JOINTS & ARCHES OF THE FOOT

BY

DR ABULMAATY MOHAMED

ASSISTANT PROFESSOR

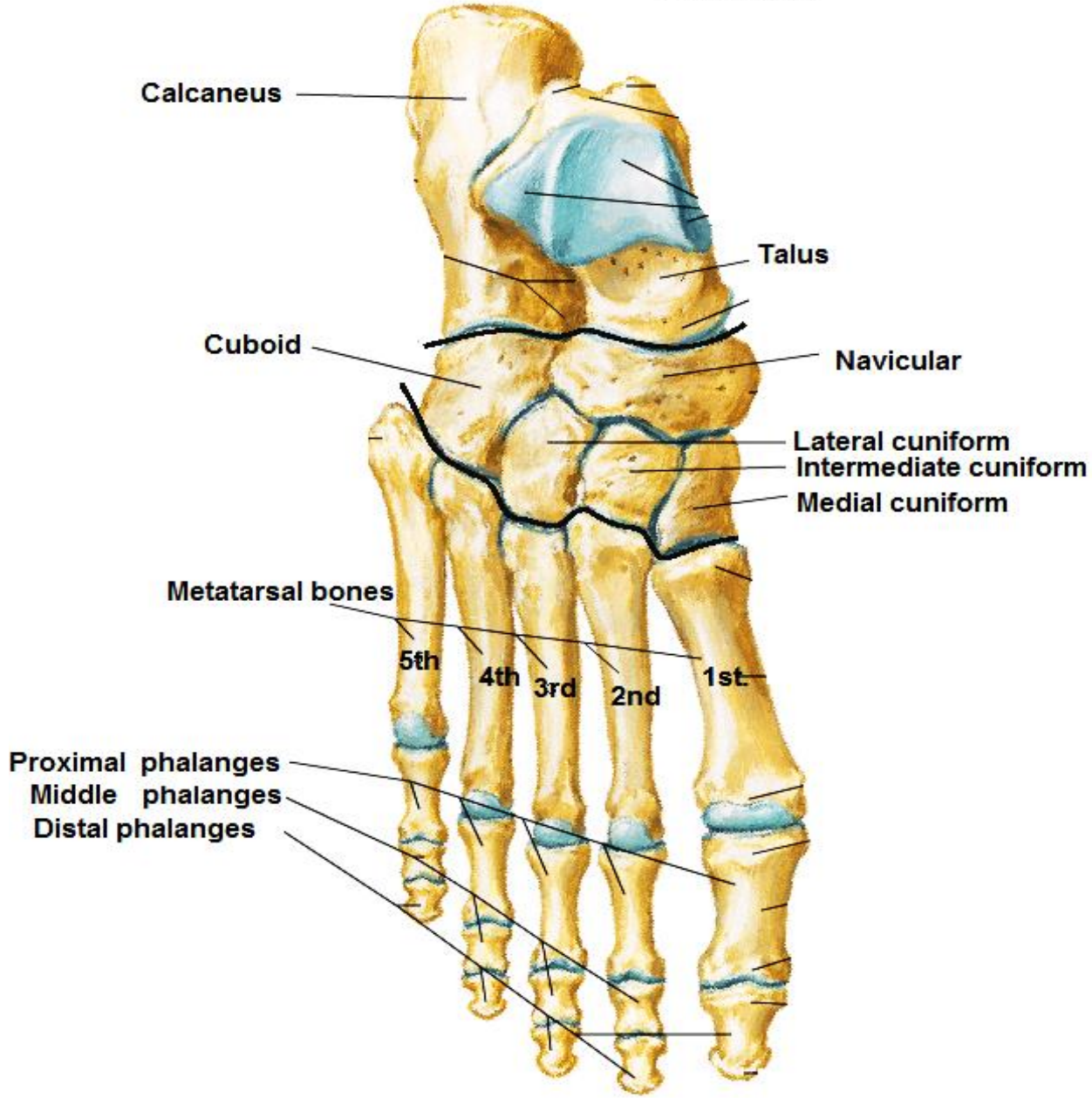
ANATOMY & EMBRYOLOGY

MUTAH UNIVERSITY

JOINTS OF FOOT

Bones of Foot

Dorsal View



JOINTS OF FOOT

1- SUBTALAR JOINT

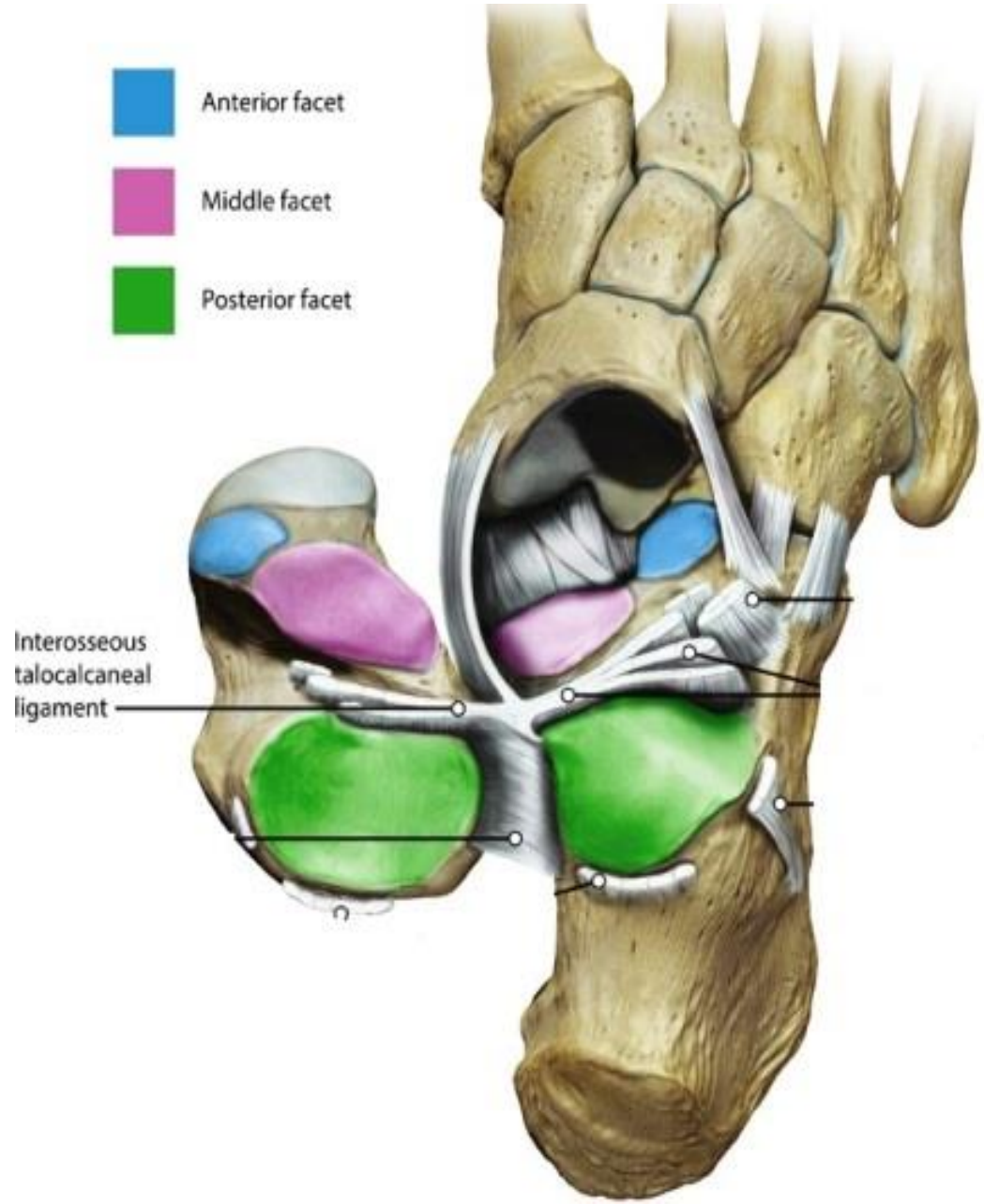
Type: synovial

variety: plane

Articular parts:

lower surface of body of talus

upper surface of calcaneus



JOINTS OF FOOT

2- TALOCALCANEONAVICULAR JOINT

Type: synovial

variety: Ball & socket

Articular parts:

a- Ball:- is formed by the head of the talus.

