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Triple Joint Fusion (Arthrodesis)

Arthritis is when the cartilage is damaged or worn away and no longer provides the cushion to allow the smooth motion between the bones. Cartilage is unique in that there is no blood flow that provides nutrition, so that when injured it does not have the ability to repair itself very well, unlike bone. This inability to repair itself is why scientists and surgeons have a very difficult time in trying to restore large cartilage defects in the setting of arthritis. When non-surgical options such as injection, braces, and activity modification have not provided sufficient relief, surgery can be considered. Patients with subtalar arthritis have pain that is noted on the side of the ankle/hindfoot and have more difficulty with uneven ground, grass, or gravel. There is no replacement option for this joint and the most effective method to surgically treat arthritis of this joint is a fusion.

A triple fusion is most commonly an outpatient operation and "glues" the four bones that formulate the triple joint complex from where the names originates. The four bones are the talus, navicular, calcaneus, and cuboid. Fusion of these bones is not simply for arthritis, in many cases a deformity is present, a significantly collapsed arch or a very large arch (cavus foot). In situations where the joints in the back of the foot are causing pain and are not mobile, a triple fusion may be considered. The goal of the fusion is to make the body connect these bones that were previously separated by cartilage with solid bone. The bones can also be realigned during this procedure to help correct deformity to create a more neutrally aligned foot. Normally, two bones are separated by cartilage also known as a joint. Arthritis causes normal cartilage to be worn out and causes painful bone on bone motion in the joint. With fusion, two bones are fused into one bone in order to eliminate any motion/joint as the two bones become one larger bone, resulting in pain relief. However, the major downside of a fusion is the loss of motion of the hindfoot. The joints involved in this fusion constitute all of the the side to side motion of foot and therefore complete loss of side to side motion will occur after this procedure. In patients who have a very stiff joints, the loss of function is minimal for them as they have not had motion in their hindfoot for years. Patients who have a lot of hindfoot motion (side to side) will notice the stiffness after surgery following a fusion.

We use an open approach with two primary incisions to ensure the joints are positioned appropriately and the deformity is corrected so that the foot is in a neutral position. The remaining cartilage is removed and bone is "prepared" to get the fusion to heal. Preparation of the bones means that small drill holes and microfractures are made to stimulate bone healing and bone graft is added to maximize the chance of a fusion. Multiple screws, surgical staples, and/or plates are commonly used to hold the bones in the right position and held together. Over time the bones will heal - and this is the successful fusion that we hope for. If there is significant bone loss that may occur from trauma or long-standing deformity a larger bone graft that is structural to restore the height and anatomy of the foot may be required. In this particular case, the period of no pressure on the foot (non-weightbearing) may be increased from 6 weeks to 3 months given the complexity of healing required. The screws are not actually holding the bone together in the long-term, it is the new bone that has formed between the talus and calcaneus and this is why it can last a lifetime once healed.

Following surgery, a successful fusion occurs in the majority of patients resulting in relief of pain. Patients are able to walk, bike, swim without significant difficulty in most cases. Shoewear has some limitations, but any comfortable athletic shoe and occasionally fashionable shoes for short time periods can be used. Over time, average of 20 years, patients may develop arthritis in the joints surrounding the fusion and some pain can result from this arthritis. Swelling is commonly persistent for 6 months following this surgery and maximal recovery may take up to 1 year. In some cases, following this operation, the stress on the ankle joint ligaments in increased and the ankle may tilt to the outside (valgus) making prior ankle arthritis more symptomatic. The literature has shown this can occur slightly more than 20 percent of the time despite a well done surgery. If this does occur and results in pain, an ankle replacement may be required to minimize the pain and improve the alignment of the ankle. If the fusion does not occur and the bones do not grow together, that can occur despite an appropriately done operation, there may be persistent swelling and pain that requires a revision of the surgery.