

Pediatric Anterior Cruciate Ligament (ACL) Reconstruction: Case Report

Rashid MZ¹, Hamat HH¹, Ismail I¹, Kamaluddin S¹, Hawa S²

¹*Department of Orthopedics, Hospital Sultanah NurZaherah, Jalan Sultan Mahmud, 20400, Kuala Terengganu, Terengganu.*

²*Department of Orthopaedics, Hospital Kuala Lumpur, Jalan Pahang, 50586 Kuala Lumpur, Wilayah Persekutuan*

Introduction

The higher participation rate of children and adolescents in competitive sports has led to an increase in knee ligamentous injury in the past decade, especially in anterior cruciate ligament (ACL). Several retrospective reviews have reported that children and adolescents account for 0.5–3% of all ACL injuries¹. Surgical management of ACL deficiency in children is complex due to the potential risk of injury to the physis and growth disturbance^{1,2}. We are reporting a case of total ACL injury in 13 years old girl following sport injury, with transphyseal ACL reconstruction using quadrupled hamstring autograft.

Case report

A 13-years old girl, presented with left knee swelling associated with pain following a netball tournament. The exact mechanism of injury was unsure. Following that she complained of occasional locking and instability of her left knee. On examination, the left knee appeared swollen with no obvious localized tenderness. The patella tapping and valgus stress test were positive. The anterior drawer's test revealed ACL laxity grade II with range of motion (ROM) 0-90 degree. Diagnostic arthroscopy of left knee has showed total ACL tear with elevated medial meniscus. She had underwent ACL reconstruction surgery using transportal all inside technique with autogenous quadrupled hamstring graft hold with tightrope ABS button (Arthrex). Total length of the graft is 55 mm and 8mm in diameter. The femoral tunnel and tibial tunnel was angled at 85 degree and 30 degree using pediatric set angle guide, under I/I guidance to avoid injury to the physis. Post operatively she was put on knee brace with ROM 0-60 degree. She was seen 6 weeks post operatively where the ROM of left knee able to achieve 90 degree of flexion with full extension.

Discussion

The management of ACL injury among paediatric age group involved conservative and operative management¹⁻³. We are reporting a case of successful paediatric ACL reconstruction using all inside graft technique. The controversial debate had arisen regarding the timing of surgery and surgical technique since the growth plate need to be anticipated¹⁻³. Delaying ACL reconstruction until maturity is possible but risks of instability episodes and intra-articular damage is inevitable. The goal of ACL reconstruction in children and adolescents is to provide long term stability to the knee while minimizing the risk of growth disturbance¹. The risk of growth disturbance is minimized when transphyseal tunnels are kept small and completely filled with soft tissue graft³. We performed complete transphyseal procedures of ACL reconstruction to this patient. The graft was placed close to the its natural foot print of ACL like in adult but the tunnel was angled slightly lower to avoid the injury to the epiphyseal plate but still allows isometric tunnel placement which may improve graft longevity and knee function.

Conclusion

Transphyseal ACL reconstruction with autogenous quadrupled hamstring graft yielded excellent functional outcomes without perceived clinical growth disturbance. With careful attention to surgical technique, pediatric ACL reconstruction can be safe and effective.