Sesamoid Disorders and Injuries in Dancers

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Sesamoid complex Anatomy

Function
- Absorbs WB Forces
- Increase moment arm of FHB – PF power
- Stability of 1st MTPJ complex

Background

Anatomy

- Ossify - girls - 8
  - boys - 12
- Bipartite - 10%
  - More common Medial
  - 25% bilateral
  - Rarely lateral
- Medial larger and more prone to injury

History

Acute
- Turf toe
- Sesamoid fracture
- Traumatic Hallux valgus

Chronic
- “Sesamoiditis”
- Osteochondrosis
- MTPJ DJD
- Bipartite sesamoid
Radiology

• Standard WB foot views

• Axial view

Sesamoid Fracture versus Bipartite

• 25% of bipartite sesamoids are bilat and 85% are symmetric
• Bilat fractures are rare
• Irregular pattern
• Sharp edges
• Widely displaced

Further Studies

• 3 Phase Bone Scan
  – Fracture vs soft tissue problems
• MRI
  – Sagittal cuts
  – Fracture: Low intensity on T1
  – Stress #: marrow edema. Only slightly decreased T1

Fractures

• Crush injury/Severe trauma – seldom

• Stress fracture
  – “explosive” sports

Treatment

• Non-operative
  – Rest
  – Splint in PF
  – Unloading orthotic
  – Restrict DF

If that fails…

Fracture

ORIF
  – Better in acute cases
Fracture treatment

Late bone graft


- Bone graft from MT head
- 19 of 21 returned to full activity

Bone graft

- Stress fracture nonunions
  - Minimal diastasis
- Chronic painful nonunions

Maybe not such a good idea


Fracture

- The majority of Sesamoid issues in Dancers are:
  - "Sesamoiditis"
  - Osteochondrosis

The Beauty...

Osteochondrosis
Sesamoidectomy

Partial
- Don’t like it much
  - Not good pain relief
- Only when one fragment is small

Partial excision

- Proximal (or smaller) pole excision
  - 6 athletes
    - All returned to normal activities in 6 months

Sesamoidectomy

Total
- ? transfer Abd Hall into defect
  - Prevents cock-up
- Lateral sesamoid
  - Plantar approach

Sesamoidectomy

Mann RA et al: Sesamoidectomy of the great toe. Orthopaedic Transactions 1985
- Significant morbidity
  - 50% had ongoing pain
  - 60% PF weakness
  - 33% had reduced ROM

Sesamoidectomy

Lee S et al. Evaluation of hallux alignment and functional outcome after isolated tibial sesamoidectomy. FAI 2005
- 90% returned to normal activity
- No change in IMA, HVA etc
- No change in Plantar Pressure
- 30-40 % has some ongoing discomfort

Sesamoidectomy

- Brodsky J. Sesamoid excision for chronic non-union.
- Only 2 of 23 had post-op weakness in PF
- Overall excellent result as far as pain relief and function
Medial sesamoidectomy
Bichara et al: Sesamoidectomy for hallux sesamoid fractures. FAI. 2012 Sep
• 24 patients – 5 “elite athletes”
• 22 return to previous level of activity
• VAS pain down to 0.7 from 6.2 pre-op
• 1 iatrogenic hallux valgus

Myerson 2013
• 15 professional athletes
• Medial or lateral sesamoid resection
• 13 returned to career

Osteochondrosis

Medial excision
Seldom leads to issues with remaining sesamoid

Repair plantar structures
Two weeks

3 months

Special Considerations

- Beware of the dancer’s psyche: “rest” and “quit” are often perceived as the same word. Late injury reporting is common, and pain is not viewed by most dancers as a reason to modify activity.

Rehab

- Courtesy of Meredith Butulis.

Rehabilitation Guidelines

Rehabilitation Goals & Time Frames
Pointe Functional Tests

- **Topple Test.** Pass = 1 success; # of trials undefined.
  - [Visit Video](http://youtu.be/FoVF9CUV2h0)
  - Single pirouette turned out with clean landing to 4th
- **Airplane Test.** Pass = 4 successful/5 attempts
  - [Visit Video](http://youtu.be/DAcJ2nihD0M)
  - Pelvis stable & neutral in all 3 planes
  - No hopping, no touching hand or foot down
- **Sauté Test.** Pass = 8 successful/16 sautes
  - [Visit Video](http://youtu.be/stUFfrdXj1M)
  - Performed in parallel with arms crossed
  - Fully pointed foot (plantarflexed)
  - Land on the X
  - Good pelvofemoral control

Our results

Brad Moser, MD  Minnesota Dance Medicine

- 84 Sesamoid surgeries past 4 year

Results

- Due to the unique circumstances of dance full return is not a given
- About 70% return to previous level
- Sport on softer surfaces and protective shoes = 85%

Thank you