International Journal of Biomedical And Advance Research

ISSN: 2229-3809 (Online)
Journal DOI:10.7439/ijbar
CODEN:IJBABN

Case Report

Accessory soleus muscle and its clinical significance

Soumitra Trivedi[*1], S Athavale[2], S Kotgiriwar[2], TP Sinha[1] and AU Siddiqui[1]

[1] *Department of Anatomy, All India Institute of Medical Sciences, Raipur, (C.G.) India*
[2]*Department of Anatomy, All India Institute of Medical Sciences, Bhopal, (M.P.) India*

*** Correspondence Info:**
Dr. Soumitra Trivedi,
Assistant Professor,
Department of Anatomy,
All India Institute of Medical Sciences, Raipur, (C.G.) – 492099 India
E-mail: dr.somit@gmail.com

Abstract

Accessory soleus muscle, presenting as a tumefaction in the posteromedial region of the ankle, is a rare congenital anatomical variant. In cadaveric studies, the incidence ranged from 0.7 to 6%. It manifests in the 2nd or 3rd decade of life with increase in the muscle mass. Symptomatic cases often present after an increase in physical activity, usually in sports persons as ankle pain and swelling. It is reported to be frequently seen associated with Achilles tendonopathies. The swelling medial to the tendocalcaneous can be due to ganglion/ lipomas/ hemangiomas/ synoviomas/ sarcomas. The condition can be diagnosed clinically by radiographic imaging, MRI being the investigation of choice. Symptomatic cases can be treated with fasciotomy or surgical excision of the mass

Keywords: accessory soleus, Achilles tendon, variations

1. Introduction

Although congenital in origin, cases of accessory soleus are usually manifested in the 2nd or 3rd decade of life[5,6,9,10], affecting males more commonly than females[11]. The symptoms associated are usually ankle pain on exertion and swelling around the posteromedial region of the ankle. The presenting population is more commonly the athletes, which become symptomatic after increase physical activity and muscle mass. In cadaveric studies the incidences ranged from 0.7 to 6% [4,5,9,10,11]. Clinical studies showing incidence as high as 10% and 11.6% were also reported, most of which were asymptomatic [2,12]. The latter study, showing the highest incidence was reported to be seen more commonly in females[12].

2. Case Report

During the routine dissection of a male cadaver, a bilateral presence of separate muscle belly was seen descending on the medial side of the soleus muscle. It appeared as a separated medial part of the Soleus muscle that did not join with rest of the muscle and Gastrocnemius to form the Achilles tendon. The muscle mass seen on the medial side of Achilles tendon was covering the tibial nerve and posterior tibial vessels. Further, the muscle mass passed deep to flexor retinaculum lying superficial to the other structures. After excising the flexor retinaculum the muscle mass was seen inserted on the anterior part of the medial surface of calcaneum.

Fig 1. Dissected leg and foot (Right)
a - muscle bellies of triceps surae, b - tendocalcaneous, c - accessory soleus
d - tibial nerve and posterior tibial vessels, e - long flexor tendons f - medial malleolus

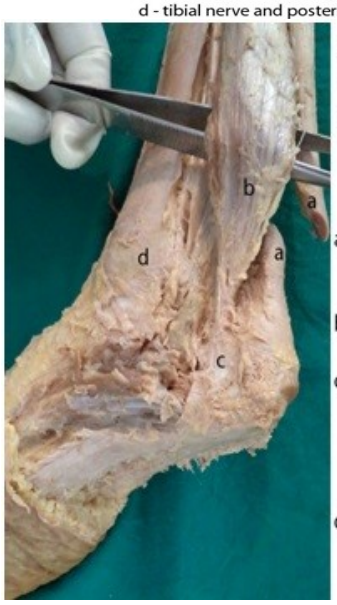

Fig 2. Dissected accessory soleus after cutting flexor retinaculum

a - cut edges of tendocalcaneus

b - accessory soleus

c - insertion of accessory soleus on the medial surface of calcaneum

d - medial malleolus

Fig 3. Dissected leg and foot (Left) with black block suggesting alignment of flexor retinaculum

a - tendo calcaneus

b - accessory soleus

c - tibial nerve and posterior tibial vessels

d - long flexor tendons

3. Discussion

Embryologically, accessory soleus might be due to the fact that soleus separates into two parts during early development, the accessory part carrying the separate arterial and nerve supply[10,11,12].

