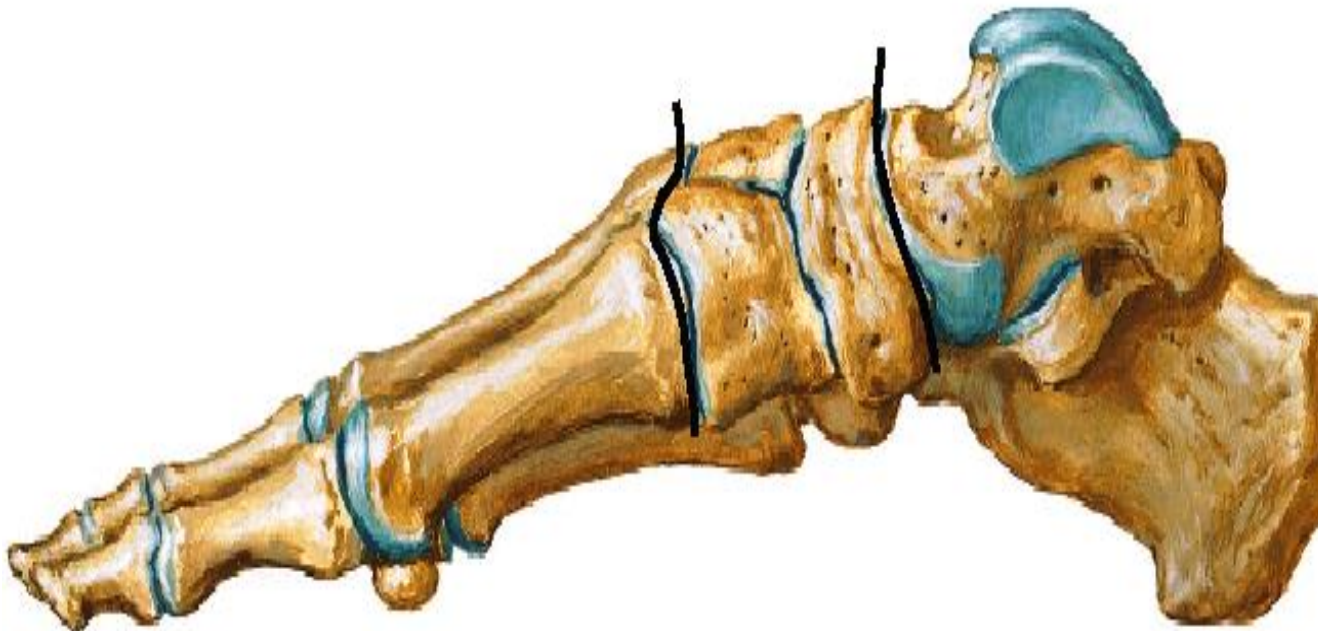


# ARCHES OF THE FOOT

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MUTAH UNIVERSITY



# IMPORTANT LIGAMENTS OF THE SOLE

## 1- spring ligament

## 2- short plantar ligament

### (plantar calcaneo cuboid)

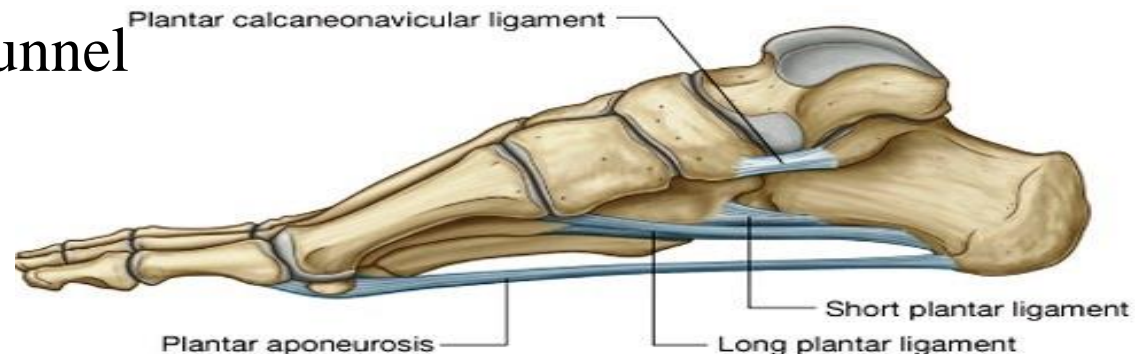
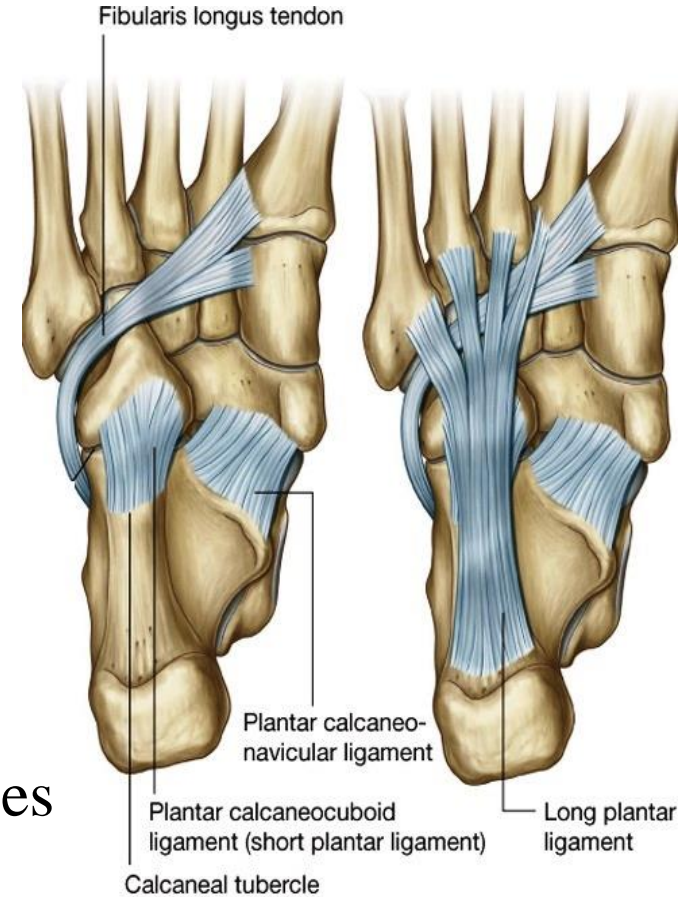
Extends from the anterior part of calcaneus to the cuboid

