

Flexible Flatfoot

Some children will have a pronounced flatfoot deformity (Figure 1). Usually this deformity does not create symptoms, although some children may complain of an ache in their arch or calf muscles with increased activity. In most instances the flatfoot deformity is flexible and is due to a tight outer calf muscle. Treatment of flexible feet is almost always non-surgical and includes calf stretching, activity modification, and comfortable shoes often with a slight heel.

Figure 1A: Flexible Flatfoot – Front View



Figure 1B: Flexible Flatfoot – Side View



Figure 1C Flexible Flatfoot – Back View



Clinical Presentation

Many children have flat feet. However, some children develop marked flatfoot (often as adolescents) that are characterized by a striking flattening of the arch and a splaying outwards of the feet. Most of these individuals have no symptoms or may have some general aching in their arches if they are particularly active. However, the extent of their deformity often causes their parents to be quite alarmed and seek a consultation with an orthopaedic surgeon. The physician will then try to determine whether the patient's flatfeet are flexible (good hindfoot motion) or rigid (limited hindfoot motion). Flexible flatfeet are much more common than rigid flatfeet. Flexible flatfeet are usually caused by a tight calf muscle. Rigid flatfeet are usually caused by a tarsal coalition (failure of two or more bones of the hindfoot to separate).

Having flat feet is common with about 20 percent of the population having noticeably flat feet. Flatfoot deformities often runs in families. Most individuals with flat feet are asymptomatic although they are predisposed to develop certain conditions such as acquired adult flatfoot deformity, plantar fasciitis, and tarsal tunnel syndrome.

Physical Examination

Children with flatfeet will have noticeable flattening of the arch on the inside of the foot. Often the foot will also be splayed outwardly (abducted). Walking will often be fairly normal, although if there is pain a limp may be noted. Sensation to the foot will typically be normal. The motion of the hindfoot – specifically whether the foot can be moved inward (inversion) or outward (eversion) will determine whether the flatfoot deformity is flexible or rigid. Patients with a flexible flatfoot deformity will be noted to have a very tight outer calf muscle (gastrocnemius). As the foot is brought up with the knee straight the foot will often be 20-30 degrees short of neutral (right angle to the lower leg) when the calf tightness prevents further ankle motion. In order to get the foot flat on the ground this extra motion needs to come through the joint in front of the ankle (transverse tarsal joint made up of the calcaneocuboid and talonavicular joint). This does allow for extra upward motion of the foot, but the direction of this joint is such that the foot also splays out to the side creating the flatfoot deformity. If the foot is examined with

the knee bent the ankle motion is usually much better as bending the knee joint takes the pressure off the outer calf muscle (the gastrocnemius). Having a flexible flatfoot deformity tends to concentrate increased load through the inside of the ankle and the Achilles tendon, so it is not uncommon for children to have some symptoms in these areas especially if they have periods of increased activity

Imaging

Plain weight bearing x-rays of the foot will demonstrate a flattened arch. In patients with a tarsal coalition the coalition can often be seen on plain x-rays. However, it may be necessary to order a CT scan to fully assess whether a tarsal coalition is present. In some patients with vague symptoms an MRI may help identify areas of bone edema (increased blood flow) or other potential sources of pain.

Treatment

Flexible flatfeet are almost always treated non-operatively. Treatment may include:

Activity modification: Sometimes a short (1-2 week) period of limited activities can be enough to allow symptoms to settle. Less repetitive loading through tendons and joints will have the effect of decreasing irritation to these areas. In addition a switch to activities that require less loading (ex. from running to cycling) may also help symptoms to settle.

Calf stretching: Calf stretching is an important component of treating flexible flatfeet. It can be very helpful to try and stretch out the tight outer calf muscle by turning the foot inward and stretching the calf with the knee straight. This should be performed on a daily basis for the best long-term effect

Comfort shoes with a slight heel: Wearing shoes with a slight heel can be helpful. Comfort shoes can help to disperse the force up the leg more smoothly while a slight heel can have the effect of decreasing the amount of flattening of the arch that is required to get the foot flat on the ground.

Comment: I would think that long-term use of a heel lift can lead to a tight Achilles tendon. I would instead use it for a short time, send the kid to physical therapy to work on stretching the Gastroc.

Shoe inserts: It seems intuitive that individuals with a flatfoot would benefit from an orthotic that helps “prop up” their arch. In fact a stiff orthotic designed to elevate the arch may be uncomfortable as a marked amount of force would be required to fundamentally elevate and support the arch of the foot. However, a soft (accommodative) orthotic that can support the arch can be helpful. These orthotic inserts can often be obtained at sports stores or outdoor stores.

Comments: over the counter orthotic inserts can also be obtained at your orthopaedic surgeon’s office. These orthotics should be checked by your physician to ensure that they are fitting properly.

Operative Treatment

Flexible flatfeet rarely require surgical intervention. There have been reports of performing a gastrocnemius recession in adolescents that have truly failed non-operative treatment.

Comments: I don’t think simply performing a gastroc recession is a good treatment for adolescent flatfeet. This last section needs to be expanded a bit.