

Case Report

ACCESSORY SOLEUS MUSCLE

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ABSTRACT

The anomalies of the soleus muscle are described in anatomy textbooks. The most common is the presence of a second muscle anterior to the normal one. The variations of insertion are either as fusion with the normal Achilles tendon or with independent anterior insertion.

These variations are usually encountered during cadaver dissections or if symptomatic, in the radiological examinations. They are often clinically significant and may require surgical treatment.

The present cadaver had a two-bellied soleus muscle. One was anatomically normal. The aberrant one originated from the normal belly on its medial side and inserted to the medial side of the calcaneus in the form of a separate tendon.

Key Words: Soleus muscle, Tendo Achilles (tendo calcaneus) - Accessory- Insertion, Variation, Calf muscles

INTRODUCTION

The soleus muscle is one of the large muscles of the calf. Normally the soleus is a broad flat muscle situated immediately deep or anterior to the gastrocnemius. It arises from the back of the head and the upper fourth of the posterior surface of the fibula, from the soleal line and the middle third of the medial border of the tibia, and from a fibrous band between the tibia and fibula which arches over the popliteal vessels and tibial nerve. The latter origin is

aponeurotic, gradually becoming thicker and narrower, and joining the tendon of gastrocnemius, it forms the tendo calcaneus. It is about 15 cm long, and originates near the middle of the leg, but its anterior surface receives muscle fibres from the soleus, almost to its lower end. It is attached to the posterior surface of the calcaneus at mid level. With the other muscles of the calf the soleus muscle is a chief plantar flexor of the foot. It is frequently said to be concerned with steadying the leg on the foot in the standing position and its postural function is emphasized more than its value as a primemover (1).

CASE REPORT

The variation was found coincidentally during routine dissection. It was present in the right lower extremity of a 57 year-old male cadaver. The normal soleus muscle originated from the back of the head and upper fourth of the posterior surface of the fibula, from the soleal line, the middle third of the medial border of the tibia and from a fibrous band between the tibia and fibula. Then, in the form of an entire belly (Eb), muscle fibres reached the middle of the leg and divided into two bellies. One of them was in its normal course, anterior to the gastrocnemius muscle, and attached as the tendo Achilles to the calcaneus (T1). The aberrant one arose from the medial aspect of the entire belly, and continued its course in the posteromedial side of the leg (T2). While passing from the posterior part of the medial malleolus, it was situated between the tendo Achilles and the tendon of the flexor digitorum longus muscle. It crossed the posterior tibial vessels, the tibial nerve and attached to the medial side of the calcaneus as a separate tendon. (Figs.1,2).

DISCUSSION

Anomalies of the soleus muscle are described in the literature (2-4).

Bonnell and Cruess, reported a case of a nine-year-old boy, who had a bilateral equinus deformity caused by a bifid tendon of the soleus muscle. The surgical treatment included transection of these tendons and a posterior capsulotomy (5).

Buschman et al, reported 4 cases of the accessory soleus muscles. In two of these cases patients complained of pain and swelling behind the ankle. One patient revealed calf atrophy and disability in full ankle motion during the examination. MRI revealed an accessory soleus muscle in both cases. The other two patients complained of pain behind their right ankles

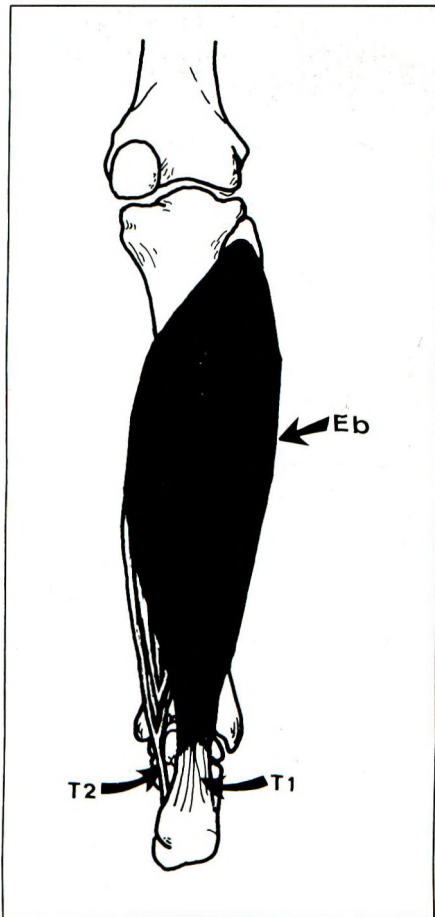


Fig. 1.: Schematic representation of the case.
 EB: Entire belly.
 T1: Tendo Achilles.
 T2: Tendon separated from the soleus muscle.

and MRI studies of both ankles assessed the presence of an accessory soleus muscle in the left side, although the left ankle was asymptomatic. The cause of the pain of the right ankle was found to be due to synovitis (6).