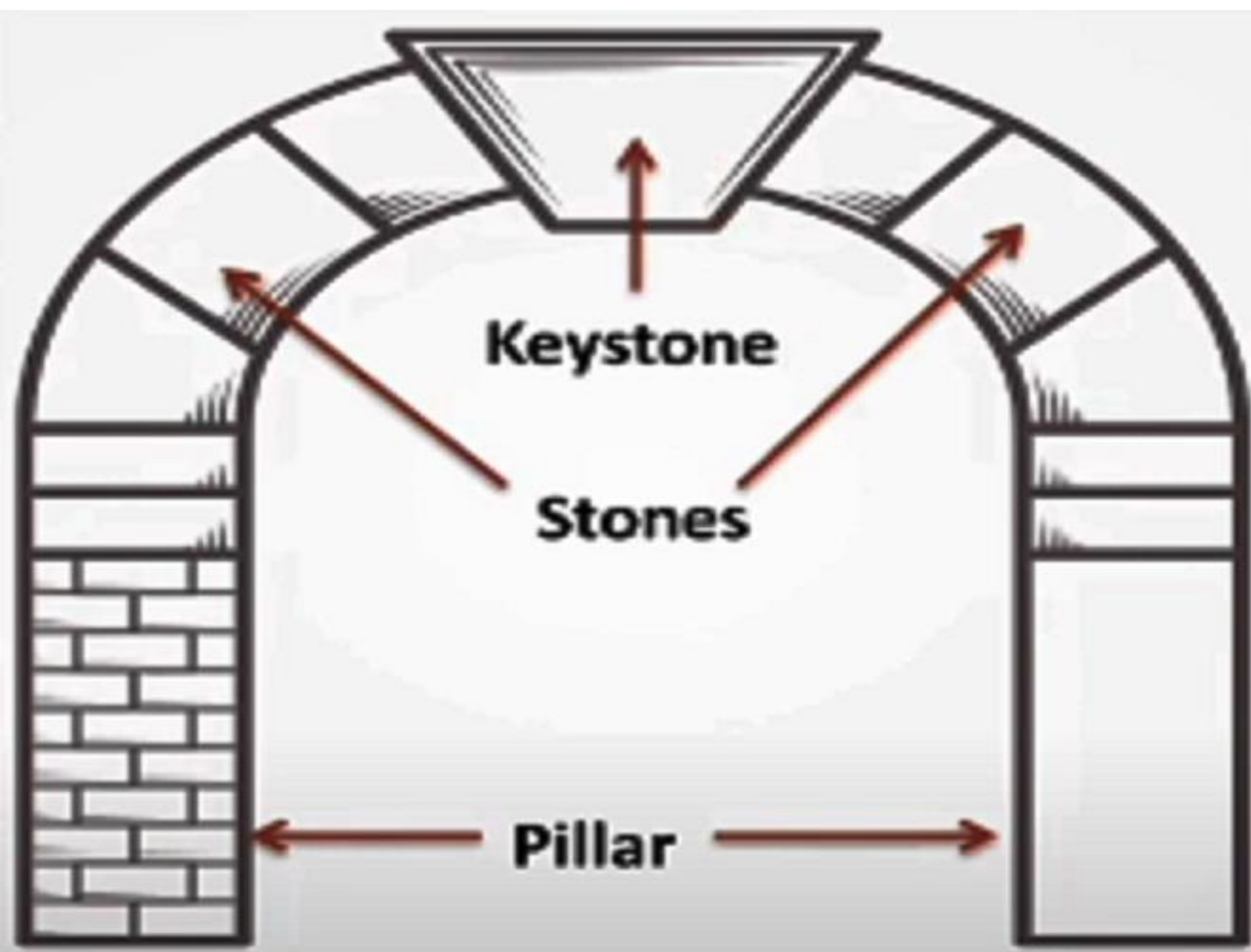
## 3-long plantar ligament

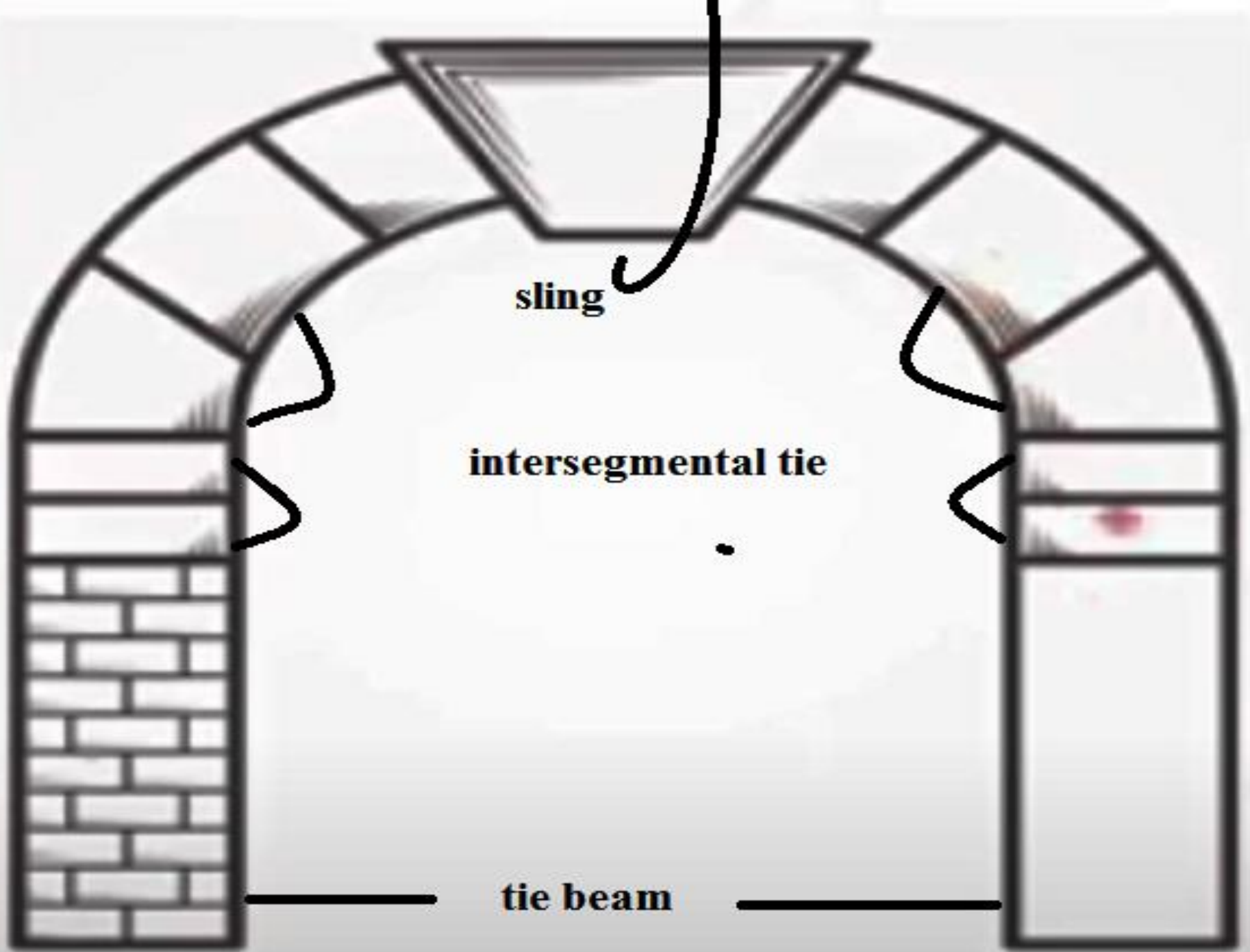
-strongest in the sole

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

