Drifts and Shifts of the Peroneus Longus Roller Coaster

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01.26.2017
• Superficial muscle at upper-lateral aspect of leg

• Long tendon
• 1\textsuperscript{st} turn extends anteriorly behind the lateral malleolus, in a fibro-osseous canal underneath the superior peroneal retinaculum.
• 2\textsuperscript{nd} turn extends forward across the lateral side of the calcaneus, below the peroneal tubercle, beneath the inferior peroneal retinaculum.
• 3\textsuperscript{rd} turn anteriorly below the cuboid, may have os peroneum.
• Crosses sole of foot obliquely and inserts predominantly at base of MT1 and C1.

• Evert (strong) and Plantarflex (weak) ankle. Plantarflex first ray.
Muscular and Tendinous Origins

**Tendinous**
- Anterior tibiofibular ligament
- Lateral Tibial Condyle
- Fibular head

**Muscular**
- Anterior and Posterior Intermuscular Septa (extensions of the crural fascia)
- Lateral Surface of Proximal 2/3 of Fibula
Peroneus Longus Muscle

- Bipennate muscle

- Connective tissue partitioning separates PL muscle into 4 segments, each with its own motor branch from superficial peroneal nerve.
  - Anterior Superficial
  - Anterior Deep
  - Posterior Deep
  - Posterior Superficial

- Pattern of partitioning is constant. But relative sizes of compartments vary.
Tendon lies on lateral aspect of muscle.

Myotendinous junction located proximal to superior peroneal retinaculum.
Arising from sciatic nerve, CPN courses btw lateral gastrocnemius and biceps femoris.

CPN winds around the fibular neck, in a subcutaneous position.

CPN divides into superficial and deep peroneal nerves.
Peroneal Tunnel

- A musculo-aponeurotic arch formed by peroneus longus and soleus
- CPN courses btw tendinous heads of peroneus longus.
- Fibular neck = floor
- CPN is relatively fixed at this location.
Common Peroneal Nerve Palsy

Background

• Most common mono-neuropathy in lower extremity
• Occurs most commonly in knee
• Etiology: Traction, contusion, penetrating trauma, iatrogenic, etc.

Clinical Features

• Pain over fibular neck
• Pain radiating to anterolateral leg
• Weakness of dorsiflexion and eversion
• Footdrop
• Worse with ankle inversion, stretching peroneal nerve

• Ossification at PL origin
• Occurs at lateral side of fibula
  – vs. soleus tug lesion occurs on medial side of fibula
• Narrows peroneal tunnel
44yo F, deceleration/twisting injury of knee during softball game, now with pain and weakness.

Sprains of anterosuperior & posterosuperior tibiofibular lig

Bone marrow contusions pattern concerning for recent transient dislocation of proximal tib-fib joint

Muscle strains of anterior and lateral compartments

Lateral supporting structures were intact except for very-low-grade sprain of fibular collat lig.
Tears of the Peroneus Longus Muscle

- Uncommon
- Much less frequent than distal tendon tears
- Handful of reported cases tell a similar story of *acute inversion injuries in young adult males, often athletes*
- Able to ambulate following injury, but present hours later with *lateral compartment syndrome*

<table>
<thead>
<tr>
<th></th>
<th>Age/Gender</th>
<th>Injury</th>
<th>Location</th>
<th>Complete/Incomplete Tear</th>
<th>Compartment Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davies (1979)</td>
<td>26yo M</td>
<td>Soccer</td>
<td>Myotendinous Junction</td>
<td>C</td>
<td>Yes</td>
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<tr>
<td>Gwynne and Theis (1997)</td>
<td>21yo M</td>
<td>Rugby</td>
<td>Mid-portion of muscle</td>
<td>?C</td>
<td>Yes</td>
</tr>
<tr>
<td>Lee et al (2009)</td>
<td>37yo M</td>
<td>Soccer</td>
<td>Origin</td>
<td>C</td>
<td>Yes</td>
</tr>
<tr>
<td>Merriman et al (2015)</td>
<td>23yo M</td>
<td>Football</td>
<td>Proximal muscle</td>
<td>I (Large)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Pulau Wotap, Indonesia

https://twitter.com/i/we_galaxi/status/498905866771612238
http://www.justdogbreeds.com/scottish-terrier.html
Synovial Sheath

- Peroneus longus and brevis share a H-shaped common synovial sheath at the level of the lateral malleolus, dividing at both its proximal and distal portions.
  - Location of upper bifurcation varies
  - Distal bifurcation occurs at peroneal tubercle

- There may be a separate PL sheath at level of cuboid tunnel, overlapping with the main sheath.