b- Socket:- is formed by

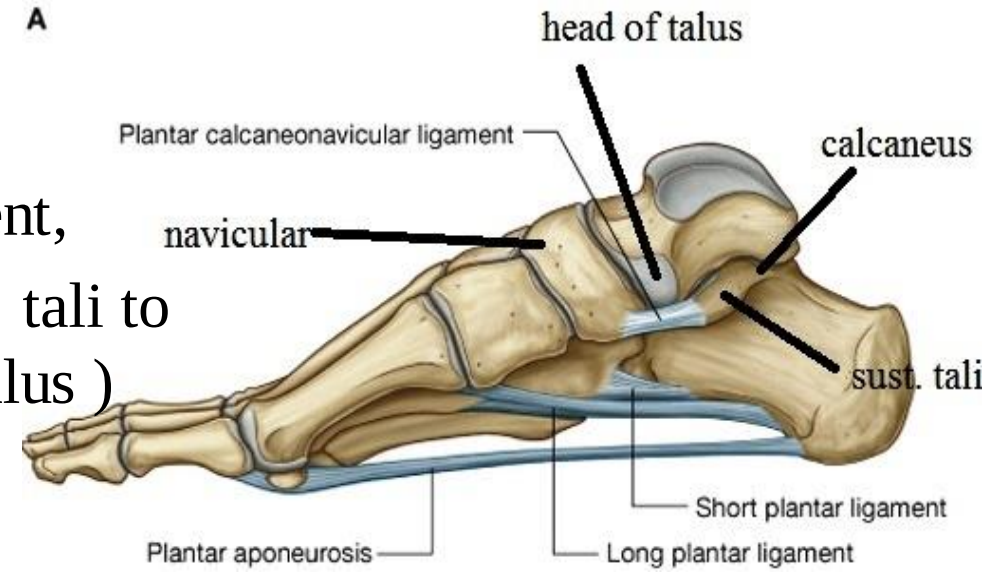
- navicular bone,

-upper surface of the spring ligament,

(which extends from sustantaculum tali to navicular bone it support head of talus)

-sustentaculum tali,

-superior surface of the calcaneus



JOINTS OF FOOT

Movements

1- Inversion

-medial rotation of the foot so the sole looks inwards

- It is done by

a) Tibialis anterior

b) Tibialis posterior.

2- Everson:

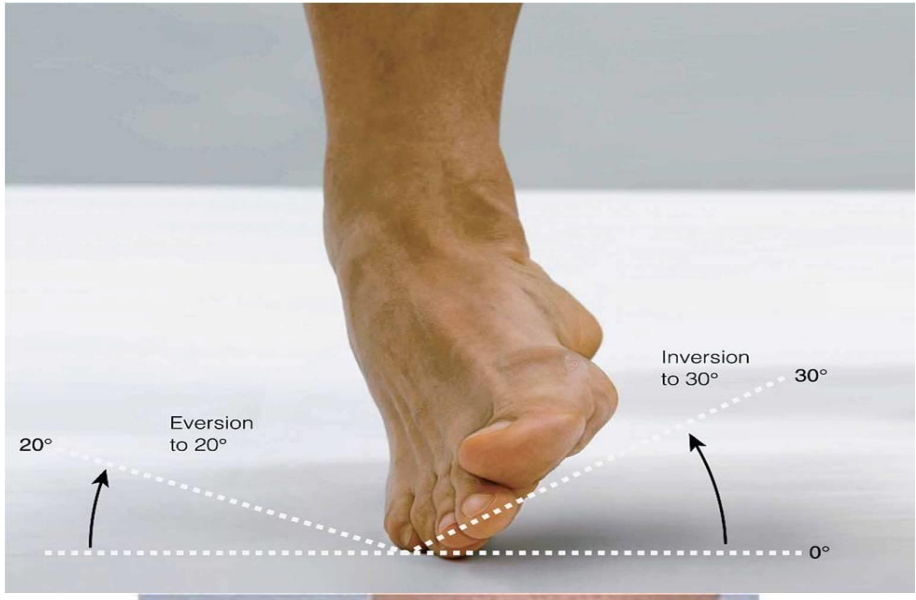
-Lateral rotation of the foot so the sole looks outwards

