Navicular Stress fractures in Runners

Stress fractures are
an overuse condition that develop after periods of repeated mechanical loading
which leads to structural fatigue and microdamage of the bone. This microdamage outweighs the bodies ability to repair the involved bone. This can
result in localised pain, tenderness and reduced performance in sport. Navicular stress fractures are a common stress fracture found in the middle of the foot. They are rare in the general population but
represent 14-33% of all stress fractures and commonly occur in young males,
especially in track and field athletes. Navicular stress fractures are considered a high-risk stress fracture, partially due to their poor blood supply, and as such cause
significant disruption to training and competition.

Risk factors

There are many modifiable and
non-modifiable risk factors to the development of navicular stress fractures in athletes. These may include:

- High vertical loading rates e.g. heavy landing through running gait
- Inadequate footwear or equipment e.g. poorly fitting shoes or age >6 months,
- Dramatic changes in training principles

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(intensity, duration, frequency) e.g. load spikes in mileage or intensity
- Insufficient recovery periods
- Running gait/technique
- Alteration of training surfaces e.g. increase in ratio of road running
- Foot shape/morphology e.g. reduced ankle mobility
- Inadequate nutrition e.g. low calcium or vitamin D intake
- Poor prior strength and fitness

Diagnosis

Diagnosis of navicular stress fractures are often difficult as there is often a delay between pain onset and diagnosis. Athletes and practitioners may often overlook the potential seriousness of the injury. Bone scans can be effective at localising the stress fracture, with CT scans more suited to diagnosing severity and progression of the fracture.

If imaging hasn't been performed, diagnosis is initially made clinically. The clinician may find swelling, tenderness on palpation on the top of the midfoot, and focal pain in certain activities (e.g. calf raises or single leg hops). There is strong correlation for a period of repetitive loading with limited rest or a sudden load spike in training.

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Management

Management of navicular stress fractures depends on the fracture site, severity of the stress reaction and the demands normally placed on the area by the athlete. Management is often aggressive in order to give the area the best chance to heal. The preferred treatment for navicular stress fractures is a period of non-weight bearing in a cast for 6-8 weeks with weight-bearing in a boot for 2-6 weeks or until pain-free. Anything less conservative such as partial weight-bearing has been shown to have poorer results. When managed correctly there is a great healing rate at the 5-week mark and a return to sport at an average of 5 months. Surgical repair is also a common management path if conservative management fails.

Further strategies such as managing training volume, cross-training and strengthening, and gait retraining are also critical in helping the athlete return to sport.

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