- Separate PL sheath in plantar foot after tendon passes cuboid, terminating just before insertion.
Tenosynovial Fluid
• Small amounts of tenosynovial fluid frequently occur in asymptomatic ankles
• Amount of fluid is proportional to size of ankle and posterior subtalar joint effusion.

Tenosynovitis
• Inflammation of synovial sheath (thickening and enhancement)
• Etiologies: Inflammatory (RA), infectious, mechanical, hormonal
Stenosing Tenosynovitis

- Mechanical constriction of tendon by thickened retinacula or pulley of fibro-osseous channels, limiting free tendon excursion and causing tendon/sheath damage

- Etiologies
  - Overuse
    - Repetitive movements
    - Sports-related
    - Occupational
  - Trauma
  - Estrogen stimulation/deficit
  - Congenital

- Named ST’s
  - De Quervain Tenosynovitis
  - Trigger finger

Stenosing Tenosynovitis of PL

• 3 Fibro-Osseous Channels
  – Retromalleolar sulcus
  – Peroneal tubercle
  – Cuboid tunnel

• Predisposing factors
  – Enlarged peroneal tubercle
  – Peroneus quartus
  – Os peroneum

• Symptoms
  – Lateral ankle pain and swelling
  – Worse with motion
  – No instability

Tenosynovitis with linear areas of hypointensity and synovial constriction
Partially healed tear of the peroneus brevis
Stenosing Tenosynovitis of PL 2/2 Compression btw Enlarged Peroneal Tubercle and Inferior Peroneal Retinaculum

(a) Retinacular thickening
(b) Retinacular hypervascularization
Synovial Lipomatosis Arborescens

- Fatty infiltration and hyperplasia of sub-synovial tissue

- Etiology
  - Idiopathic
  - Occasionally associated with OA, chronic RA, trauma

- Insidious onset of joint swelling and mechanical symptoms
Tophaceous Synovitis

Chronic tophaceous synovitis and urate crystal deposing in tendon reduce tensile strength, and may lead to eventual tendon rupture.

Barking-the-tree-that-looks-like-a-dog
Superior Peroneal Retinaculum

- Anchors peroneal tendons behind retromalleolar groove
- Primary restraint against lateral peroneal tendon subluxation
- Width 10 – 20 mm
- Thickness 1 mm
- Origin:
  - Periosteum along lateral border of retromalleolar groove and distal fibula
- Insertion:
  - Achilles tendon aponeurosis
  - Inferior oblique band (40%): lateral calcaneus behind CF ligament or deep aponeurosis
Superior Peroneal Retinaculum

SPR continuous with superficial and deep aponeuroses

Inferior oblique band inserts at lateral wall of calcaneus behind CF lig
Fibrocartilaginous Labrum

- 3 cm – 4 cm long ridge of tissue on posterolateral bank of retromalleolar groove
- Resembles fibrocartilage
  - Composed of dense collagen fibers and elastin
- Deepens effective depth of retromalleolar groove
  - Functional importance debated
- Loosely connected to the periosteum
  - Usually stays with fibula when SPR avulsed
Intra-Sheath Peroneal Tendon Subluxation

• Intact SPR
• Reversal of normal peroneal tendon relationship, with PL anterior to PB
• May be elicited with dorsiflexion and eversion

• Subjective sense of popping, snapping, and/or clicking without clinical or imaging evidence of subluxation

• Association with
  • Low-lying peroneus brevis muscle or peroneus quartus
  • Peroneal tendinosis, tears, prior surgery
Type A Intra-Sheath Subluxation
Type B Intra-Sheath Subluxation
Superior Peroneal Retinacular Injuries

Mechanism
• Sudden dorsiflexion of the foot and forceful contraction of peroneal muscles

Predisposition
• Congenital foot deformities
• Peroneus quartus or low-lying peroneus brevis muscle

Associations
• Chronic peroneal tendon dislocation
• Peroneal tendon tears
• Low lateral ligamentous injuries
Oden’s Classification of SPR Injuries