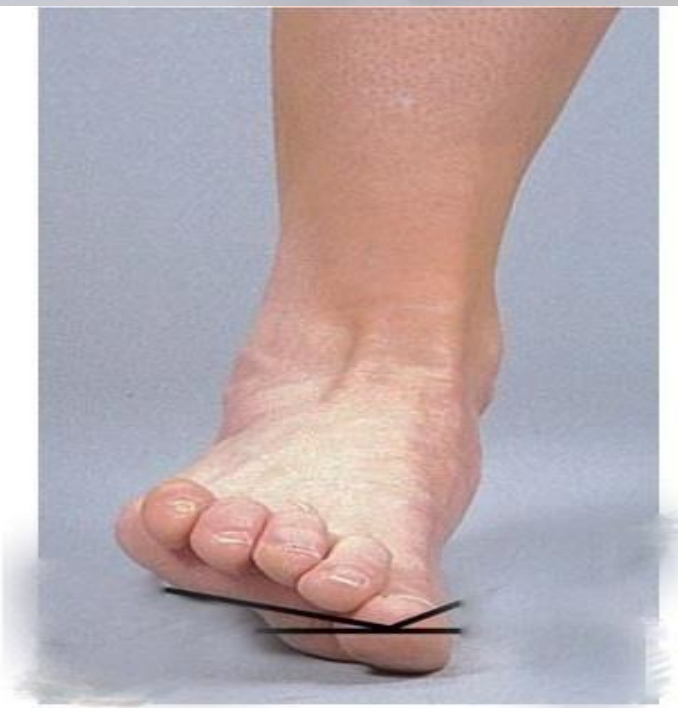
-It is done by

a) Peroneus longus.

b) Peroneus brevis.

c) Peroneus tertius.





eversion

ARCHES OF FOOT

IMPORTANT LIGAMENTS OF THE SOLE

1- spring ligament

2- short plantar ligament

(plantar calcaneo cuboid)

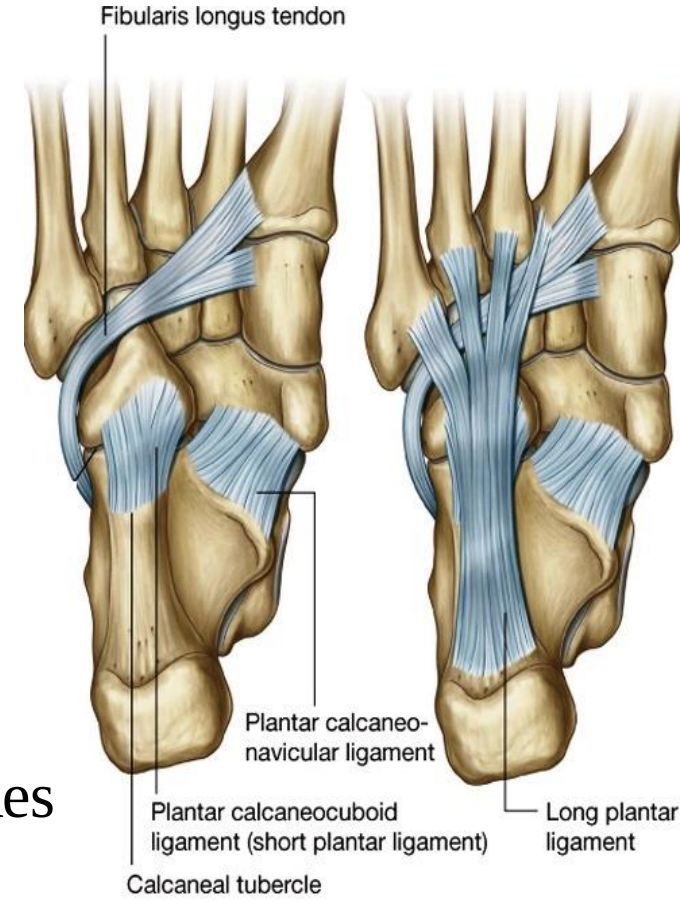
Extends from the anterior part of calcaneus to the cuboid

