Osteopathic Evaluation of the Runner

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Osteopathic Evaluation of the Runner

- With the onset of physical fitness as a sport in its own right, there has been a continuous explosion of recreational runners since the 1970’s.
- There has also been a new approach to running (minimalist) which calls into question some of the accepted concepts about stride and strike.
- These two facts in addition to the use of running as a training mechanism for other sports has significantly increased the amount of running injuries seen.
Osteopathic Evaluation of the Runner

- In the young runner with open growth plates the best preventative osteopathic treatment that can be done is to decrease tone in areas of extreme muscle tension.
- By decreasing the tugging and pulling of muscle insertions near growth plates the propensity for a decrease in apophyseal injury exists.
- This approach is helpful after injury as a treatment as well, however the screening for muscle tension should be considered in all athletes, including runners.
Osteopathic Evaluation of the Runner

- A quick reminder about the kinetic chain:
- It is a fertile ground for the propagation of somatic dysfunction. While we all understand that the kinetic chain can predict the course of injury and why, it is also useful to look at the kinetic chain’s potential for the propagation of SOMATIC DYSFUNCTION.
- In this model hypertonic structures allow forces to pass through them until they accumulate in an area that has laxity and absorbs the force.
- Ex. Plantar fascia, achilles, gastroc–soleus, hamstrings, sacrotuberous ligament, SIJ, iliolumbar ligament, L–spine, diaphragm, pectoralis, rotator cuff, -- -- -- biceps, interosseous membrane, hand...
Osteopathic Evaluation of the Runner

Foot and ankle mechanics

Pelvic mechanics
Osteopathic Evaluation of the Runner: overpronation

- The pronated ankle is the most common lower extremity biomechanical abnormality that affects running.
- It’s effects are worsened by severity or pronation during gait phases that should be supinated (heel strike).
Osteopathic Evaluation of the Runner: over pronation

- The advent of “bare foot” running and minimalist foot wear, will decrease the effects of over-pronation if done properly.
- When running with out heel or arch support the runner is forced to move to a mid-foot strike pattern, decreasing the negative effects of heel striking.
- Proper transitioning into this type of footwear and stride is needed to avoid other stress and impact injuries.
Osteopathic Evaluation of the Runner: over pronation

**Effects on the foot**

- Excessive pronation increases ground reaction forces on the medial aspect of the foot, increased load on the medial longitudinal arch (plantar fascia and plantar musculature), eccentric load on the gastrocnemius–soleus complex and posterior tibialis.

Overpronation is often accompanied by pes planus.
Osteopathic Evaluation of the Runner: over pronation

Effects on the body

- Excessive pronation leads to...
- Internal rotation of the tibia (increased tone in the IT band)
- Valgus strain on the knee (lateral motion of the patella, lateral joint space stress)

What comes down must go up?
Osteopathic Evaluation of the Runner: over pronation

- Because of the change in foot mechanics over pronation of the ankle can be a contributing factor in the following injuries...
  - Sesamoiditis
  - Plantar fasciitis
  - Achilles tendinopathy
  - Medial shin pain
  - Patellar tendinopathy
  - Metatarsal stress fx
  - Navicular stress fx
  - Fibular stress fx
Osteopathic Evaluation of the Runner: pes planus secondary to over pronation

- Foot mechanics should address the pes planus habitus of the foot
Gently springing the bones of the forefoot will illicit pain and be met with restriction of motion.

HVLA of the NAVICULAR, cuboid or cuneiforms aka the hiss whip
Osteopathic Evaluation of the Runner: over pronation

- Evaluation of the subtalar joint will demonstrate an ease of motion into pronation with accompanying supination restriction.
- Other diagnostic clues include valgus habitus of the achilles and the “too many toe sign”
Osteopathic Evaluation of the Runner: over pronation

- Effective treatments for the subtalar joint include balanced ligamentous tension, ligamentous articular strain and fulcrum generation (the boot jack)
- Appropriate adjunctive treatment includes formal evaluation for medial posting orthotics
- All OMT should be performed before orthotic evaluation so that joint stabilizers will function more appropriately.
Osteopathic Evaluation of the Runner: foot and ankle lab
Osteopathic Evaluation of the Runner: pelvic mechanics

- Running, in contrast to walking, is a “one leg/foot” activity. It is a controlled alternating jump from one lower extremity to the other.
- The amount of time the athlete spends on one leg requires the gluteal muscles (in particular gluteus medius) to work to stabilize the pelvis.
Osteopathic Evaluation of the Runner: pelvic mechanics

- The action of prolonged running preferentially develops the quadriceps and hamstrings musculature, while the gluts develop a relative weakness. This manifests as earlier fatigue
After the gluteal muscles fatigue additional lateral stabilizers, in particular the IT band and Tensor Fascia lata (TFL) develop an increase in tone to compensate.

This leads to an entire spectrum of injuries and pain in the lower extremity.
Osteopathic Evaluation of the Runner: pelvic mechanics

Injuries from over use of lateral stabilizers

- IT band friction syndrome
- Distal IT band bursitis
- Greater trochanteric bursitis
- Contributing factor in patello-femoral pain syndrome

Ober’s test for IT band tension. Remember to compare to the unaffected side.
Osteopathic Evaluation of the Runner: pelvic mechanics

Diagnostic clues

- Somatic dysfunction in this region is most often characterized by tenderness to palpation and tissue texture change in the IT band itself in addition to trigger points within the TFL.
Osteopathic Evaluation of the Runner: pelvic mechanics

- Appropriate management includes balanced ligamentous tension, in a direct or indirect fashion, direct soft tissue of the IT band and myofascial release/muscle energy of TFL
Remember that because of the use of running as a training medium for other sports, you will encounter these injuries and somatic dysfunction patterns in patients who aren’t traditional runners. Your novice runners may in fact be more likely to injure themselves.
Osteopathic Evaluation of the Runner: References

- Foundations of osteopathic medicine, A. Chila, Lippincott, 2011
- Principles of manual medicine, P. Greenman, Williams and Wilkins, 1996