**Type I** (most common injury)
SPR periosteum stripped from distal fibula

**Type II**
SPR avulsed from fibula

**Type III**
Avulsion fracture from fibula

**Type IV**
SPR torn at posterior attachment

Type I SPR Injury

- Periosteal stripping of fibular attachment of SPR
- No peroneal tendon subluxation
Type I SPR Injury

with lateral subluxation of peroneus brevis

- PL dislocated into pouch formed by stripped-off SPR and periosteum
- Convex retromalleolar groove
Type II SPR Injury

- Tear of SPR at its fibular attachment
Type III SPR Injury

- Small, linear ossification adjacent to distal fibula, classic for SPR avulsion fracture
- PL tendinosis and lateral subluxation
Retromalleolar Groove

- **Mabit**
  - 82% smooth and slightly concave
  - Up to 2 mm - 3 mm depth
  - 11% flat
  - 7% convex

- **1 cm**
- **6 - 7 mm in 62%**
  - (Range 5 – 10 mm)
  - Wider superiorly than inferiorly
Mabit et al measured angle btw axis of tibiofibular articular surface and tangent of retromalleolar groove, based on 20 dry bone specimen.

Average 78° posterior orientation
Range 55° - 90°

Examination of 3 clinical cases of ankle instability yielded orientations of:
45°
54°
70°
Inferior Peroneal Retinaculum

- Rectangular band
- Thickness 0.8 mm

- Origin: Posterior aspect of lateral rim of sinus tarsi
  - May blend with lateral root of inferior extensor retinaculum

- Insertion:
  - Retrotrochlear eminence (behind peroneal tubercle)
  - A slip to peroneal tubercle separates PB anteriorly and PL posteriorly
  - Also divides common peroneal tendon sheath

- Covers both peroneal tendons
Inferior Peroneal Retinaculum
32yo M s/p inversion injury 3 months ago.

- High-grade ATFL tear
- Thickened IPR

If IPR torn, PL may dislocate over peroneal tubercle.

Clinical lateral ankle instability.

Peroneal Tubercle

- aka Trochlear process
- Incidence: 33 – 97.6%
- Bony protuberance along anterior 1/3 of lateral wall of calcaneus
- Runs posterosuperior to anteroinferior
- Located anterior to retrotrochlear eminence

- Insertion site of inferior peroneal retinaculum
- Serves as pulley for PL tendon
Peroneal Tubercle

- Size varies: average ~ 3 mm
  - Length: 2 – 20 mm
  - Width: 0.2 – 10 mm
  - Height: 0 – 9 mm

- Shape varies
  - Flat
  - Oval
  - Ridge
  - Anterior and posterior ridges
  - Tunnel-like
Peroneal Tubercle Hypertrophy

• Etiology
  – Trauma
  – Altered weight-bearing
  – Inflammation

• Association
  – PL tendinopathy
  – Peroneus quartus muscle (may insert onto retrotrochelar eminence or peroneal tubercle)
  – Fracture
  – Pes planus or cavus
  – Os trochlear calcanei
  – Osteochondroma
Intra-articular fracture of calcaneus has strong association with PL tendon injury.

- Tenosynovitis
- Displacement or Extrinsic compression
- Entrapment
- Tear

Symptoms
- Chronic lateral ankle pain over the peroneal tendons
- Weakness
Peroneocuboid Joint

- PL tendon bends at nearly right angle around cuboid tubercle, which often bears an articular facet for os peroneum

- Thin synovial membrane
  - Does not communicate with PL tendon sheath or other tarsal joints
# Peroneocuboid Joint

<table>
<thead>
<tr>
<th></th>
<th>Cuboid, Lateral Tuberosity</th>
<th>PL Articular Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shape</strong></td>
<td>Oval</td>
<td>Round or Oval</td>
</tr>
<tr>
<td><strong>Contour</strong></td>
<td>Slightly convex</td>
<td>Flat or slightly concave</td>
</tr>
<tr>
<td><strong>Cartilage</strong></td>
<td>Hyaline cartilage</td>
<td>Fibrocartilage</td>
</tr>
<tr>
<td><strong>Surface area (mm²)</strong></td>
<td>79.37 ± 20.24</td>
<td>67.35 ± 28.53</td>
</tr>
<tr>
<td><strong>Cartilage thickness (mm)</strong></td>
<td>0.52 ± 0.07</td>
<td>0.34 ± 0.08</td>
</tr>
</tbody>
</table>

