Cavovarus deformity is defined by fixed equinus of the forefoot on the hindfoot, resulting in a pathologic elevation of the longitudinal arch, with either a fixed or flexible varus hindfoot deformity. The cause is most commonly associated with underlying neurologic disorders being Charcot-Marie-Tooth disease the most commonly identified diagnosis.

As it has been stated in the literature, cavovarus deformity manifests in the growing child with a consequent change in shape and position of bones. The muscle involvement progresses from distal to proximal, affecting primarily the tibialis anterior and peroneus brevis, with secondary dysfunction of the intrinsic muscles.

In clinical examination all levels of imbalance must be assessed, including lateral ligament instability, hindfoot flexibility, muscle power, soft tissue contractures.

Surgical indication has been recommended early as possible in progressive deformities and in includes, osteotomies, arthrodesis, soft tissue releases and tendon transfers.

**General considerations for tendon transfers:**
1. The tendon to be transferred should have similar normal strength (at least grade 4).
2. The tendon should be inserted close to the tendon to be replaced and routed without angulation (the exact position depends on clinical evaluation of balance).
3. There should be flexibility of the joints involved with the tendon transfer.
4. Fixation of the tendon should be to the bone directly.
5. Agonists are preferable to antagonists.

These ideal criteria are not always fully present; however tendon transfers should be performed after fixed deformities are corrected to achieve the appropriate tension of the tendon transferred. Some controversy remains as to whether performing tendon transfers and osteotomies early avoids triple...
arthrodesis in the future. As a general rule, the authors prefer to indicate surgery as soon as patients begin with symptoms unresponsive to medical treatment.

**General strategy**

After the static corrections (osteotomies) and soft tissue releases have been performed, a perfect tendon balance is of paramount importance to avoid recurrency as it is shown in this drawing.

**Tendon transfers**

- **Peroneous longus to brevis tendon transfer:**
  This is the most common tendon transfer in cavovarus foot to move a strong first metatarsal flexor to improve eversion power. It can be performed proximally or distally with a lateral to lateral suture.

- **Posterior tendon transfer**
  The peroneus longus to brevis tendon will help stabilize the ankle but will not be enough to stabilize the hindfoot. Therefore, the second most common tendon transfer that the authors perform is tibialis posterior to one of the cuneiform bones. This transfer eliminates the principal deforming force of the hindfoot, which is the posterior tibialis, and reinforces the weak anterior tibialis. This transfer is particularly necessary in Charcot-Marie-Tooth disease. It must be remembered that even a weak posterior tibial tendon should be transferred. If the tendon length is inadequate, a turndown flap can be performed or a formal graft can be used. (the latter is rarely necessary).

The author’s preferred technique is to perform the transfer through the interosseous membrane,
harvesting the tendon as distal as possible from a medial incision over the navicular bone. It is then passed proximally to an incision placed medially over the leg, 15 cm above the ankle joint. A third incision is performed over the anterior tibia, 12 cm above the ankle joint line; the tendon is retrieved through the interosseous membrane, taking care in opening a wide window in the interosseous membrane with the help of long scissors or right-angle clamps. From this point, the tendon is passed subcutaneously to the dorsum of the foot where a fourth incision is placed over the cuneiforms. The exact position is chosen based on clinical examination of the balance of ankle and hindfoot.

Our preferred fixation technique is an interference screw after proper transosseous tension is obtained keeping the ankle in mild dorsiflexion.

**Bridle procedure**
The bridle procedure has been described by Rodriguez and is particularly useful when there is a severe peroneal muscular deficit. It consists of transferring the posterior tibial tendon and adding the peroneus longus and tibialis anterior. The posterior tibial tendon is passed through the tibialis anterior after passing through the interosseous membrane (similar to posterior tibialis to cuneiform transfer). Then the peroneus longus is harvested by a lateral incision over the peroneal tendons, cutting it as proximal as possible and retrieving it through a distal approach just proximal to the base of the fifth metatarsal. It is then transferred subcutaneously from lateral to anterior and retrieved through the anterior incision where the posterior tibialis was passed through the anterior tibialis. In this area, the peroneus longus is sutured in adequate tension to the anterior tibialis in order to obtain a properly well-balanced midfoot. Finally, the posterior tibial tendon is secured onto the lateral cuneiforme.

The exact point of insertion must be evaluated in each case. The options for this insertion go from the medial cuneiform to the cuboid in extreme deformities.

**Other tendon transfers in cavovarus foot**
If posterior tibial tendon is not strong enough another out of phase tendon can be use as FHL or FDL. In specific cases there is a strong anterior tibialis than can be transferred to the cuneiform instead of the posterior tibialis.

It must be considered that in most severe cases Achilles tendon lengthening is necessary as well a lateral ligament reconstruction in some case. We try to avoid arthrodesis but in the cases when this is necessary tendon transfer or at least tendon cuts must be consider to control deforming forces eventhough and arthrodesis is performed.

Tendon transfers to correct claw hallux and hammer toe must also be considered.

**Summary**
Although surgical treatment for cavovarus foot includes several procedures the importance of debilitating the deforming forces and increasing the power of the weak muscles is of paramount importance to obtain correction and avoid recurrentes