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







# 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

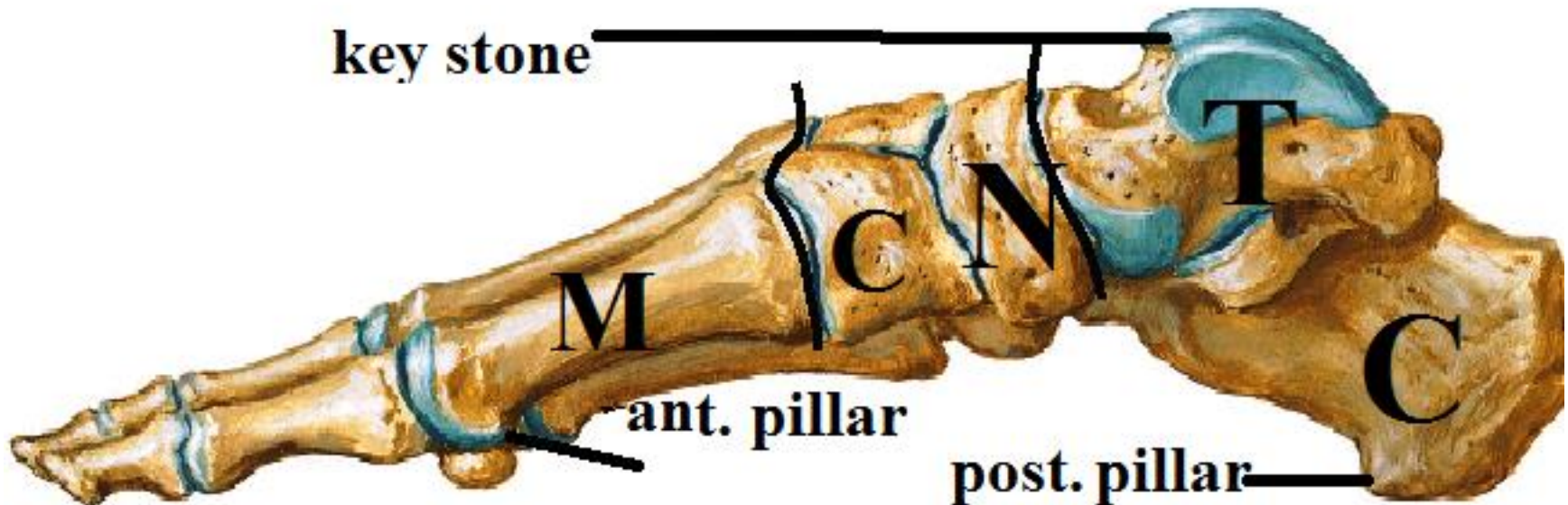
**Construction:-** Formed by 9 bones.