Os Peroneum

- Intratendinous accessory ossicle
- Usually at level of calcaneocuboid joint
- Cartilage-covered
- Separated from cuboid by a bursa

- Incidence: 5 – 26% of random radiographs
  - Often bipartite or multipartite
- Anatomical society study of 225 feet
  - 20% have os peroneum
  - Additional 55% have fibrocartilaginous sesamoids
Os Peroneum

Four soft tissue anchors to

- Plantar fascia
- MT5 base
- Cuboid
- Peroneus brevis tendon
Peroneocuboid Joint

- May undergo the same processes as adjacent joints (e.g. degenerative, inflammatory, septic arthritis)

**DISH** –
- bony proliferation of os peroneum

Os Peroneum Syndrome

Varieties
1. Acute os peroneum fracture or diastasis of a multipartite os peroneum
   • May be associated with PL tear
2. Chronic os peroneum fracture or diastasis
3. PL tendon rupture proximal or distal to os peroneum
4. PL attrition or partial rupture proximal or distal to os peroneum
5. Large peroneal tubercle entrapping PL tendon and/or os peroneum during tendon excursion

Symptoms
• Pain along distal course of PL tendon at peroneal tubercle or cuboid tunnel
• Pain may radiate proximally along PL muscle
• Pain and weakness with resisted plantarflexion of first ray and forced foot eversion
• Dysesthesia along sural nerve distribution
• Sensation of walking on pebbles
Edematous os peroneum

Low-grade intrasubstance tearing of peroneus longus

Tenosynovitis
Sclerotic, enlarged os peroneum
PL tendinosis
PL tear and proximally retracted os peroneum
Cuboid Tunnel

- PL tendon runs obliquely in a fibro-osseous groove along plantar surface of cuboid, in a posterolateral to anteromedial direction

- Posterior border = Cuboid crest
  - Medial continuation of cuboid tuberosity

- Anterior border = Articular surface with MT4 and MT5 bases
  - A ridge of bone present in 70%
Long plantar ligament forms floor of cuboid tunnel.
- Lateral and deep fibers insert on cuboid crest
- Medial and superficial fibers insert onto MT bases (3+4)

Short Plantar Ligament inserts onto cuboid proximal to PL tendon.

Asterisk = PL tendon
• Variable anterior and posterior frenular ligaments at level of cuboid-sesamoid
  – Anterior → MT5 base
  – Posterior → Cuboid

• After passing cuboid, PL becomes enclosed by a second synovial sheath that terminates just before the tendon insertion.
Mild edema surrounding distal PL tendon in cuboid groove, likely reflecting low-grade sprain of long plantar ligament.
Cuboid syndrome

- Aka peroneal cuboid syndrome, subluxed cuboid, locked cuboid, etc.
- Minor subluxation of the calcaneocuboid joint, progressing to injury of joint capsule, adjacent ligaments and PL tendon
- Lateral foot pain
- Associations
  - Athletes: 4% prevalence (Newell and Woodle, 1981)
  - Professional ballet dancers: 17% of all reported foot and ankle injuries (Marshall and Hamilton, 1992)
  - Plantar flexion and inversion ankle injury (Jennings and Davies, 2005)
- Mechanism
  - Cuboid is a pulley for the PL tendon to plantarflex the first ray, which promotes stability and lateral-to-medial load transfer during late propulsive phase of walking.
  - Calcaneocuboid joint should be in maximal congruency (“locked”) during propulsion.
  - PL exerts an eversion torque on the cuboid. Forceful eversion of cuboid leads to loss of congruence in the calcaneocuboid joint.
  - Effects may be magnified in pes cavus, 2/2 increased mechanical advantage of PL tendon.
- Difficult clinical and imaging diagnosis
  - Evaluation of short plantar ligament, bifurcate ligament, dorsal and plantar calcaneocuboid ligaments
Subcortical Subtendinious Bone Marrow Edema

- Occasionally associated with nonarticular bone proliferation
- Significant association with tendinosis or tear
Wrap-Around Tendon

• Term coined by Alexander and Dimery (1985)
  Any tendon that courses around a bony or fibrous pulley prior to insertion
  – Relationship may be constant or positional

• Many are Fibrocartilaginous
  – Spiral arrangement of small fascicles within tendon, interwoven with collagen fibers
  – Continuous spectrum of differentiation from dense fibrous connective tissue to hyaline cartilage throughout thickness of tendon