The presence of tumefaction in the posteromedial region of the ankle joint with or without symptoms can lead to variety of diagnosis. The differential diagnosis includes the lipomas, hemangiomas, ganglion, synoviomas and sarcomas[4]. The only clinical sign presented by accessory soleus is that the tumefaction becomes hard if the patient is asked to contract triceps surae against resistance and on releasing the resistance it becomes soft. Although, the diagnosis has to be confirmed by radiological procedures including electromyograms, x-ray, ultrasound, CT Scan and MRI. All the investigations are suggestive of soft tissue mass on radiology having consistency similar to the muscle. MRI is the investigation of the choice to confirm the muscle nature of the mass.

The accessory muscle passes deep to the flexor retinaculum along with tendons of long flexors and tibialis posterior, posterior tibial vessels and tibial nerve. Tibial nerve and Posterior tibial artery divide deep to flexor retinaculum into terminal branches, i.e. medial and lateral plantar nerves and vessels. These structures lying deep to flexor retinaculum get compressed due to accessory soleus and lead to localized compartment syndrome involving muscle ischemia and compressive neuropathy which gets exaggerated by exercise or exertion. Pain is usually secondary to closed compartment ischemia. Accessory soleus has also been reported associated with tarsal tunnel syndrome, foot pain secondary to tibial nerve compression[11].

Symptomatic cases needed to be corrected surgically by either doing fasciotomy or preferably the surgical excision of the accessory muscle mass.

4. Conclusion

The presence of accessory soleus is not so uncommon variation seen in the lower extremity. Although, most of the clinical cases presented, were athletes or the symptoms precipitated after increased physical activity. There is no denying to the fact that the incidence of the accessory soleus can be more than the number given, as with increase in the sedentary lifestyle, most of the cases may go unnoticed. Surgical interventions are required only for symptomatic cases leading to compression symptoms. Once the diagnosis is confirmed, preferably by MRI, symptomatic cases can be further treated by surgical excision of the mass or fasciotomy.

References

1. Rossi F and Dragoni S. Symptomatic accessory soleus muscle: report of 18 cases in athletes. *J Sports Med Phys Fitness.* 2005; 45(1): 93-7.
2. Kouvalchouk JF, Lecocq J, Parier J, Fischer M. The accessory soleus muscle: a report of 21 cases and a review of the literature. *Rev Chir Orthop Reparatrice Appar Mot.* 2005 May; 91(3):232-8.
3. Luck MD, Gordan AG, Blebsa JS. Dalinka MK. High association between accessory soleus muscle and Achilles tendonopathy. *Skeletal Radiol.* 2008; 37(12):1129-33.
4. Brodie JT, Dormans JP, Gregg JR, Davidson RS. Accessory soleus muscle. A report of 4 cases and review of literature. *Clin Orthop Relat Res*. 1997; (337): 180-6.
5. Rossi R, Bonasia DE, Tron A, Ferro A, Castoldi F. Accessory soleus in the athletes: literature review and case report of a massive muscle in a soccer player. *Knee Surg Sports Traumatol Arthrosc.* 2009; 17(8): 990-5.
6. Kendi TK, Erakar A, Oktay O, Yildiz HY, Saglik Y. Accessory soleus muscle. *J Am Podiatr Med Assoc*. 2004; 94(6): 587-9.
7. Downey MS and Siegerman J. Accessory soleus muscle: a review of literature and case report. *J Foot Ankle Surg.* 1996; 35(6): 537-43.
8. Palaniappan M, Rajesh A, Rickett A, Kershaw CJ. Accessory soleus muscle: a case report and review of the literature. *Pediatr Radiol.* 1999; 29(8): 610-2.
9. Mir NM and Kangoo KA. Accessory soleus muscle: A case report and review of literature. *JK Science.* 2002; 4(1): 41-42.
10. Doda N, Peh WCG, Chawla A. Symptomatic accessory soleus muscle: diagnosis and follow up on magnetic resonance imaging. *The British Journal of Radiology.* 2006; 79: e129-e132.
11. Leswick DA, Chow V, Stoneham GW. Answer to case of the month #94. Accessory soleus muscle. *Can Assoc Radiol J.* 2003; 54(5): 313-5.
12. Del Nero FB, Ruiz CR, Junior RA. The presence of accessory soleus muscle in humans. *Einstein.* 2012; 10(1): 79-81.