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Cavus Foot Reconstruction

A high arched foot can lead to multiple difficulties for the patient including instability, pain over the outside of the foot, peroneal tendon problems, ankle arthritis, and stress fractures. In some cases, a component of a neurologic component – termed neuropathy can be the primary or exacerbating cause for this condition. In some cases, the toes can be involved leading to what is termed claw toes. The condition can present subtly with only instability (loose ankle) that has a minor increase in the arch to a situation where the entire foot and ankle is tilted in and all the pressure is on the front and outside of the foot. There is no one operation for a cavus foot, every aspect of the deformity must be considered with regards to the severity and mobility of the joint. We consider the symptoms, physical exam and combine that with the xrays and in some cases a weightbearing CT to fully understand the complex deformity and formulate the plan we feel is most appropriate.

A combination of the procedures listed below are performed when surgically treating a cavus foot.

- Lateral Calcaneal (heel) sliding and closing wedge osteotomy (break)
 - The heel bone in these cases is angulated too far toward the center of the body. An incision is made on the outside of the heel bone and a wedge of bone is removed to re-orient the heel bone to a more neutral position, along with sliding the bone more towards the outside of the foot in order to improve the mechanics. The bone is fixed with 1 or 2 screws in most cases.
- 1st Metatarsal Dorsiflexion (up angulating) osteotomy (break)
 - The foot bone – called the 1st metatarsal is angled too far down, resulting in the high arch. In order to balance the forces on the foot, the bone may need to be broken with a small wedge of bone taken out to pull the bone more up (dorsiflex) so that the arch is more neutral. This bone is usually stabilized with a surgical staple or a plate and screws
- Tendon Transfers
 - A tendon called the peroneus longus is typically transected and transferred to the tendon called the peroneus brevis. Both of these tendons run along the outside of the foot, however, the peroneus longus pulls the inside of the foot down making the arch larger. Therefore in order to restore more balance to the forces acting on the foot, this tendon is transferred to the peroneus brevis so that there is more force pulling the foot laterally (outward) to improve stability and this also lessens the force causing the arch to be elevated.
 - If there is a component of weakness to the up motion, a transfer of the tendon called the posterior tibial tendon to the top of the foot may be required (See Tendon Transfer for Foot Drop)

- Plantar Fascia Release
 - The ligament on the bottom of the foot, called the plantar fascia is tight in most patients with this condition. To allow the arch to reduce and allow the heel to slide to the outside, a small incision is made near the bottom of the foot and ligament is lengthened.
- Ankle Stabilization/Ligament Reconstruction
 - In almost all cases, the ligaments on the outside of the foot are stretched and the ankle feels loose / unstable. The ligaments on the outside of the foot are taken off of the bone called the fibula, any spurs and bony prominences are removed. The ligament is then reconstructed with augmentation, in what is called the augmented Brostrom procedure that allows tightening of the ligament to improve stability. In cases where there is significant deformity or very little tissue, a portion of the tendon called the peroneus brevis is used to reconstruct the ligament, or allograft (tissue from someone who has passed away) is used to place new tissue to help improve stability.

Other additional procedures may be required as well including a midfoot osteotomy – where the entire middle of the foot requires taking a wedge of bone out and a significant deformity correction is done. This is not routinely required, however, is required when significant deformity is present. A fusion of the hindfoot – a triple fusion/arthrodesis is needed in cases where the joints in the back of the foot are very stiff or if there is arthritis. Additionally, if there ankle arthritis, a staged ankle replacement may be required 6 months after correcting the foot to provide maximum pain and relief and functional improvement.

Given the amount of surgery required to correct the foot and ankle for this deformity, associated deformity of the toes is deferred to a later surgery so that the wound complication rate is lowered. Additionally, the position of the toes will be altered and sometimes worsened after correction of the foot, and by staging the surgery, the most appropriate operation for the toes can be considered.

Correction of a cavus foot is very demanding for both the patient and the surgeon, sometimes requiring 2 or 3 surgeries to correct all the various deformities. When considering cavus surgery, the shape of the foot will be improved, but not normalized. The overall expected functional outcome is dependent on the severity of the deformity, flexibility of the foot, and neurologic state. The most reasonable expectation is that surgery will help improve the level of pain for the activities that you are currently able to do. If a patient is unable to run or wear fashionable shoes prior to surgery, this will not likely occur after surgery for this condition.