• Function
  – Fibrous tissue: flexibility and toughness
  – Cartilage: elasticity
Wrap-Around Tendon

• Fibrocartilage metaplasia is an adaptation to compression or shear.
  – Surgically translocated tendons develop fibrocartilage at pulley on side of compression.
  – Conversely, cartilage cells of wrap-around tendons disappear when surgically rerouted into a ‘direct’ tendon.
    (Ploetz 1938, Gillard et al 1938, Malaviya et al 1996)

• Debate on relationship between development of fibrocartilage and tendon degeneration

• Important role in healing
Wrap-Around Tendon

- PL is the most fibrocartilaginous tendon in humans.

- 3 wrap-arounds
  - Retromalleolar groove
  - Peroneal tubercle
  - Cuboid groove: most fibrocartilaginous pulley

- Locations correspond with areas of avascularity within tendon

Toluidine blue

Vascularity of the Peroneus Longus Tendon

• Posterior peroneal artery and branches of the medial tarsal artery

• Arborize into a network of vessels within two posterior mesotenon/vincula along the peroneal tendons

• Vessels penetrate the tendons and anastomose with an intratendinous arterial network, most oriented longitudinally

Avascular Zones

• Continuous network of intratendinous vessels posteriorly

• Interrupted anteriorly at level of
  – Retromalleolar groove to peroneal tubercle: 38 - 63 mm
  – Cuboid: 18 - 31 mm length

• Avascular zones correspond with most frequent sites of tendinopathy
Peroneus Longus Tendon Tears

• Longitudinal tears >> Transverse
  – Length of tear varies, does not appear to affect outcome

• Chronic tears >> Acute

• Etiology
  – Attritional
    • Shallow, convex, or irregular fibular groove
    • SPR disruption and PL subluxation over sharp posterior edge of fibula
    • Peroneus quartus
    • Enlarged peroneal tubercle
    • Gliding under cuboid bone
    • Hindfoot varus → increased force through peroneal tendons
  – Inversion, sports-related injury

• Less common than peroneus brevis tears
42yo M, sudden onset severe right forefoot pain and swelling associated with a loud pop while pushing off during running exercise followed by difficulty bearing weight

- High-grade tear of PL just distal to cuboid groove
- Tendinosis
- Low-grade sprain of Lisfranc ligament complex
http://www.suggestedpost.eu/diy-dog-bouquet/
Peroneus Longus Insertion

Two major divisions

• Plantar-lateral aspect of MT1 base
  • Consistent, strong band
  • Arises from superficial, plantar portion of tendon
• Plantar-lateral aspect of medial cuneiform
  • 86.6%
  • Deep, dorsal portion of tendon

Divisions can be seen extending proximally to level of calcaneocuboid joint

• Fan-shaped, striated

http://www.wesnorman.com/sidefoot.htm
Peroneus Longus Insertion

Additional slips

- MT2-5 bases
- MT1 neck
- First dorsal interosseus muscle
- May receive a contribution from PTT
Normal Peroneus Longus Insertion

Plantar Lis franc lig

Interosseous Lis franc lig
Ganglion Cyst
Sling concept

- Peroneus longus and Tibialis anterior insert at their respective tuberosities at the **inferolateral** and **inferomedial** bases of MT1.
- Both also insert onto medial cuneiform.
- Insertions of the two tendons do not interdigitate.

- **Antagonistic effects**
  - PL: Plantarflex (weak) and Evert (strong) ankle, Plantarflex first ray
  - TA: Dorsiflex ankle, Adduct and Supinate foot
First Metatarsocuneiform Joint

- Has its own synovial encapsulation
- Dorsal and plantar ligaments
  - Plantar stronger
- No interMT ligament btw MT1 and MT2
- Weightbearing
  - MT1 bears 1/3 of static stress, rest divided among lesser MT’s
- Generally considered immobile
- No consensus about what is considered hypermobile on either the direction or amount of movement (Mason 15-19)
Where does Peroneus Longus Fit?

- Young et al (1910) - Described **hypertrophy of the tuberosity** to which PL inserts in setting of **hallux valgus**

- Bohne et al (1997) - Study of 10 cadaveric feet showed PL to be more important than any other component (skin, interMT lig, adductor hallucis brevis) in **resisting varus displacement of MT1**.