Ger and Sedlin, reported a case of a 13 year-old-boy complaining of swelling and pain similar to the mentioned cases. After radiological examinations, an accessory soleus muscle was revealed (7).

Gordon and Matheson, reported a 22-year-old patient with a large posterior mass in his ankle. It was painless but he reported that after stressful activity, the mass became larger and more turgid with difficulty in plantar flexing the foot. This muscle did not have an independent blood and nerve supply (8).

Nichols and Kolenah in 1984, Nidacher et al. in 1984, Romanus et al. in 1986 and Dunn in 1965 reported similar cases (9-12).

An accessory soleus muscle frequently gives significant clinical symptoms. In asymptomatic cases MRI, CT or ultrasound alone may be satisfactory to confirm the suspected diagnosis of the accessory soleus muscle. In symptomatic cases, MRI can be used to identify the mass as a normal muscle tissue. In addition, the multiplanar anatomic display provided with MRI may aid surgical planning (13). Definite diagnosis is established radiologically, otherwise the condition may frequently be mistaken for a bursa or soft tissue tumor, such as lipoma, hemangioma or sarcoma.

The most common symptoms are pain and swelling behind the ankle. In some reported cases, it has been seen to cause an equinus deformity and difficulty in dorsiflexion (5,8,11). Surgery provides complete treatment.

During the embryological development, the soleus muscle may undergo early splitting, and result in an accessory soleus muscle. This muscle can either have an independent blood supply and nerve innervation or common with the soleus (12).

An accessory soleus muscle may be the cause of many significant clinical symptoms. Therefore the variations of this muscle must be well known and recognized by the clinician.

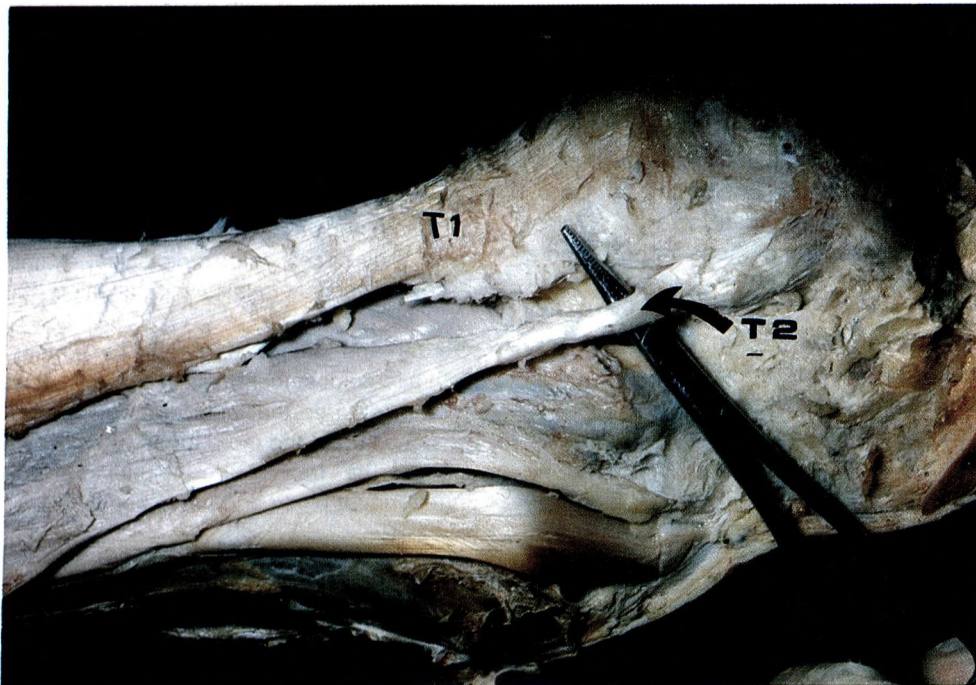


Fig.2.: Two tendons of the soleus muscle: posteromedial view.

T1: Tendo Achilles.

T2: Tendon separated from the soleus muscle.

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