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Pes Planus (flat feet) in relation to knee pain

By: Timothy Conley, Joseph Davenport, *Instructor: Travis Parent, MS, ATC, CSCS*

Abstract

Pes Planus (Flat Foot) disorder has been found to be associated with frequent knee pain and medial tibiofemoral (TF) cartilage damage. The flattening of the foot causes this pain and damage within the knee by forcing the tibia to rotate internally increasing the rotational pressure on the TF joint. We will be discussing a few factors that may contribute to pes planus such as equinus foot deformity, tibial torsion, tarsal coalition, ligamentous laxity and congenital vertical talus. Amongst some of these contributions, a reduction in physical activity at a young age can also be a root cause to flat feet and genu valgum (knock-knees). We also observed the types of rehabilitation techniques for improving pes planus. In order to control muscle skeletal discomfort, pain, and correct biomechanical processes, rehabilitation focuses on the muscles responsible for plantar flexion, dorsiflexion, pronation, and supination of the ankle. Controlling the lateral longitudinal arch stability of the ankle has also proven to be a reliable method of improving a flat foot. With the use of personalized orthotics and short foot exercises, improvements have been shown to be reached. These exercises are designed to strengthen and support the cross-sectional area of the foot containing the flexor hallucis and abductor hallucis muscles. Because pes planus is a problem in younger patients, it's crucial to recognize the condition early and improve postural mechanics so arthritis and other joint damages can be prevented as the patient ages.

Introduction or Background

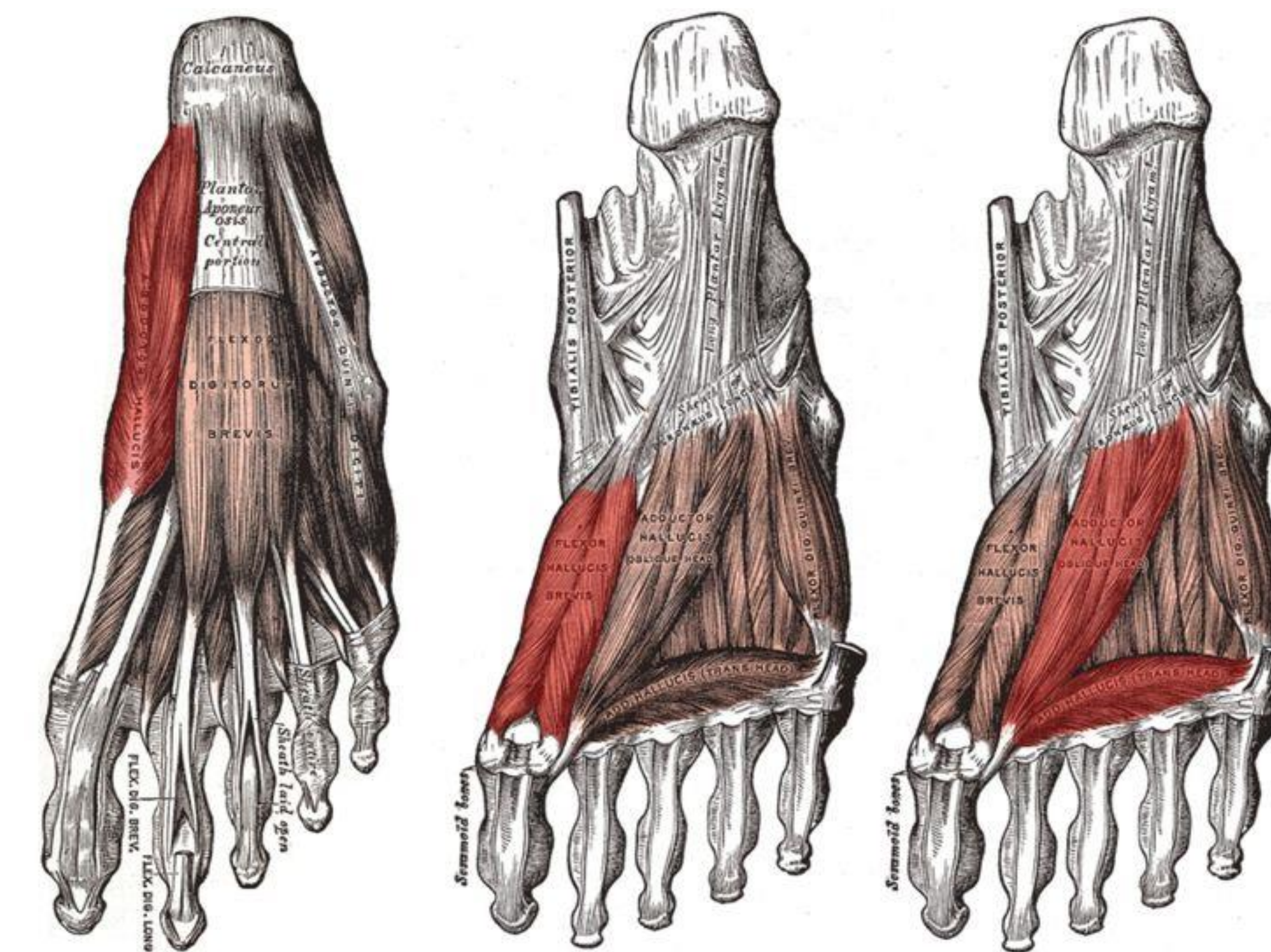
Majority of issues resulting in the human body can be traced back to the mechanics of our movements. These issues in movement can be traced back to the platform of which all movement is conducted on, this being our feet. When an individual's platform is cantered or uniquely altered, it ultimately effects the body in a chain like manner. Beginning from the floor and working its way up.

Clinical Question

- The causes of pes planus
- The effects pes planus has on the mechanics of movement
- Rehabilitation techniques for improving pes planus

Methods

- Personalized orthotics
- Rehabilitation on the muscles responsible for plantar flexion, dorsiflexion, pronation, and supination of the ankle.
- Controlling lateral longitudinal arch stability
- Short foot exercises designed to strengthen and support the cross-sectional area of the foot containing the flexor hallucis and abductor hallucis muscles.



Results

As seen in figure one, when an individual has pes planus it offsets the alignment of the ankle causing an excessive amount of supination or pronation of the foot. This misalignment then has a chain like effect that causes a misalignment of the knee which is then followed by misalignment of the hip, as seen in figure two. By applying orthotics or therapeutic exercises to help support the arch, the individual obtains a more solid platform realigning or maintain alignment and support of the ankle. Figure three shows the type and location of the muscles that are most involved with arch support of the foot.

Conclusions

Based on our findings we can conclude that there are many factors causing pes planus in an individual, everything from fetal birth to lack of activity. One thing that can be concluded though is that pes planus can be a significant factor in chronic knee pain or hip/back pain. This issue although bothersome, is not untreatable and can be fixed. By adding arch support you end up re-aligning the ankle which in turn re-aligns the knee and the hip, ultimately improving an individual's posture while adding stability. This in turn relieves stress on the joints and relieves the inflammation and pain that may be accompanied with it.

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