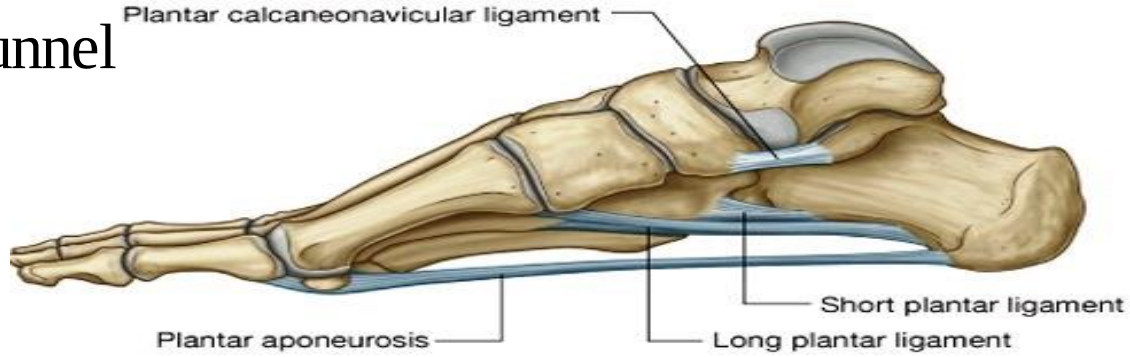
3-long plantar ligament

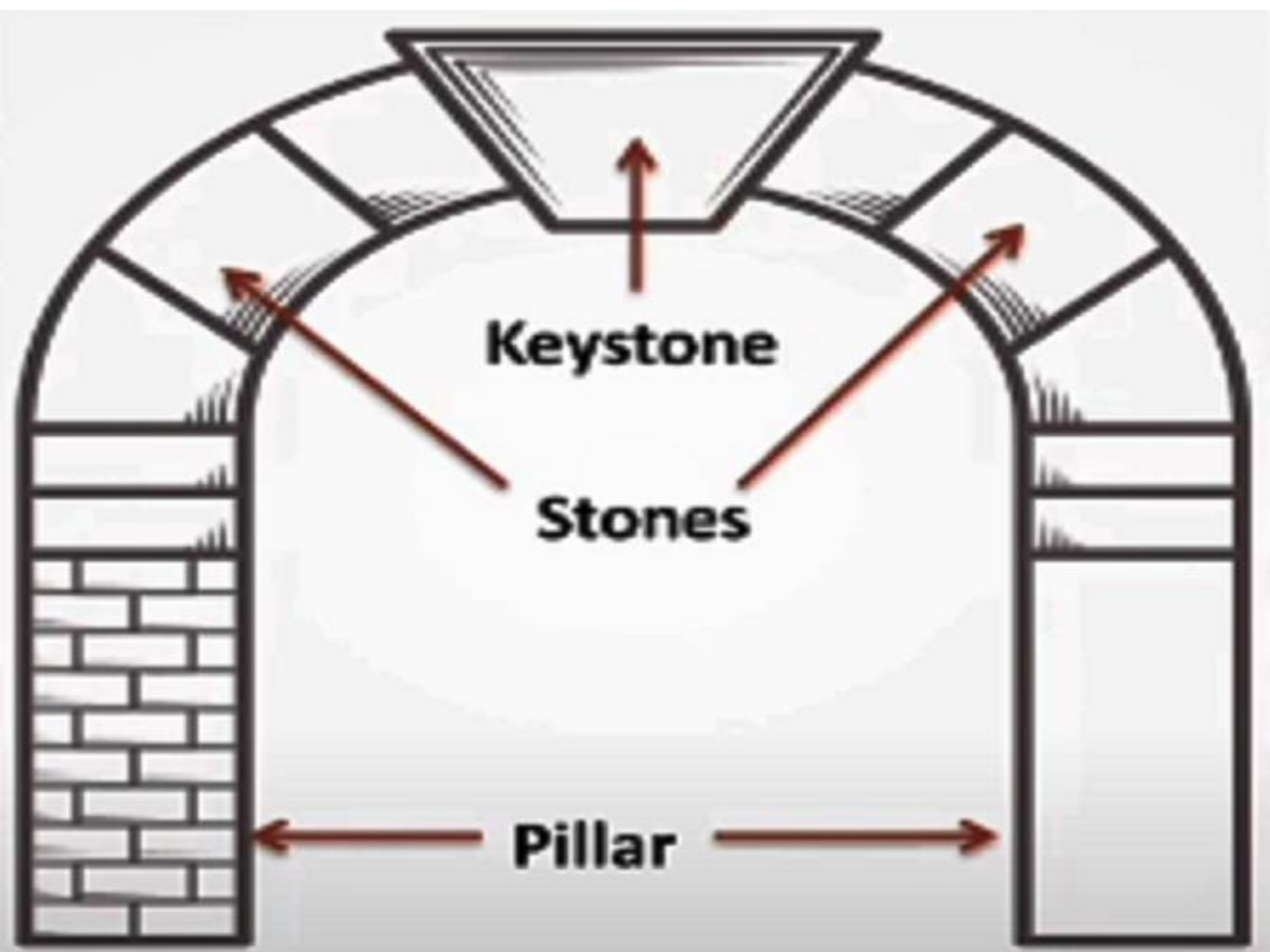
-strongest in the sole

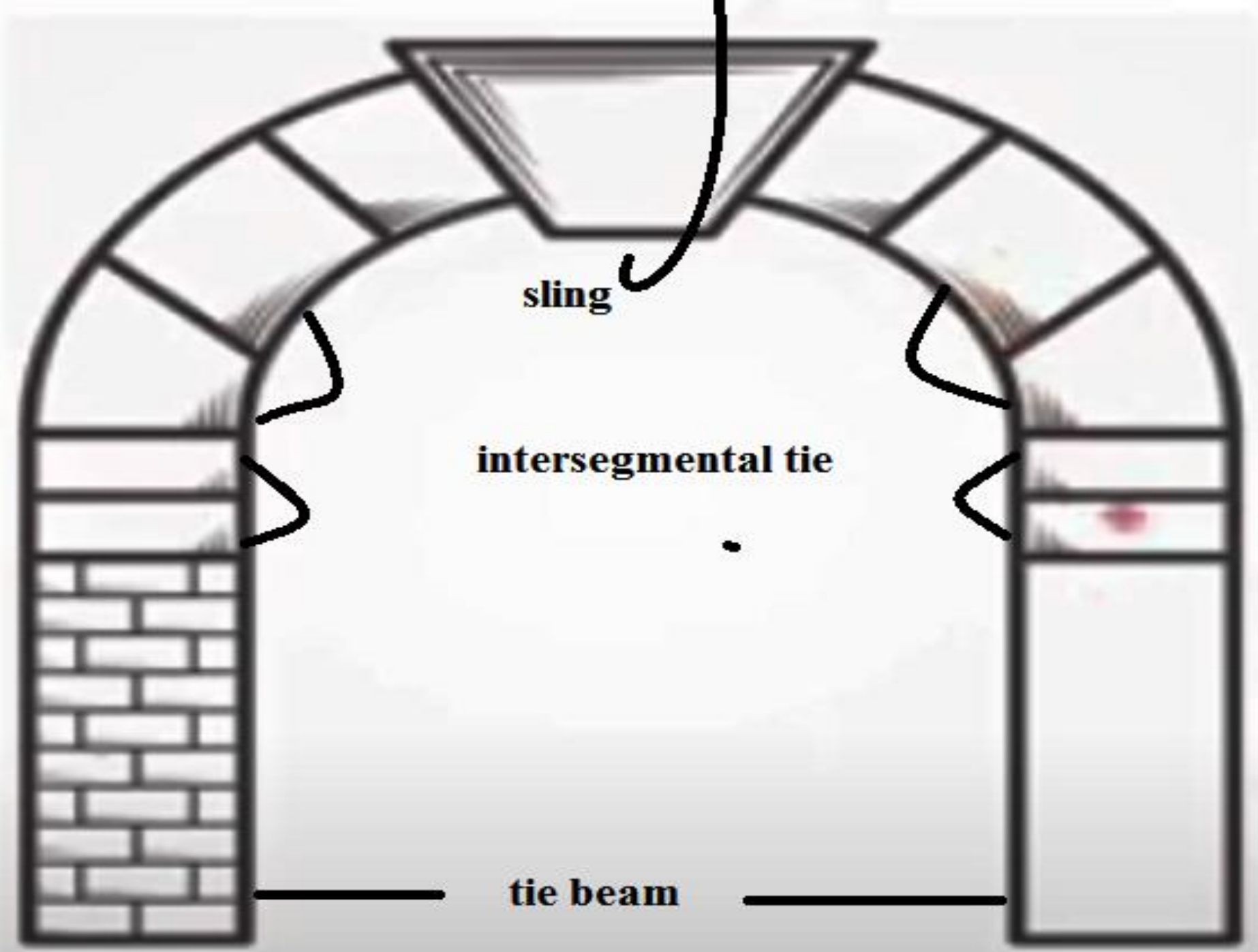
-Extended from posterior part of the calcaneus to bases of 2nd ,3rd, 4th metatarsal bones

