

Rehabilitation of a NCAA Division I Runner Following a Sesamoidectomy

Secondary to Avascular Necrosis: A Case Report

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REHABILITATION SERVICES

Introduction

- Hallux injuries are common in active runners, especially due to repetitive stress during high-impact activities.
- The metatarsophalangeal (MTP) joint experience's joint reaction forces up to 200–300% of body weight during push-off, and up to 800% during jumping, increasing injury risk.
- Sesamoid Avascular Necrosis (AVN) typically affects women aged 18–29 years and is linked to repetitive trauma.
- Contributing factors to AVN include:
 - Increased activity: high-impact sports.
 - Poor footwear: high heels.
 - Anatomical variations: pes cavus, hindfoot varus, equinus.
- The tibial (medial) sesamoid is most commonly affected in AVN cases.

Purpose

The purpose of this case report is to explore the clinical decision-making process and management strategies for an athlete aiming to return to their pre-injury sport-specific demands following a sesamoidectomy.

Case Description

- 17-year-old, 5'3", 115 lb female NCAA Division I Track and Cross-Country runner participating in the 800m, 1600m, and 5k events. No significant past medical history
- Failed 5 months of conservative treatment of activity modification, footwear changes, and orthotic modifications.
- 2 months status post fibularis (lateral) sesamoidectomy with NWB restriction.
- Main complaints of soreness during terminal stance and rock like feeling under surgical incision.
- A gait pattern characterized by limited stride length, with increased weight-bearing through the rearfoot during midstance and terminal stance phases
- WBAT with Controlled Ankle Motion (CAM) Boot

Outcomes

Single Leg Calf Raise Endurance	Initial Evaluation		Discharge	
	Right	Left	Right	Left
	28	0	>35	>35 (compensation at knee with 20)
Calf Girth Measurement	Initial Evaluation		Discharge	
	Right	Left	Right	Left
	34cm	31cm	35cm	34cm
First MTP AROM	Initial Evaluation		Discharge	
	Right	Left	Right	Left
Flexion	50°	20°	50°	50°
Extension	80°	50°	80°	80°
First MTP MMT	Initial Evaluation		Discharge	
	Right	Left	Right	Left
Flexor Hallucis Longus	5/5	3+/5	11.5lbs	10.8lbs
Extensor Hallucis Longus	5/5	4-/5	5/5	5/5
Soleus	NA		48lbs	43.1lbs
Foot and Ankle Ability Measure (FAAM)	Initial Evaluation (5/20/2024)		Discharge (8/1/2024)	
FAAM - ADL	56/84 = 67%		81/84 = 96%	
FAAM - Sport	5/32 = 16%		18/32 = 56%	

Discussion

- Limited evidence exists on long-term outcomes and post-surgical rehabilitation following sesamoidectomy in younger athletes.
- This case study highlights the positive response of an individual who underwent fibularis sesamoidectomy to:
 - A combination of exercise and manual therapy techniques
 - Restoration of running ability
- Key emphasis on addressing:
 - Strength deficits
 - Mobility deficits
 - Post-surgical rehabilitation to facilitate return to running
- Despite ongoing Triceps Surae complex strength deficits due to extended weight-bearing restrictions, the approach aimed to:
 - Optimize recovery
 - Support a successful return to running and sports-related activities
- Further Research is needed to:
 - Explore long-term effectiveness of recovery strategies
 - Assess sustainability in younger athletes

References

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