Ultrasound-guided injections in the treatment of stress fractures of the hallucal sesamoids

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Sesamoid stress fractures

Medial (tibial) sesamoid

Lateral (fibular) sesamoid

3D CT (left foot, frontal view)
Sesamoid stress fractures

Treatment options

• Rest (how long?)
• Modification of activities
• ?? plaster - taping
• Non-steroidal anti inflammatory drugs

“A prolonged period of non weight bearing does not have predictable results and has to weighed against the adverse effects of immobilization.”

W. Hamilton

• Surgery (mixed results)
Natural history of sesamoid fractures?

“On many occasions in older dancers, the sesamoids appeared as if they had been smashed with a hammer. During questioning, the dancers invariably stated that they had experienced pain in the area for a year or more, but it eventually went away. Most of the time, they had been unaware of the nature of the problem and just continued dancing with the pain.

The sesamoids eventually healed by asymptomatic fibrous union.”

W. Hamilton

Foot & Ankle Injuries in Dancers

John Lowe
91 years old
(in 2011)
Rationale of treatment with an injection

To covert a symptomatic fracture to an asymptomatic (+/- fibrous) union with:

- low risk
- quick return to activities
- low cost
- not precluding later surgery, if necessary
Technique

- Single injection, 2 ml betamethasone
- Entry point: depending on the fracture location and comminution
- Local anaesthesia
- 23-25G needle
- Localization of the fracture / needle with ultrasound
Why ultrasound guidance?

- Accurate localization of injection at the fracture level
- Inexpensive
- Repeatable
- No radiation
- Dynamic
- Evaluation of coexisting pathology

Sesamoid injection

Sesamoid stress fractures
Patient series

11 patients (5♀, 6♂)
5 right - 6 left feet
8 tibial, 3 fibular sesamoids

>3 months of symptoms before diagnosis
Average: 10 months

Post – injection: 2 days rest, return to activities as pain allowed

In 2 patients: repeat injection after 2-3 months

Sesamoid stress fractures

Panos Symeonidis
Evaluation

✓ Visual Analog Scale for pain

✓ Foot Function Index

✓ AOFAS Hallux Metatarsophalangeal – Interphalangeal Scale

Follow up: min. 6 months, average 9.8 months

Independent observer scoring the patients
Results

<table>
<thead>
<tr>
<th>VAS (pain)</th>
<th>Foot Function Index</th>
<th>AOFAS score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>After</td>
<td>Before</td>
</tr>
<tr>
<td>6.5</td>
<td>2.7</td>
<td>54.9</td>
</tr>
<tr>
<td>p= 0.00015</td>
<td>p= 0.00016</td>
<td>p= 0.00081</td>
</tr>
</tbody>
</table>

- No adverse effects
- All but one patient had pain improvement
- Four patients still use insole orthotics
- One patient failed injection treatment and required surgery
- Comminuted fibular fracture – 2 injections

**Alternatives**

The future?

- Platelet Rich Plasma
- Stem cells from fatty tissue
- Osteomorphogenic Proteins
- Bone marrow concentrate

Sesamoid stress fractures
References


Sesamoid stress fractures

Panos Symeonidis