-Crosses the plantar surface of cuboid converting its groove into a tunnel for peroneus longus






Keystone
Stones
Pillar


sling
intersegmental tie
tie beam

CLASSIFICATION OF ARCHES OF FOOT

1-Medial longitudinal arch:-

higher than the lateral one

2- lateral longitudinal arch :-

3-Transverse arch

1-MEDIAL LONGITUDINAL ARCH

Construction:-Formed by 9 bones.

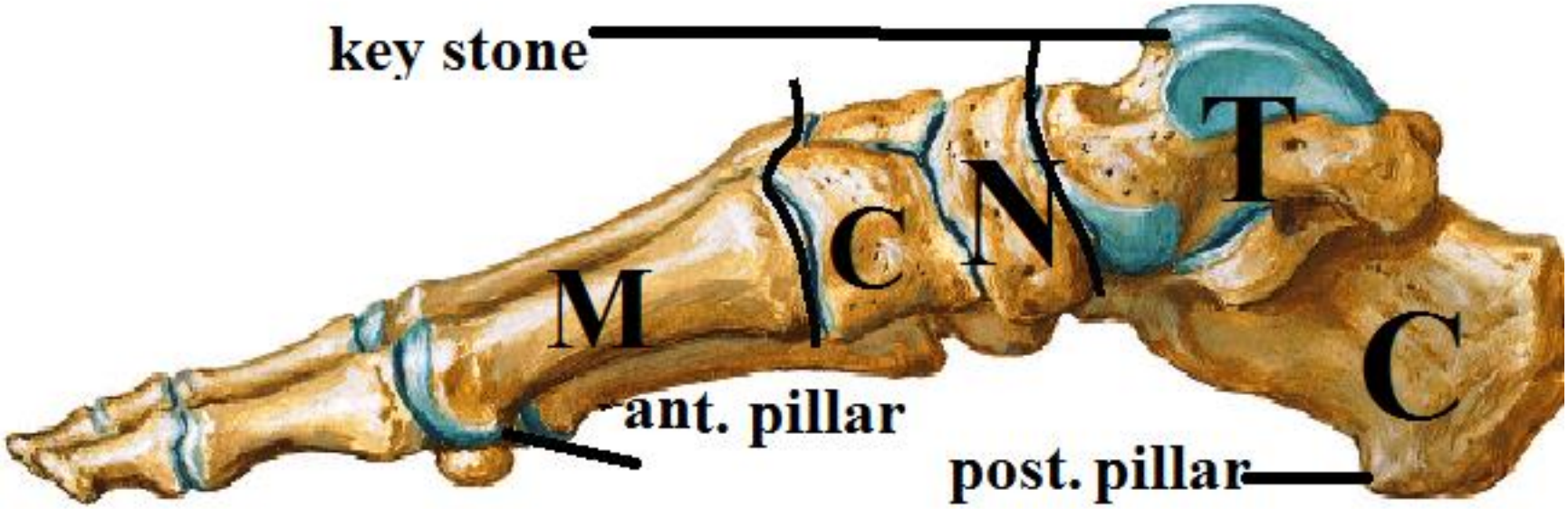
Calcaneus, talus, navicular, 3 cuneiforms and med, 3 metatarsals

pillars

Ant. pillar: Heads of med. 3 metatarsal bones.

Post. pillar: calcaneus

Key stone: body of talus



1-MEDIAL LONGITUDINAL ARCH :

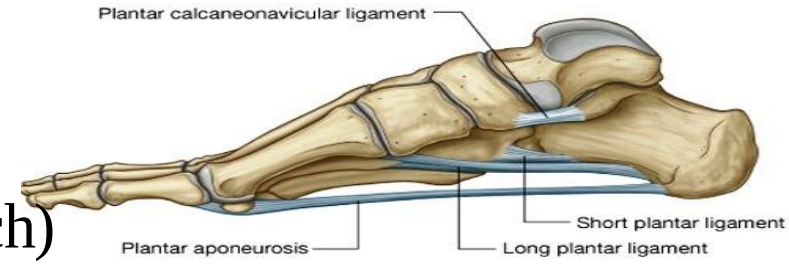
Factors maintaining the arch

1-Bony factor : most of the bones are wedge shaped.