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)

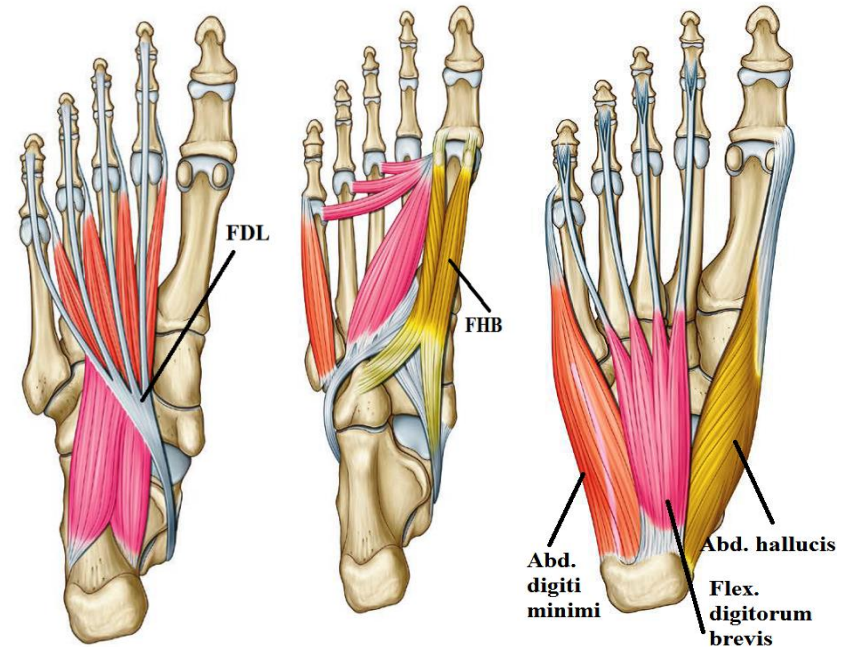
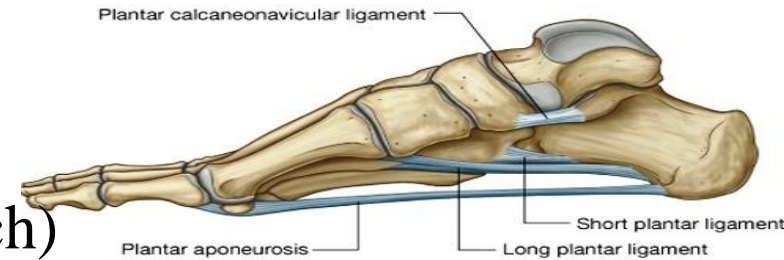
Ligaments : e.g. Plantar aponeurosis

Muscles: e.g. abd. Hallucis

flexor hallucis brevis

