

Relationship between Single Leg Landing and Ligamentous Knee Injury in Female Athletes

Alyssa Reidy, ATS, Shawn D. Felton, EdD, ATC, LAT

Florida Gulf Coast University, College Health Professions and Social Work, Fort Myers, FL 33965, agreidy9775@eagle.fgcu.edu, (813) 394-4680

Abstract

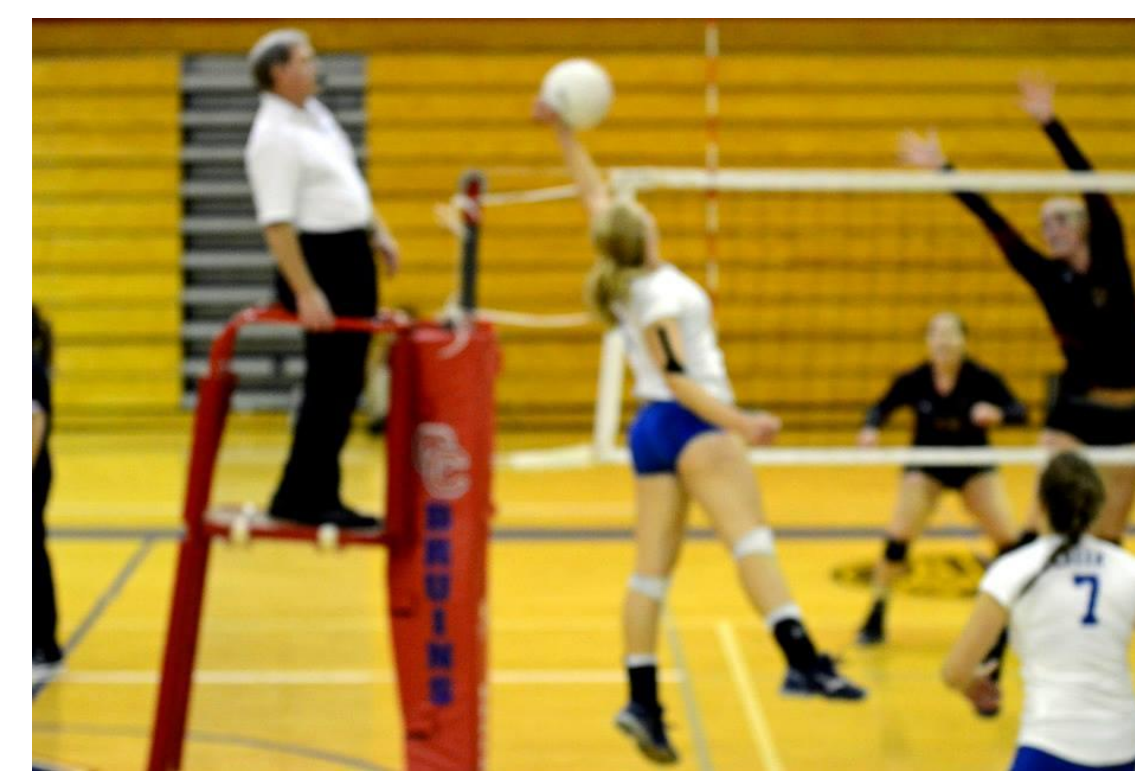
The presentation will discuss the identified reasons as to why female athletes present with a higher incidence of non-contact ACL injury, as well as identify strategies to prevent and reduce the risk of these types of injuries. An 18-year-old female collegiate volleyball player, with a past medical history of a grade III UCL sprain in her right elbow, left foot growth plate surgery on her big toe, and multi-ligamentous and medial meniscus repair presents with effusion and pain of the left knee. Female athletes participating in high risk sports (e.g. basketball, volleyball, soccer) are more likely to incur a non-contact ACL injury than their male counterparts. Research explains this phenomenon as an effect of anthropometric and hormonal factors; because these factors are non-modifiable, other explanations for the incidence of noncontact ACL injury in females must be identified and addressed in prevention and rehabilitation programs. Noncontact ACL injuries most commonly result from internal rotation of the knee with knee flexion, a movement that typically occurs after a jump landing, with a single leg jump landing being a more common mechanism than a double leg jump landing. Studies show that females present with an increased valgus knee angle and decreased lateral hamstring activation upon single leg landing as compared to males. Preventative programs should include neuromuscular training of the hamstring and calf musculature to improve muscular and biomechanical function of the knee joint upon a single-leg landing. This presentation contributes neuromuscular training exercises to improve proprioception of knee landing strategies.

Introduction

The athlete reported to the athletic training room complaining of left knee pain and swelling after participating in basic military training. Athlete instructed to temporarily discontinue volleyball and begin a strengthening program, and follow up in 4 weeks.