2- inter-segmental ties: (uniting the different segments of the arch)

Ligaments : e.g. :Spring ligament

interosseous ligaments



3-tie beams: (connecting the ends of the arch)

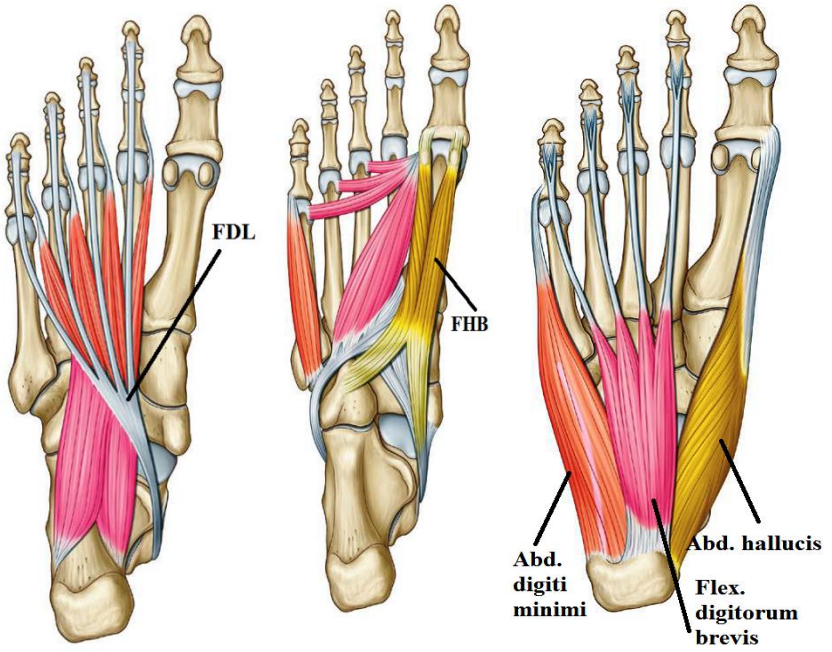
Ligaments : e.g. Plantar aponeurosis

Muscles: e.g. abd. Hallucis

flexor hallucis brevis

flexor digitorum brevis

flexor digitorum longus



1-MEDIAL LONGITUDINAL ARCH :

Factors maintaining the arch

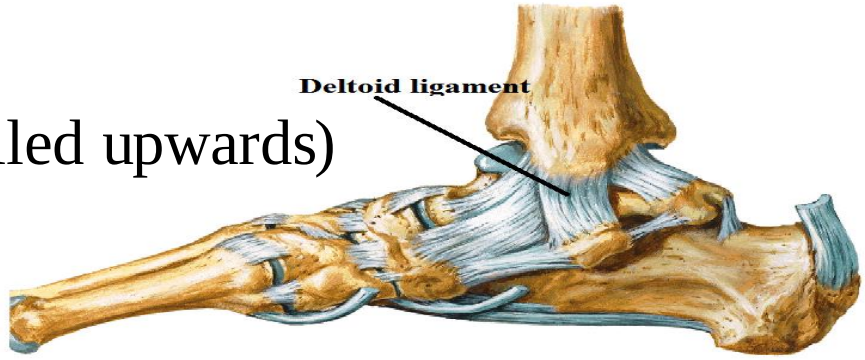
4- slings :- (maintain the key stone pulled upwards)

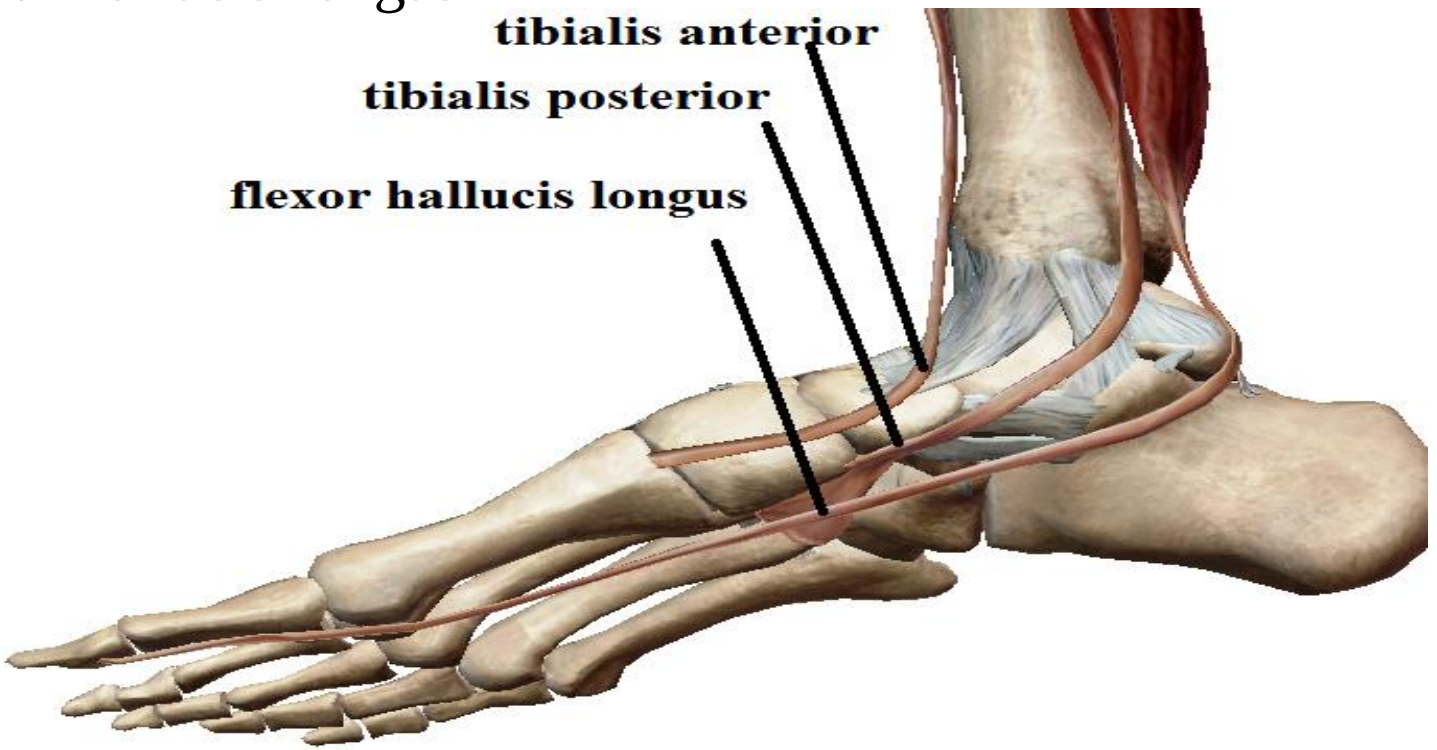
Ligaments : e.g. deltoid ligament

Muscles: e.g. Tibialis ant.

