.

cles in both popliteal fossae were observed. The surface anatomy of both the popliteal fossae was apparently normal. The skin, superficial fascia, cutaneous nerves along with superficial veins was removed. After removing the popliteal fascia, anomalous muscle on each fossa was observed. The muscles were carefully cleaned and observed for their attachments, relation and neurovascular connections (Fig.1 and Fig.2). Measurements of these anomalous muscles given in Table 1.

Following measurements were taken on both sides:

	Right side	Left side
Length	28.6cm	32.8cm
Origin	From lateral head of biceps femoris, 14.4cm from ischial tuberosity	From posterior intermuscular septa, 13.5cm from ischial tuberosity
Max. width	0.9cm	0.7cm
Insertion	Tendinous insertion to superficial aspect of tendo calcaneus	Tendinous insertion to superficial aspect of tendo
Tendon length	2.5cm	1.4cm
Nerve supply	A branch from tibial nerve at popliteal fossa	A branch from tibial nerve below popliteal fossa
Blood supply	A branch from 4 th perforator of profunda femoris artery	A branch from 4 th perforator of profunda femoris artery

DISCUSSION

These anomalous muscles were observed on both left and right popliteal fossae. On right leg it has originated from lateral head of biceps femoris, 14.4 cm from ischial tuberosity and on left leg it has originated from posterior intermuscular septa, 13.5cm from ischial tuberosity. There is no report of such bilateral muscle variations. These observations are rare of its kind because of bilateral asymmetrical presence and difference in the origins in different legs. This is the first report as for the literature available.

A number of muscles in the human body are thought to be vestigial, either by virtue of being greatly reduced in size compared to homologous muscles in other species, by having become principally tendinous, or by being highly variable in their frequency within or between populations. In our study, we observed that, anomalous muscles were inserted to the upper part of the superficial aspect of the tendo calcaneus on both legs. In the mammals below the man the insertion of the biceps, gracilis and the semitendinosus takes place chiefly into the fascia of back of leg and extends more distally than in man [6].

This insertion of the flexor muscles is associated with a permanent position of flexion at the knee. Also there is a report of variations of biceps flexor cruris (biceps femoris) in which third head having common origin with the middle head of gastrocnemius and insertion to the tendo-achilles [7]. Recently a case of tensor fascia suralis and the third head of gastrocnemius muscles has been reported in the region of right popliteal fossa [8]. Third head (caput tertium) is the most common variation of gastrocnemius muscle and they have indicated the presence of a third head joining the medial head of gastrocnemius by CT images in a patient [1].

The Heidelberg classification of popliteal artery entrapment syndrome differentiates three categories of entrapment: in Type I, the popliteal artery has an atypical course, in Type II, the muscular insertion is atypical, and in Type III, both conditions are present [9]. The popliteal artery entrapment syndrome is a limb threatening peripheral vascular syndrome occurring predominantly in young adults [10]. On compression of popliteal artery with anomalous accessory head of gastrocnemius in all 3 patients during the surgical exploration [5]. Clinically, this type of incidence of anomalous musculotendinous structures around popliteal artery may lead to popliteal artery entrapment syndrome and also the compression of nerves and veins present in the popliteal fossa. Functionally, this type of muscles crossing knee joint may cause flexion at knee and inserting to tendocalcaneus may cause plantar flexion.

Based on the attachments of these rare anomalous muscles, we regard the anomalous muscle on right popliteal fossa, may be tensor fascia suralis or third head of biceps femoris, as it is originated from long head of biceps femoris and inserted to tendocalcaneus. In view of innervation we regard the anomalous muscle may be third head of gastrocnemius, as the nerve supply is from tibial nerve at popliteal fossa, which matches the nerve supply of gastrocnemius. On left side as it originated from posterior intermuscular septa and inserted to tendocalcaneus, the muscle may be third head of gastrocnemius.

Morphologically this kind of muscles in human being resembles the muscles existing in the lower

mammals. Clinically, this type of anomalous musculotendinous structures around popliteal artery may contribute to popliteal artery entrapment syndrome.

Conflicts of Interests: None

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How to cite this article:

Sowmya S, Meenakshi Parthasarathi, Sharmada KL, Sujana M. BILATERAL ANOMALOUS MUSCLE IN THE POPLITEAL FOSSA & ITS CLINICAL SIGNIFICANCE. *Int J Anat Res* 2014;2(4):614-616.

DOI: 10.16965/ijar.2014.501