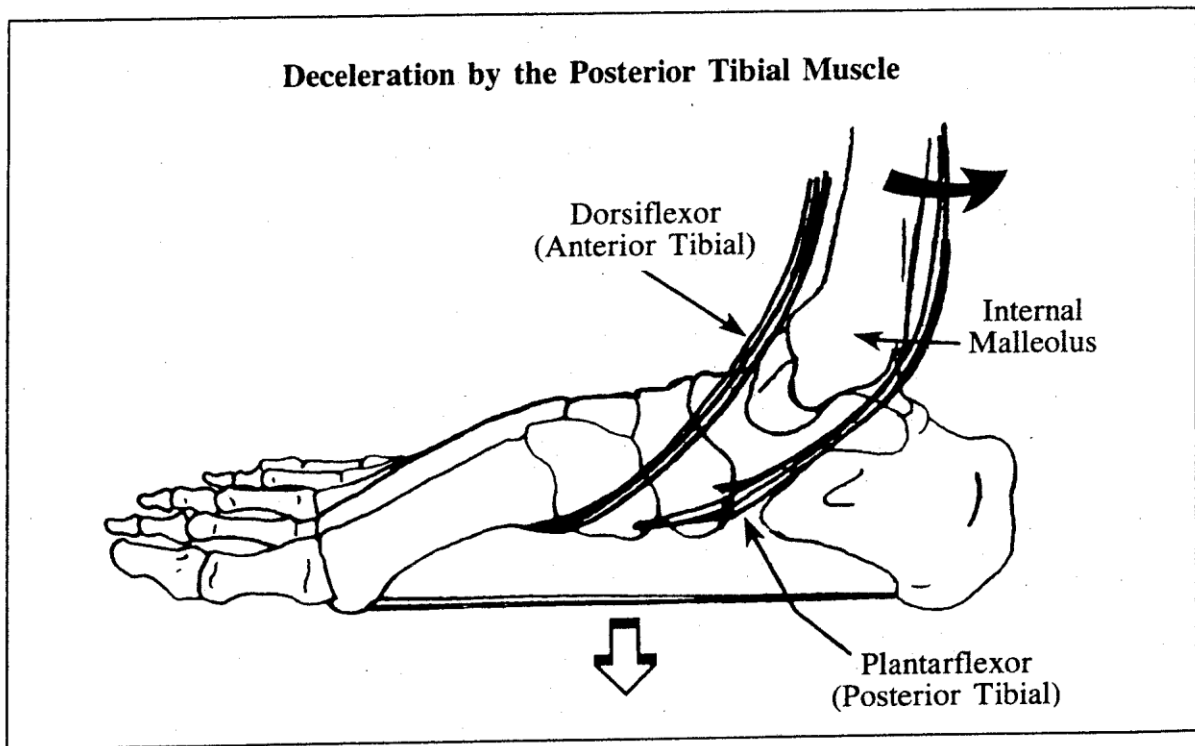


THE PRIMARY SHOCK ABSORBER OF THE BODY: *FOOT PRONATION*

(2,p.150-153; 6,p.576; 13,p.620-621)

During normal motion, shock is almost completely absorbed within the foot and lower extremity. Primarily shock is absorbed by controlled rapid pronation of the foot. The muscle that controls pronation is the posterior tibial. During a normal step, shock is attenuated by this muscle slowing the lowering of the longitudinal tarsal arch. This muscle does not function by shortening (concentric contraction) but by slowing down elongation (eccentric contraction). The medial longitudinal arch of the foot is therefore lowered gently to the ground instead of slapping the ground. The nerve root that supplies the posterior tibial muscle is L-5.



Could a subluxation of L-5 or an L-4 disc protrusion affect pronation, the primary shock absorber of the body? Yes.

Could a subluxation of the foot affect pronation, the primary shock absorber of the body? Yes.

THE SECONDARY SHOCK ABSORBER OF THE BODY: *KNEE FLEXION* (2,p.151-153)

At heel strike, the knee is extended, but must flex rapidly to absorb the shock associated with impact. The muscle that flexes the knee its first 15 degrees off of full extension is the popliteus. This is an internal rotator of the tibia which is supplied by the L-5 nerve root.

If the foot is already in pronation at heel strike, which means the tibia is already in internal rotation, can the popliteus muscle effectively flex the knee? No. Why?

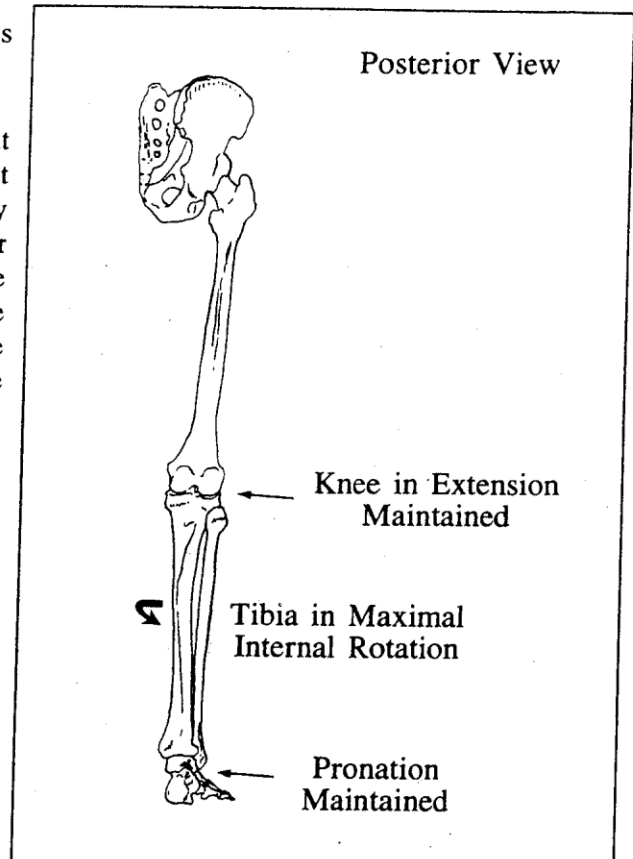
The popliteus is an internal rotator and the tibia is already in maximum internal rotation.

Normally the posterior tibial muscle contracts at heel strike. Its function is to decelerate subtalar joint pronation. If the subtalar joint is already fully pronated or immobilized at heel strike, the posterior tibial muscle will exert all of its contraction force proximally instead of distally, and will decelerate the tibia while the trunk and femur start to move over the implanted foot. Knee extension is maintained, and the knee does not flex to absorb shock.

Therefore, adequate shock absorption cannot occur at heel strike, unless subtalar joint pronation can occur to allow knee flexion!

Could a subluxation of L-5 or an L-4 disc protrusion affect knee flexion, the secondary shock absorber of the body? Yes.

Could inadequate pronation and knee flexion transmit extra shock and create abnormal motion in the pelvis and lumbar spine? Yes.



Here is what an expert in podiatry says:

QUOTABLE QUOTES (2,p.153)

1. "Any condition which prevents normal pronation of the subtalar joint, results in pathologic shock. That shock is transmitted up the leg, into the pelvis, and on to the lumbar spine".
2. "This can lead to degenerative joint disease, muscle spasm, and chronic low back pain".
3. (Following an adjustment) "A functional orthosis which can re-establish some pronation at heel strike will usually relieve back pain associated with faulty shock absorption".