flexor digitorum brevis

flexor digitorum longus



# 1-MEDIAL LONGITUDINAL ARCH :

## Factors maintaining the arch

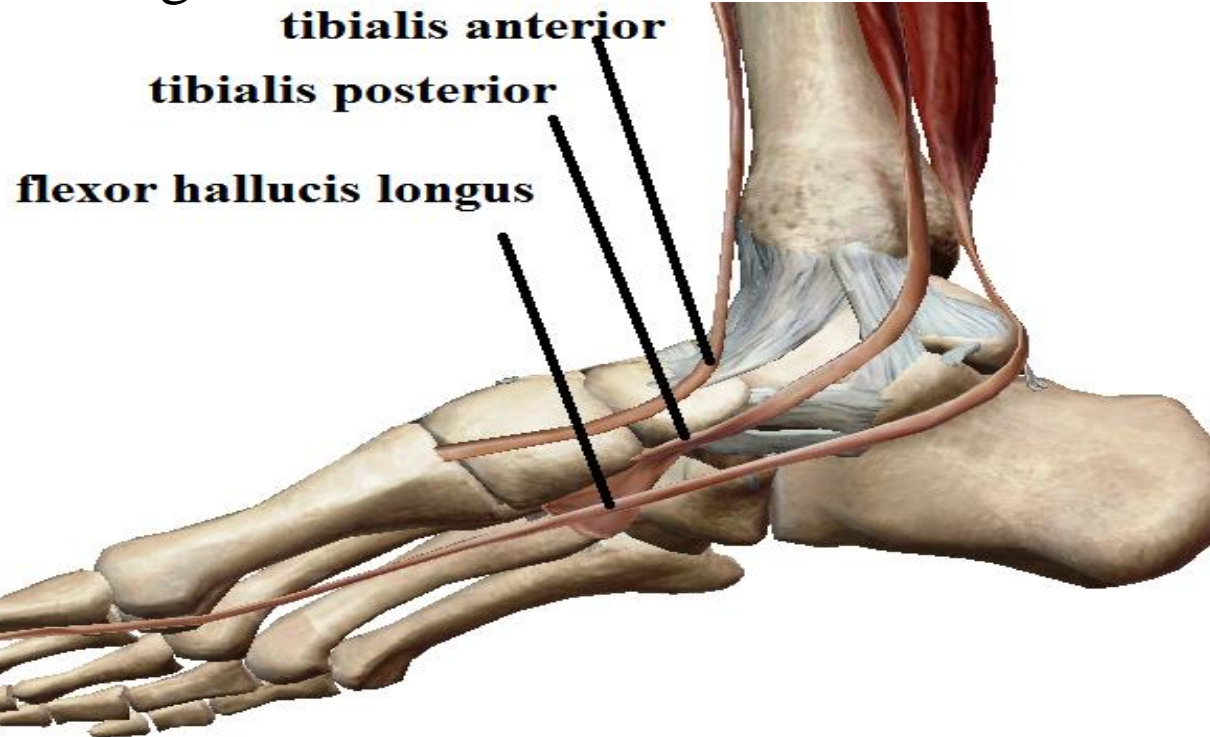
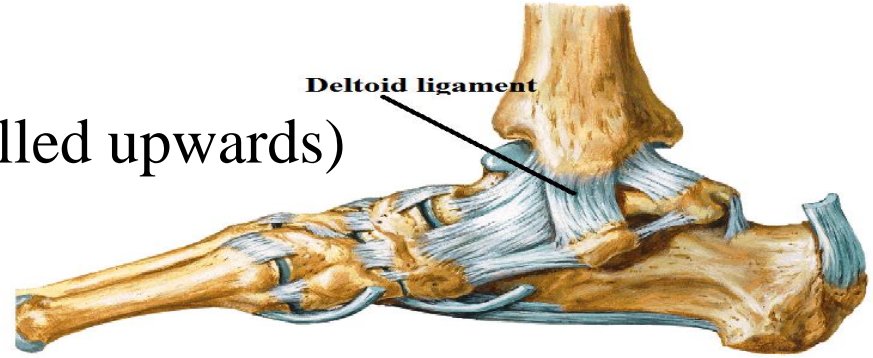
4- slings :- (maintain the key stone pulled upwards)

