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REHABILITATION FOLLOWING A HAMSTRING INJURY

Agenda
- Anatomy
- Rate of Injury
- Injury Presentation
- Injury Considerations
- Risk Factors
- Rehabilitation
- Prevention

Anatomy

UEFA over 7 seasons (Ekstrand, 2009)
- 525 hamstring strains = 11.7%
- Avg of 7 hamstring strains per season on a 25 player squad

Hong Kong Football Association, 1 season (Wai-Yuk Lee, 2014)
- 12% incidence rate
- Out of all recurrent injuries, 26% were hamstring strains
- 28% of hamstring strains were moderate or severe (>7 days time loss) = avg 9.4d time loss

MLS inaugural season, 1996 (Morgan, 2001)
- 9% of total injuries were hamstring strains
- 42% of all muscle strains

Rate of Injury

Injury Presentation

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Injury Presentation

- High speed running
- Rapid acceleration / deceleration
- Susceptible during powerful eccentric contraction
- Late in the swing phase – most common stage of injury occurrence
- Running injuries involve biceps femoris most often
- Semimembranosus injured in kicking or dancing

Anatomy

Origin: Pelvis, Femur
Semitendinosus
Biceps femoris
Semitendinosus
Tibial tuberosity
Semitendinosus

Insertion: Tibia, Fibula
Actions: Knee flexion, Hip extension

Anatomy

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Biceps femoris
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Tibial tuberosity
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Injury Considerations

- 1/3 of hamstring injuries will recur (Orchard, 2002)
  - Highest risk within the first 2 wks of return to sport
- Some factors require a longer rehab period (Heiderscheit, 2010)
  - Proximal free tendon injury
  - Close to the ischial tuberosity
  - Increased size of injured area
- Intramuscular tendon injuries present as more severe but typically have a quicker return to play (Heiderscheit, 2010)

Possible Risk Factors

- Weakness and imbalance
- Body mechanics
- Fatigue
- Lack of flexibility
- Inadequate warm-up
- Sport specific activities
- Psychosocial factors
- Running technique
- Hydration??

Rehabilitation

Phase 1

- Goals
  - Protect scar development
  - Minimize atrophy
- Protection
  - Avoid excessive active or passive lengthening of hamstrings
- Criteria for progression
  - Normal walk with no pain
  - Very low speed jog with no pain
  - Pain free isometric contraction against submax resistance at 90

Rehabilitation

Phase 1

- Stationary bike x 10min
- Side step x 10m, 3 x 1min
- Grapevine x 10m, 3 x 1min
- Fast feet stepping, 2 x 1min

Rehabilitation

Phase 1

- Prone body bridge, 5 x 10s
- Side body bridge, 5 x 10s
- Supine bent knee bridge, 10 x 5s
- Single limb balance progression, 4 x 20s

Rehabilitation

Phase 2

- Goals
  - Regain pain-free HS strength
  - Develop neuromuscular control of trunk and pelvis
- Protection
  - Avoid end range lengthening of hamstrings while weakness is present
- Criteria for progression
  - Full strength without pain during manual strength test at 90
  - Pain-free forward and backward jog, moderate intensity
Rehabilitation
Phase 2

- Stationary bike x 10min
- Side shuffle x 10m, 3 x 1min
  - Moderate to high intensity
- Grapevine jog x 10m, 3 x 1min
  - Moderate to high intensity
- Boxer shuffle x 10m, 2 x 1min
  - Low to moderate intensity
- Rotating body bridge, 5s hold, 2 x 10

Rehabilitation
Phase 2

- Supine bent knee bridge with walkouts, 3 x 10
- SL balance windmill touches, 4 x 8 reps per arm
- Lunge walk with trunk rotation and T-lift, 2 x 10 steps each
- SL balance with forward trunk lean and opposite hip extension, 5 x 10

Rehabilitation
Phase 3

- Rotating body bridge with dumbbells, 5s hold, 2 x 10
- SL chair
- Single limb balance windmill touches with dumbbells, 4 x 8 reps per arm
- Lunge walk with trunk rotation and T-lift with dumbbells, 2 x 10 steps each
- Sport specific drills

Rehabilitation
Phase 3

- Supine bent knee bridge with walkouts, 3 x 10
- SL balance windmill touches, 4 x 8 reps per arm
- Lunge walk with trunk rotation and T-lift, 2 x 10 steps each
- SL balance with forward trunk lean and opposite hip extension, 5 x 10

Rehabilitation
Phase 3

Goals
- No pain or tightness during all activities
- Normal concentric and eccentric HS strength throughout full ROM and speeds
- Improve neuromuscular control of trunk and pelvis
- Integrate postural control into sport-specific movements

Protection
- Avoid full intensity if pain/tightness/stiffness is present

Criteria for return to sport
- Full strength without pain
- Full ROM without pain
- Replication of sport specific movements near max speed
  without pain

Prevention

- Flexibility?
- Eccentric strengthening in routine training
- Nordic hamstring exercise
- SL physioball extensions

ROLL OUT, BALL OUT!!
Prevention

- **Neuromuscular control exercises for lower extremities and lumbopelvic regions** (Cameron, 2007)
  - High knee marching
  - Quick support running drills
  - Forward falling running drills
  - Explosive starts

References

- **Thank You!!**