Clinical Presentation

- Athlete experiences daily mild knee pain during long bouts of standing, twisting motions, kneeling and going up and down stairs
- Pain with running and jumping
- Left knee effusion
- Slight laxity with posterior drawer (Grade I)



Purpose

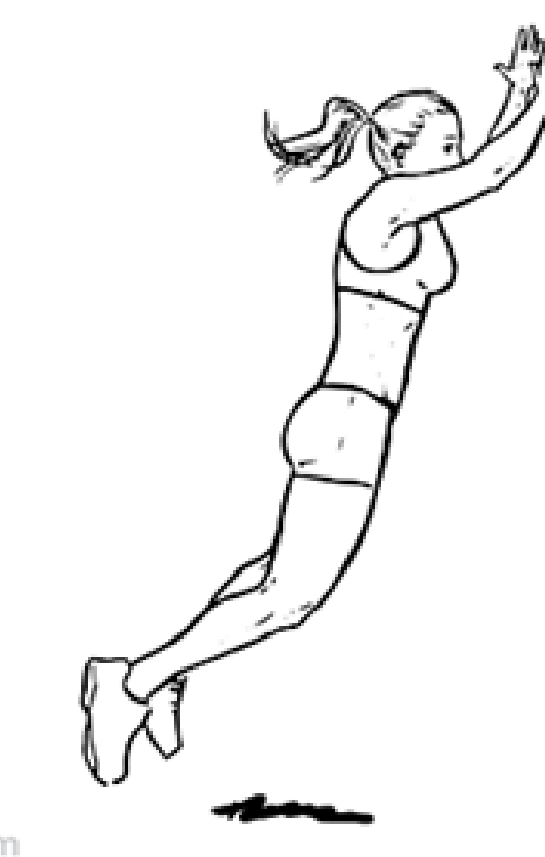
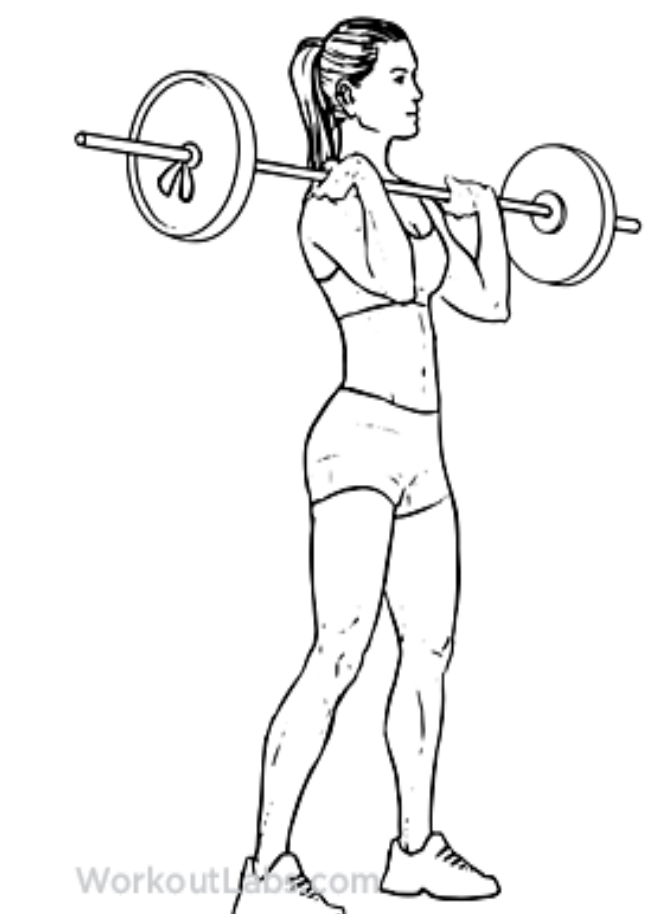
This case emphasizes the increased incidence of ligamentous knee injury in female athletes participating in high risk sports. Athletic trainers and strength and conditioning coaches must be aware of the underlying causes of ligamentous knee injury in female athletes, particularly ACL ruptures, and be aware of methods to decrease the risk of injury.

Treatment

Immediate treatment focused on reduction of pain and swelling. Interferential electrical stimulation and ice were used to reduce immediate swelling and any swelling secondary to the rehabilitation protocol.

Rehabilitation

Athlete performed a knee/ foot & ankle functional test before and after rehab protocol. Athlete began a phase II strengthening rehab program, then progressed into a phase III strengthening program, plyometric program, the progressive return to play protocol. Every session ended with 20 minutes of low impact cardio. Strengthening programs emphasized, but was not limited to, eccentric loading of the hamstrings and quadriceps musculature. Plyometric exercises emphasized on simultaneous double leg landing with simultaneous hip and knee flexion.



Conclusion

The case report presents the rare occurrence of a total tibiofemoral dislocation as well as the high incidence of ligamentous knee injury in female athletes participating in high risk sports. To satisfy the proper biomechanics of landing techniques and thereby, decrease the risk of injury to soft tissue knee structures neuromuscular training programs should focus on plyometric control of the hip flexor, knee flexor, and knee abductor musculature.