Ligaments : e.g. deltoid ligament

Muscles: e.g. Tibialis ant.

Tibialis posterior

flexor hallucis longus





# 2- LATERAL LONGITUDINAL ARCH

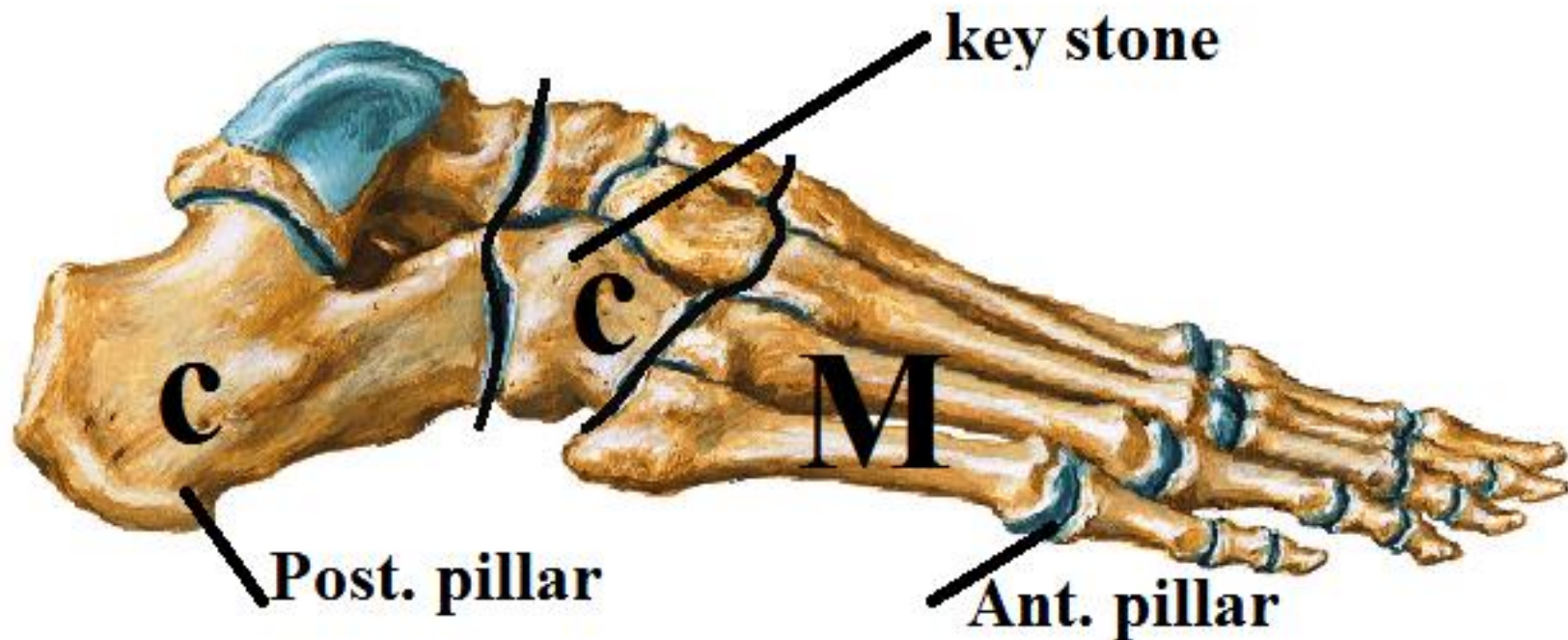
**Construction:-** Formed by 4 bones  
calcaneus, cuboid, 4<sup>th</sup> and 5<sup>th</sup> metatarsal bones.