Tibialis posterior

flexor hallucis longus





2- LATERAL LONGITUDINAL ARCH

Construction:- Formed by 4 bones

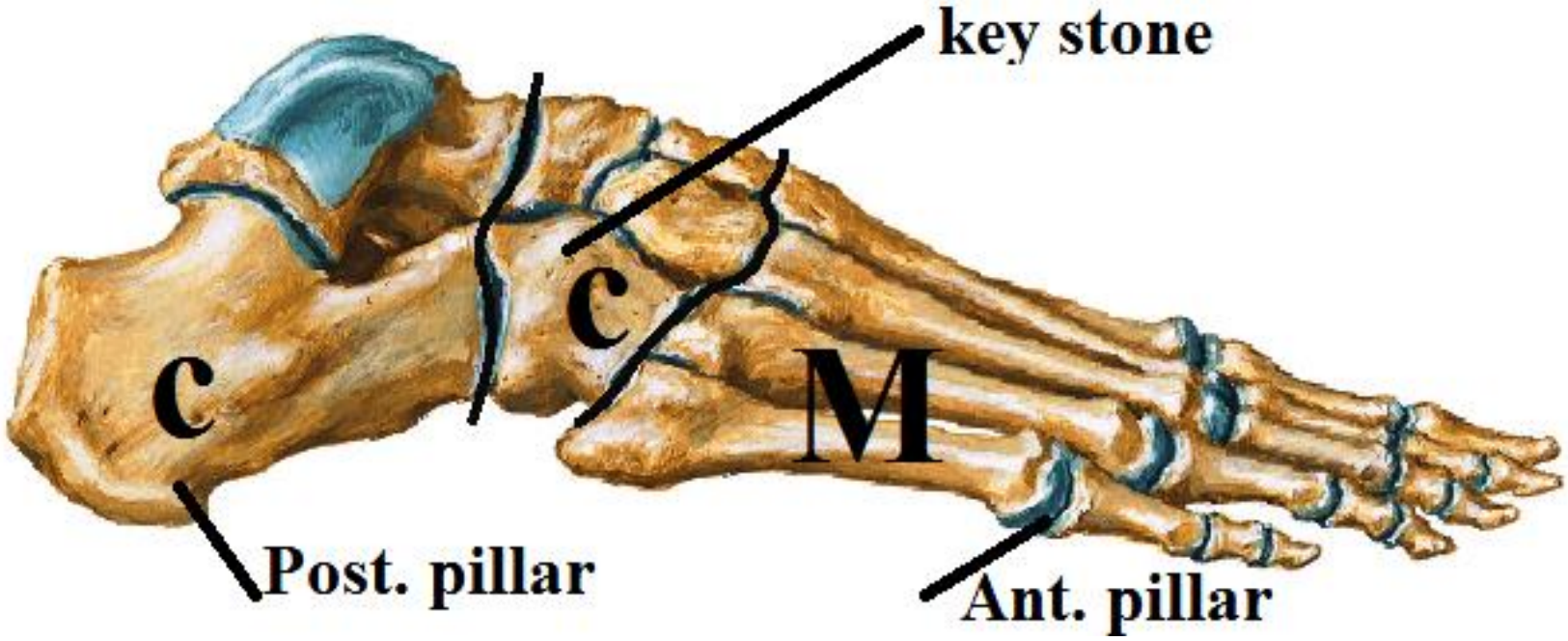
calcaneus, cuboid , 4th and 5th metatarsal bones.

pillars:

Ant. pillar : heads of 4th and 5th metatarsal bones.

Post. pillar; calcaneus

Key stone : cuboid



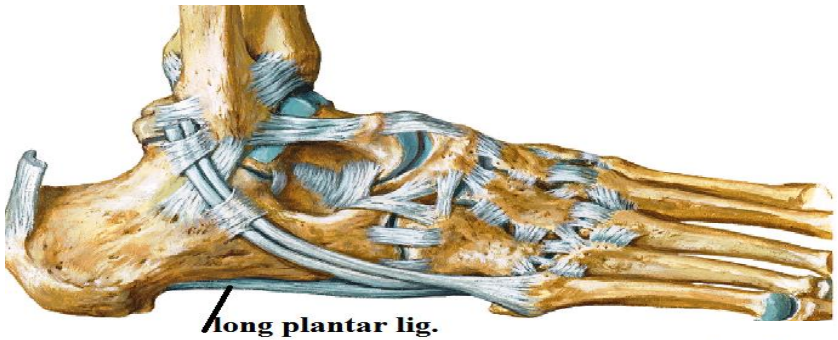
2- LATERAL LONGITUDINAL ARCH :

Factors maintaining the arch

1-Bony factor : most of the bones are wedge shaped.

2- inter-segmental ties:

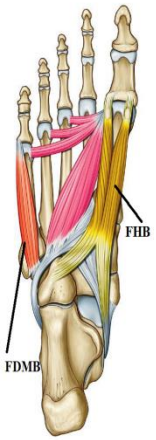
Ligaments : e.g. :short plantar ligament
long plantar ligament
interosseous ligaments

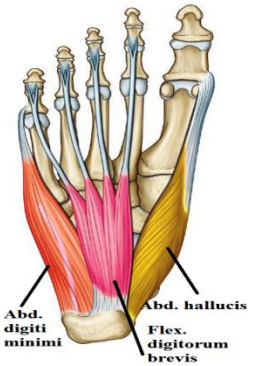


3-tie beams:

Ligaments : e.g. Plantar aponeurosis

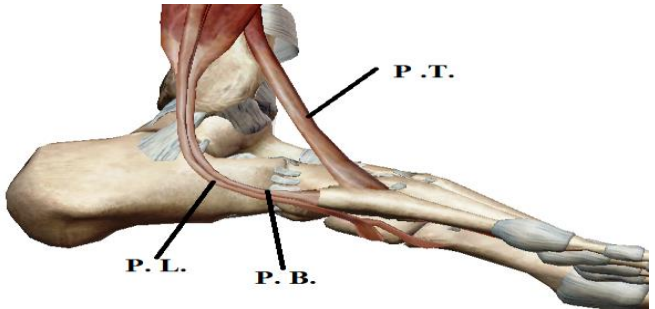
Muscles: e.g. abd. Digiti minimi
flexor digiti minimi brevis





4- slings :-

Muscles: e.g. peroneus longus
peroneus brevis.
peroneus tertius



3-TRANSVERSE ARCHES

Construction : Formed by

metatarsal bones , cuboid , the 3 cuneiform bones

Factors maintaining the arch

1-Bony factor : the bones are wedge shaped.

