Accessory Muscles

Anatomy, Symptomatology, and Imaging

Melanie Chang
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Objectives

- Review anatomy of common accessory muscles
- Discuss potential role in symptom causation
- Describe characteristic imaging features
Introduction

Anatomic variants representing additional distinct muscles along with the normal complement of muscles

Often asymptomatic, incidental finding

Palpable swelling, mass effect on neurovascular structures

MRI can differentiate them from soft tissue tumors
Shoulder
Accessory Head of Biceps Brachii

Prevalence 9-23%

Origin: greater tuberosity close to articular capsule

Insertion: joins other BB muscle heads at level of humerus midshaft

Key points

Not to be mistaken for longitudinal tearing of long head biceps tendon

Musculocutaneous nerve can pass behind, in front of, or through the extra head
Accessory coracobrachialis muscle

Origin: base/inferior surface of coracoid process

Insertion: anterior capsule of GHJ, medial border of bicipital groove, and medial aspect of humeral surgical neck
Small muscle belly may mimic subcoracoid bursitis on US
May result in subcoracoid impingement
May compress musculocutaneous nerve, median nerve, or even lateral cord of brachial plexus

Elbow
Anconeus epitrochlearis muscle

Prevalence 11-34%

Origin: medial cortex of olecranon

Insertion: inferior surface of medial epicondyle

Key points

Relationship to ulnar nerve explains association with cubital tunnel syndrome

Needs to be distinguished from ulnar head of flexor carpi ulnaris muscle (more distal)

Accessory head of Flexor Pollicis Longus muscle

Aka Gantzer muscle

Prevalence 45-66%

Origin: medial epicondyle vs coronoid process vs flexor digitorum superficialis muscle

Insertion: ulnar border of FPL

Key points

Can compress median/anterior interosseous nerves

Wrist/Hand
Volar side
Accessory flexor digitorum superficialis indicis muscle

Origin: FDS tendon adjacent to transverse carpal ligament

Insertion: index finger in region of A1 pulley

Key points

May present as palpable soft tissue mass in the palm

Can compress median nerve in carpal tunnel

Accessory abductor digiti minimi

Prevalence 24%

Origin: antebrachial fascia or palmaris longus tendon in lower ⅓ forearm

Insertion: on ADM or onto ulnar aspect of proximal phalanx base

Key points

Accessory ADM is still fleshy as it crosses Guyon’s canal and can compress ulnar nerve

Normally NO muscle in Guyon’s canal at level of pisiform

Palmaris brevis muscle

Normal muscle that may be mistaken as a variant

Located in SQ tissues volar to neurovascular structures of Guyon’s canal, but DISTAL to pisiform and inserts into the skin

Variations in palmaris longus muscle anatomy

Flexor carpi radialis brevis vel profundus muscle

Origin: volar aspect of distal radius (distal to origin of FPL)

Insertion: onto capitate bone and base of 3rd and 4th metacarpals

Wrist/Hand
Dorsal side
Extensor digitorum brevis manus muscle

Origin: dorsal wrist capsule deep to extensor retinaculum vs distal radius vs deep carpal fascia

Insertion: extensor hood of 2nd or 3rd finger

Key Points

Often dx clinically as ganglion, synovial nodule/cyst, soft tissue tumor, or a carpal boss

Remember - muscle belly of extensor tendons should NOT extend to level of carpal bones

Extensor Carpi Radialis intermedius

Prevalence 12-24%

Origin: between origins of ECR longus and brevis

Inserts: onto base of 2nd or 3rd metacarpal or abductor pollicis longus muscle

Key Points

Can mimic split tear of ECR tendons in the 2nd extensor tunnel

Knee

# Popliteal artery entrapment syndrome

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Aberrant course of the popliteal artery medial to a normal MHG</td>
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<tr>
<td>Type 2</td>
<td>Abnormal lateral insertion of the MHG and medial deviation of the popliteal artery</td>
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<tr>
<td>Type 3</td>
<td>Compression of a normally positioned popliteal artery by an accessory slip of the MHG</td>
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<tr>
<td>Type 4</td>
<td>Abnormal location of the popliteal artery, deep in the popliteus muscle or beneath fibrous bands in the popliteal fossa</td>
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<tr>
<td>Type 5</td>
<td>Any form of the entrapment that involves both the popliteal artery and vein</td>
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Abbreviation: MHG, medial head of gastrocnemius muscle.
Tensor fasciae suralis muscle

Origin: distal semitendinosus muscle

Insertion: posterior fascia of leg, medial head of gastrocnemius, or via a long thin tendon onto superficial Achilles tendon

Carroll JF. Accessory Muscles of the Knee. Radsourse 2015.
Key points

Can present with popliteal soft tissue swelling/mass

Similar location as accessory semimembranosus

Carroll JF. Accessory Muscles of the Knee. Radsourse 2015.
Accessory popliteus

Origin: common with lateral gastrocnemius

Insertion: posteromedial capsule

Ankle
Lateral side
Peroneus tertius

Prevalence: 83-95%

Origin: anterior surface distal fibula and EDL muscle

Insertion: base/dorsal surface of 5th metatarsal shaft

Key Points

May cause snapping over lateral talar dome
Anterior fibulocalcaneus

Origin: fibula and anterior crural septum

Insertion: critical angle of Gissane on calcaneus

Key Points

May be mistaken for peroneus tertius in anterior compartment, look at distal insertion
Peroneus quartus

Prevalence 13-26%

Origin: peroneus brevis (less often posterior fibula or peroneus longus)

Insertion:
- Peroneocalcaneus externum: peroneal tubercle or retrotrochlear eminence
- Peroneocuboideus
- Peroneoperoneolongus
- Inferior peroneal retinaculum adjacent to retrotrochlear eminence

Key points

May be mistaken for longitudinal split tear of peroneal tendons

May cause lateral ankle pain/instability

“Crowding effect”

Associated with retrorotrochlear eminence hypertrophy

Ankle
Medial side
Flexor digitorum accessorius longus

Prevalence 6-8%

Origin: medial margin of tibia and fascia of deep posterior compartment or lateral margin of fibula distal to origin of FHL

Insertion: quadratus plantae muscle or FDL tendon

Key points

Associated w/ tarsal tunnel syndrome and FHL tenosynovitis

**Peroneocalcaneus internus**

Prevalence 1%

Origin: inner aspect lower ¼ fibula, below FHL origin, w/interdigitation between these 2 muscles

Insertion: small tubercle on medial calcaneus below sustentaculum tali

Key points

Can displace FHL muscle medially, indirectly compressing neurovascular bundle

FHL can have 2 tendon slips, may be mistaken for PCI tendon

Accessory soleus

Prevalence 0.7-5.5%

Origin: deep surface of soleus or the fibula and soleal line of tibia

Insertion: Achilles tendon, superior surface of calcaneus, medial aspect of calcaneus

Key points

May cause exertional pain

Hypertrophy can compress posterior tibial nerve
Tibiocalcaneus internus

Origin: medial crest of tibia

Insertion: medial surface of calcaneus, 1-2cm anterior to Achilles tendon insertion

Al-Himdani S, et al. Accessory muscles around the foot and ankle presenting as chronic undiagnosed pain. The Foot 2013
Key points

Distinct from accessory soleus - look at flexor retinaculum

Distinct from FDAL - look at distal insertion
That's all Folks!
References