**pillars:**

**Ant. pillar :** heads of 4<sup>th</sup> and 5<sup>th</sup> metatarsal bones.

**Post. pillar;** calcaneus

**Key stone :** cuboid



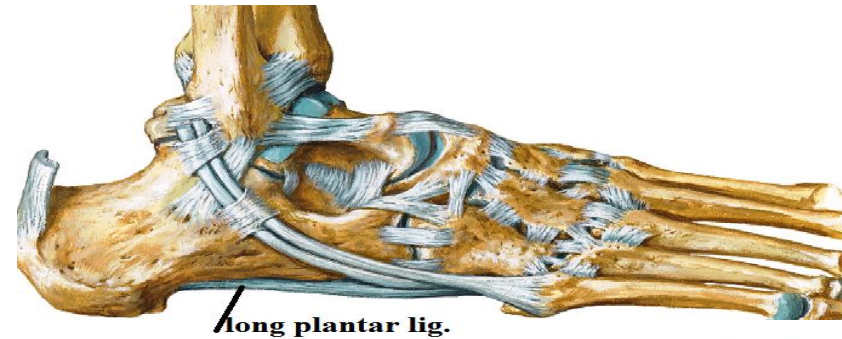
# 2- LATERAL LONGITUDINAL ARCH :

## Factors maintaining the arch

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

2- inter-segmental ties:

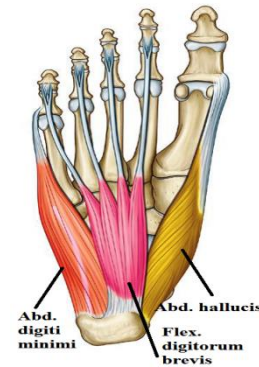
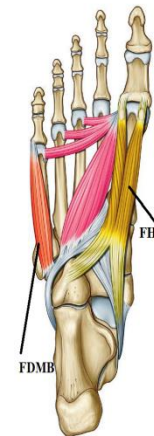
Ligaments : e.g. :short plantar ligament  
long plantar ligament  
interosseous ligaments



3-tie beams:

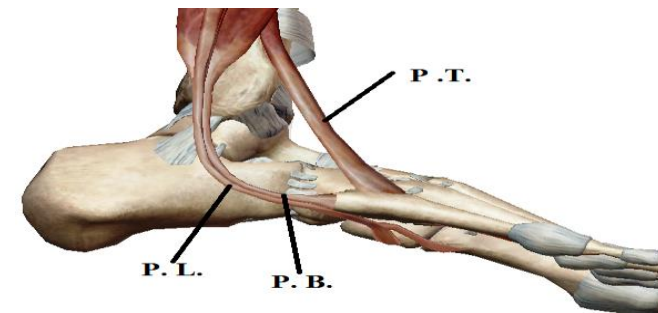
Ligaments : e.g. Plantar aponeurosis

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 .