- Faber et al (1999) - Study of 9 cadaveric feet showed that PL **resists dorsal displacement of MT1**, but not against medial displacement.
## Motion at the First Metatarsocuneiform Joint

<table>
<thead>
<tr>
<th>Sample size</th>
<th>Medial-Lateral (Transverse)</th>
<th>Dorsi-Plantar (Sagittal)</th>
<th>Inversion-Eversion (Coronal)</th>
<th>Intermetatarsal Joint/Facet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faber et al 1999</td>
<td>9</td>
<td>TMT1 contributes 82% to 2.2° medial displacement of the first ray.</td>
<td>TMT1 contributes 57% to 2.4° dorsal displacement of the first ray.</td>
<td>--</td>
</tr>
<tr>
<td>Fritz et al 1995</td>
<td>100</td>
<td>--</td>
<td>ROM 4.37° in sagittal plane.</td>
<td>--</td>
</tr>
<tr>
<td>Geng et al 2015</td>
<td>40</td>
<td>Medial 0.96° vs. 2.65° in healthy vs. hallux valgus. No lateral motion.</td>
<td>Dorsiflexion 1.18° vs. 2.91° in healthy vs. hallux valgus.</td>
<td>--</td>
</tr>
<tr>
<td>Lundberg et al 1989</td>
<td>8</td>
<td>Medial 2.3° Lateral 2.9°</td>
<td>Significant dorsal displacement (5.9mm) only after cutting the plantar first metatarsocuneiform ligament.</td>
<td>Eversion 1.6°</td>
</tr>
<tr>
<td>Mizel et al 1993</td>
<td>12</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Ouzounian et al 1989</td>
<td>10</td>
<td>--</td>
<td>ROM 3.5°</td>
<td>ROM 1.5°</td>
</tr>
<tr>
<td>Wanivenhaus et al 1989</td>
<td>100</td>
<td>Motion in 11 of 100 feet. 4.4° abduction, 5° adduction.</td>
<td>Dorsiflexion in 9 of 100 feet, 4.3°.</td>
<td>Negligible. Motion only with ligament or joint degen.</td>
</tr>
</tbody>
</table>

**THE CONTROVERSY**
Hypermobility at TMT1 Joint as a Result of Hallux Valgus, rather than a Cause?

- Coughlin and Shurnas (2003) found normal first ray mobility (5mm) following TMT1 joint-sparing surgery for hallux valgus.
- Coughlin et al (2004) cadaveric study found normalization of first ray sagittal mobility (11mm to 5mm) following TMT1 joint-sparing surgery for hallux valgus.
- Rush et al (2000) showed that decreasing the first intermetatarsal angle improved first ray stability without a joint sacrificing procedure.
- Sarrafian (1987) raised importance of plantar aponeurosis in first ray stability.
- Grimes and Coughlin (2006) found generalized ligamentous laxity, including TMT1 joint, following MTP1 arthrodesis for hallux valgus, but clinical improvement. But Coughlin et al (2005) found that patients did not develop ligamentous laxity.

- Difficulty isolating motion at TMT1 joint for measurement

- Variation of osseous anatomy
  - Presence of interMT facet at MT1 base
  - Shape of MT1 base articular surface
Tendinosis
PL Avulsion + Lisfranc Ligament Injury
Summary

• PL origin has tendinous and muscular components, and forms a musculotendinous arch for CPN.
• Muscle tear uncommon, but caution lateral compartment syndrome.
• Long tendon traverses 3 fibro-osseous channels.
  – Enclosed by tendon sheaths (common sheath with PB, separate sheaths at cuboid and plantar foot). Tenosynovitis may occur from multiple causes (stenosis, injury, systemic...).
  – Anchored by SPR and IPR, although intrasheath subluxation may occur
  – Fibrocartilaginous composition at pulleys is an adaptive feature that has implications for tendon degeneration, injury, and repair.
  – Variations of bone morphology predispose to tendinosis and tears.
• Tendon tears usually occur from level of fibula to cuboid, longitudinal split, chronic attritional.
• Tendinopathy may also involve distal PL, which contributes to TMT1 joint stability and has a close anatomic relationship with Lisfranc ligament complex.
Thank You
References

References

References

• Sammarco GJ. Peroneus longus tendon tears: acute and chronic. Foot Ankle Int. 1995 May;16(5):245-53.