



POSNA

The Core Curriculum

Cavus foot

Objectives

1. Define cavus foot
2. Describe the mechanism(s) responsible for the development of cavus foot
3. Describe underlying conditions which can be heralded by a cavus foot deformity
4. Discuss treatment approaches to the cavus foot

Discussion point

1. Why is it so hard to delineate the pathology of the cavus foot?

Discussion

Cavus foot simply means a high arch. There are a number of anatomic variables accompanying a high arch, however, and there are a number of etiologies for those anatomic variables. Thus, the literature on cavus feet is difficult to distill; nonetheless a few valuable principles can be deduced.

It is generally agreed that some type of muscle imbalance is necessary to develop the constellation of anatomic deformities characteristic of the cavus foot. Intrinsic weakness is a common feature. The intrinsic flex the MP joints, and extend the IP joints, thus there is clawing of the toes with hyperextension of the MP joints. A plantarflexed first metatarsal is often regarded as the key deformity in a cavus foot. Loss of the peroneus longus has been associated with this deformity; Mann however regards over-activity of the peroneus longus associated with weakness of the peroneus brevis and anterior tibial to be the basic imbalance. Langenskiold considered a strong anterior tibial to be the underlying problem. The reader unfortunately must consider the arguments of the various authors, review the anatomy, and decide what is a good working hypothesis for him/her in assessment and management of the cavus foot. Certain conditions such as Charcot-Marie-Tooth disease, Friedreich's ataxia, poliomyelitis, and spinal dysraphism constitute the etiology of greater than half the cases of cavus foot. In a number of children, however, an exhaustive search for an underlying disorder will be unrewarding, and these are still classified as idiopathic. A dizzying number of surgical approaches have been described for the cavus foot. If there is any condition which demands individual assessment and decision making, it is the cavus foot. The simplest procedure available, plantar fasciotomy is rarely used as an isolated procedure; in cases of poliomyelitis with equinus of the forefoot, it was found to be effective. The Jones procedure, transfer of the extensor hallucis longus to the metatarsal neck with arthrodesis of the MP joint reduces clawing of the MP joints. Similar transfers may be performed on all toes. A number of osteotomies have been described to reduce the cavus of the midfoot. Some, such as the Fowler procedure attack only the first ray, while others, such as the Japas include the entire midfoot. A calcaneal osteotomy is helpful in the presence of fixed hindfoot deformity. A useful and simple

test by Coleman can be helpful in decision making, the fifth metatarsal is elevated with a block, allowing the plantarflexed first metatarsal to rise. If the hindfoot is in a varus position secondary to the tripod effect of a plantarflexed first metatarsal tilting the foot toward the straighter fifth metatarsal, the block under the fifth metatarsal will correct the heel varus, and hindfoot osteotomy is not necessary.

Generally, soft tissue transfers and plantar fasciotomy form the first echelon of procedures, midfoot osteotomies and occasionally hindfoot osteotomies the second, with arthrodesis reserved for salvage. The cavus will be progressive in many patients with progressive disorders, so preservation of joint motion is worthwhile - what may be balanced in the young may not be in the not so young. The cavus foot still has an element of mystery about it, with its elusive biomechanics and etiologies. Nonetheless, treatment based on thorough clinical evaluation and sound biomechanical principles will be effective; but longterm neurologic changes may still tarnish the result with time.

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