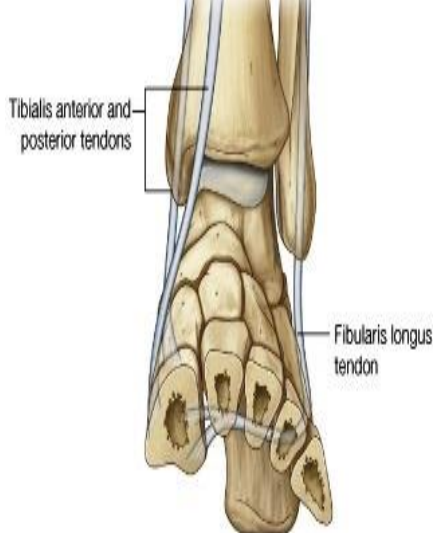
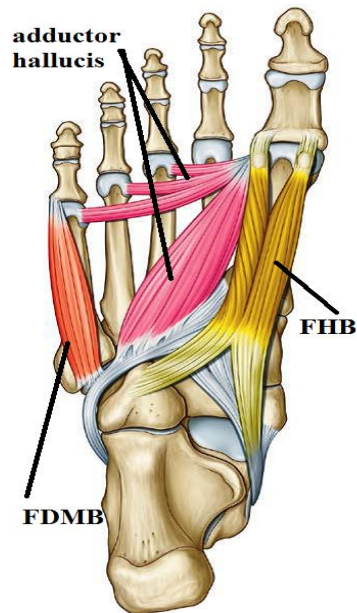
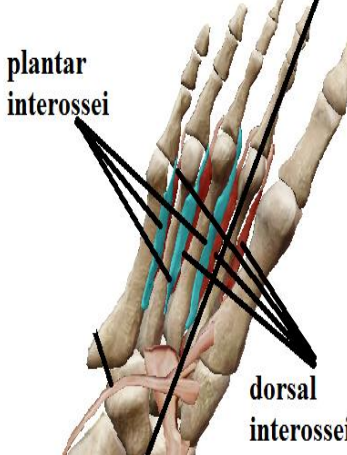
3-tie beams:

**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:

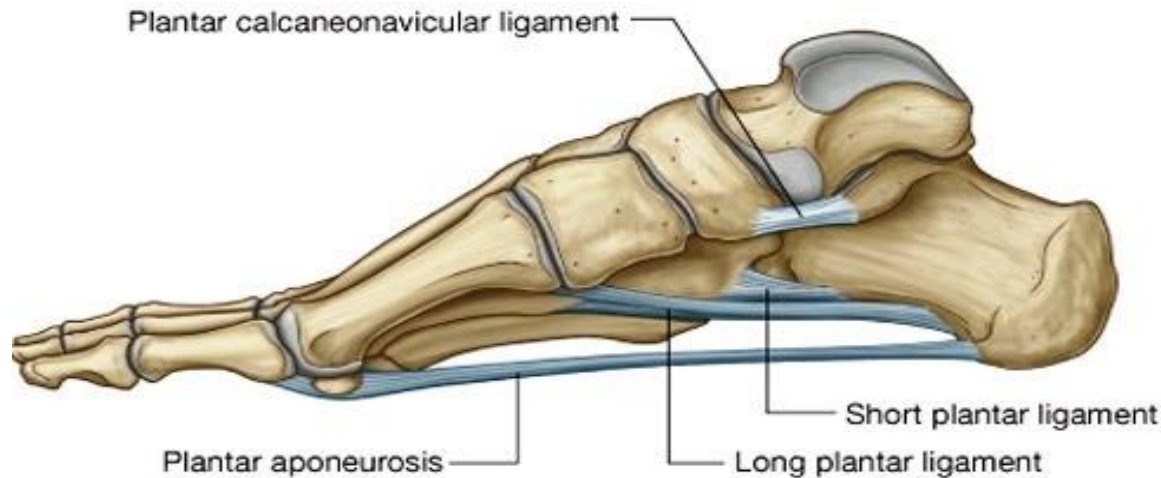
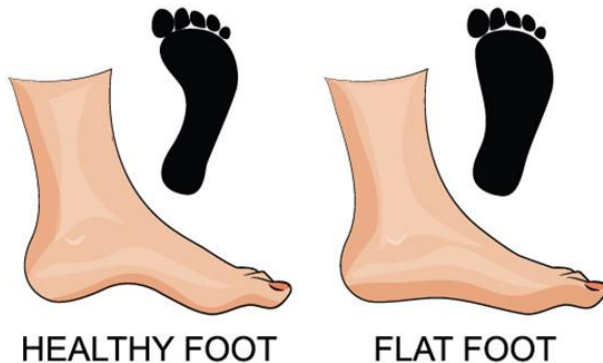
Body weight reaching the talus is distributed as follows

- 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.



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