



QUESTION | What is the treatment of a cuneiform fracture? My son recently did this skiing 6/52 ago. He is currently in a short leg pop nwb. Is surgery ever needed.

ANSWER | The cuneiforms make up three bones in the midfoot. These are the medial, middle, and lateral cuneiforms. These bones interlock with each other and are the bridge between the navicular and the metatarsals. The importance of these bones lies in their solid structure. Strong ligaments attach the navicular bones to each other and to the metatarsals resulting in a very stable medial column of the foot (see figure 1). This stability is extremely important in walking and running, as it allows muscles around the ankle and foot strength to propel the body forward. Functionally, thus, the importance of the cuneiforms lies in their stability. A disruption of this stability may result in a Lisfranc injury.

While stability of the joints around the cuneiforms is very important, why are they then joints? Why don't we have just one big solid bone in the midfoot? The answer is that even though these joints need to be incredibly stable for propulsion in running, they have to have some movements to absorb shock when our feet land. The shock absorption is provided by the small amount of motion in these joints. Like any joints in the body, the flipside of having a joint with motion is that if there is wear and tear, and arthritis develops that pain can ensue. Painful, arthritic joints can be treated by a fusion. In the case of the joints around the cuneiforms, losing motion with a fusion is a small sacrifice when trying to treat painful joints.

There are different types of cuneiform fractures and these are treated differently depending upon their pattern: Extra-articular, intra-articular, or avulsion fractures. An extra-articular fracture that does not involve the joints, which is minimally displaced, can be treated non-operatively to allow to heal. These fractures might be treated with non-weight bearing in a boot for 4-6 weeks, then progress activities with healing.

Intra-articular cuneiform fractures may be treated with or without surgery, depending on the amount of displacement at the joint. With significant displacement, greater than 2mm, surgery would be considered to restore the alignment at the joint to help prevent arthritis. If there is minimal displacement, then these fractures would be treated non-operatively (see figure 2).

Avulsion fractures are tiny fractures at the corners of the cuneiform bone. When avulsion fractures occur in cuneiform bones, these can be worrisome, as they may represent a Lisfranc injury. A Lisfranc injury is a disruption of the ligaments at the tarsometatarsal or inter-cuneiform level which leads to instability of the midfoot. These injuries usually require surgery for a successful outcome. Thus, it is imperative that any cuneiform fracture is assessed for the presence of a Lisfranc injury (see figure 3). Physical examination with palpation and stress of the joints is

done to note areas of tenderness. Weight bearing x-rays of the injured and normal side are compared to check for any instability or widening at the joints. (see figure 4) Stable injuries may be treated nonoperatively as described above.

In summary, all cuneiform fractures are not treated equally. Any fracture of the cuneiform should be assessed by an orthopaedic surgeon to assess for Lisfranc involvement or whether surgical intervention is necessary. Generally, fractures without articular involvement are treated non-operatively, and those they are displaced intra-articular or those that represent a Lisfranc injury need surgery.



Figure 1: Normal anatomy demonstrating cuneiforms (red arrows).



Figure 2: CT scan of midfoot demonstrating a displaced intra-articular fracture.



Figure 3: CT scan demonstrating a displaced cuneiform fracture with a Lisfranc injury.



Figure 4: Weight-bearing x-rays demonstrating a Lisfranc fracture dislocation.