2- inter-segmental ties:

Ligaments: e.g. deep transverse metatarsal ligament

muscles : e.g. : interossei muscles .

3-tie beams:

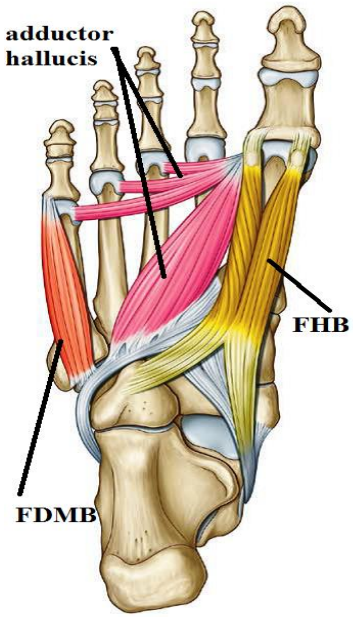
Ligaments : e.g. Plantar aponeurosis

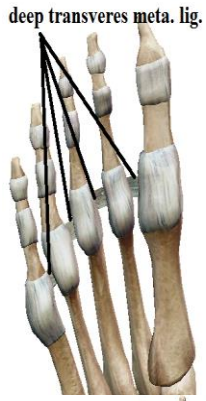
Muscles: e.g. Adductor hallucis

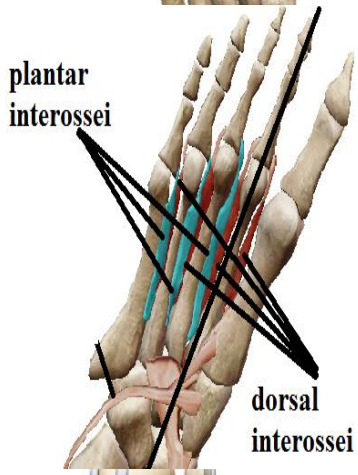
4- slings :-

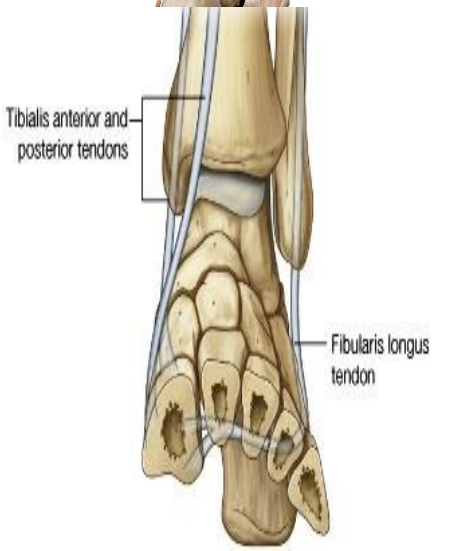
Muscles: e.g. Peroneus longus

tibialis Post









FUNCTIONS OF THE ARCHES

1- Distribution of body weight to weight bearing areas:

Body weight reaching the talus is distributed as follows

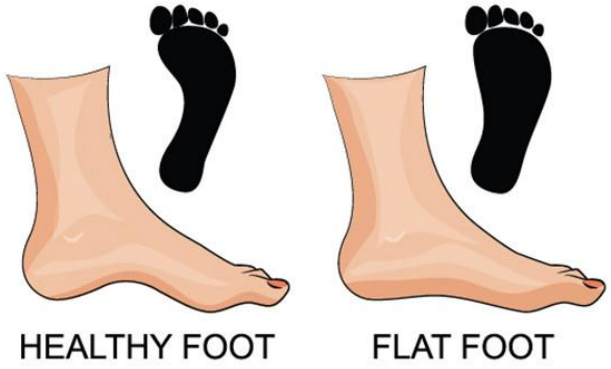
-1/2 the weight is delivered backwards to calcaneus

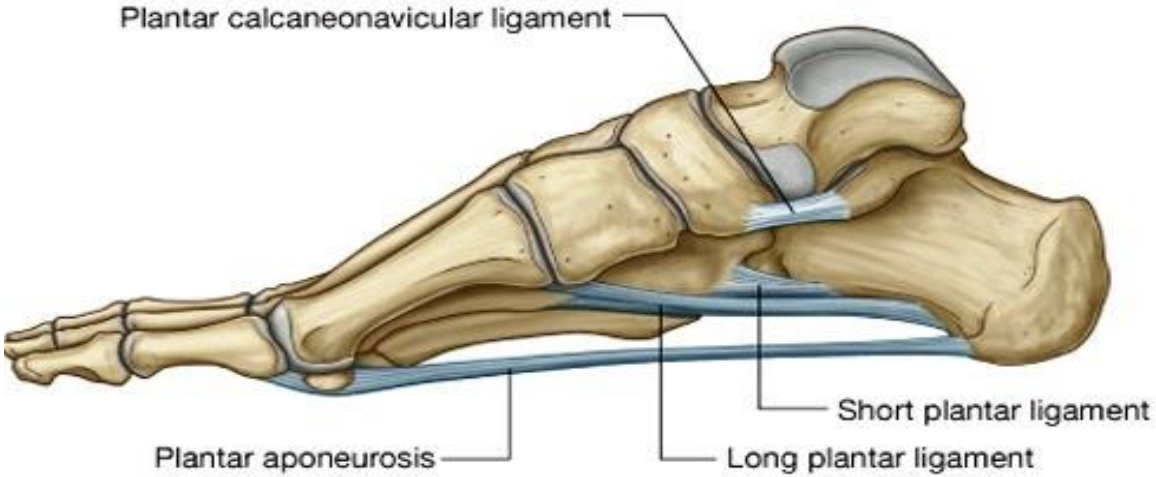
- While the other ½ is delivered anteriorly to heads of metatarsal bones

2- The concavity of the arches protect the soft tissue of sole.

3-Shock absorbers as in jumping.

4-Act as spring which helps in walking and running.





THANQ