Arthroscopic Anterior Cruciate Ligament Reconstruction in a Case of Multiple Osteochondromatosis: A Case Report

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Learning Point of the Article:
ACL reconstruction in a case of multiple osteochondromatosis can be challenging. Keen attention to tunnel positions and correct choice of implants can result in a predictable outcome.

Abstract

Introduction: Osteochondroma is the most common benign bone tumor and usually occurs in the metaphyseal region of the long bones. Anterior cruciate ligament (ACL) tear is the most common ligament injury of the knee joint, and reconstruction of the ACL is the most commonly performed procedure in the knee joint nowadays.

Case Presentation: A 26-year-old male with multiple osteochondromas around the knees, shoulders, and ankles presented with a chronic ACL injury. Reconstruction of ACL using quadrupled hamstring tendon grafts was done. Anterior drawer and Lachman tests were negative postoperatively. The Cincinnati score increased from 180 to 310 at 3-month follow-up. This is a novel case report to describe ACL injury in a case of osteochondromatosis managed by an arthroscopic ACL reconstruction. The problems faced are discussed.

Conclusion: Our report highlights the fact that ACL tear may occur in a patient having osteochondromas around the knee. ACL reconstruction can be performed in routine fashion in such patients with particular attention to careful harvesting of grafts and tunnel placements.

Keywords: Anterior cruciate ligament reconstruction, anterior cruciate ligament reconstruction, osteochondroma, multiple osteochondromatosis.

Case Presentation

A 26-year-old male suffered trauma to his left knee 2 years back by fall of a heavy suitcase over his left knee. He developed pain and swelling in the knee in 5–6 h, which was managed just by anti-inflammatory drugs. He, however, had no relief and started experiencing giving away of the knee while walking and descending steps and occasional locking episodes. He underwent primary treatment with a general practitioner but
Radiographs of the knee revealed bony swellings of the left proximal tibia and left distal femur, which suggested osteochondromas (Fig. 1). Radiographs of other joints revealed osteochondromas of both ankles and shoulders (Fig. 2). MRI of the left knee revealed a bucket handle tear involving the posterior horn and body of the medial meniscus. A complete tear of the ACL is shown in Fig. 3. The diagnosis of osteochondroma was also confirmed on MRI.

The patient was operated under spinal anesthesia in a supine position with the leg hanging by the side. Anteromedial and anterolateral portals were used during the procedure. A 2.5 cm longitudinal incision just below and medial to tibial tuberosity was used for harvesting the hamstring tendons. Arthroscopy revealed normal synovium, a bucket handle tear of the medial meniscus, and a complete ACL tear (Fig. 4). Articular cartilages were pristine. No other intra-articular pathology was appreciated. The medial meniscus was treated by partial meniscectomy and balancing. Reconstruction of ACL using quadrupled semitendinosus and gracilis tendon grafts was done using fixed loop endobutton (Endo-CL, Smith and Nephew, Andover, MA) on femoral side and a titanium interference screw on the tibial side.

The problem faced by us was in graft harvesting. The tibial osteochondroma was underlying the pes insertion. There was difficulty in the identification of pes. A vertical 2.5 cm incision was taken for a better orientation of pes. Vertical incision was then identified, which was lying caudal to the medial tibial osteochondroma. Pes insertion was cut vertically, and semitendinosus and gracilis tendons where caught in a Kocher’s forceps. Tendons were freed from the fascial bands. It was difficult to maneuver the tendon stripper around the tumor. Finally, the stripper was passed to cross the tibial osteochondroma and retrieve the graft. Reaming for the tibial interference screw passed through the junction of the

never saw an orthopedic surgeon. On clinical examination, anterior drawer test and Lachman test were positive. Bony swellings were seen around the injured knee on the distal femur and proximal tibia, which were asymptomatic. The swellings measured approximately 5 cm in all dimensions. On further examination swellings were also noted in both shoulders and ankles. His pre-operative Cincinnati score was 180.

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Figure 1: Pre-operative radiographs of the affected knee. (a) Lateral view and (b) anteroposterior view. Arrows indicate the location of osteochondromas.

Figure 2: Anteroposterior radiographs of (a) right shoulder, (b) left shoulder, (c) right ankle, and (d) lateral radiograph of the right ankle. Each radiograph showing osteochondromas.

Figure 3: Pre-operative magnetic resonance imaging showing a sagittal view of the affected knee. Arrow indicates complete anterior cruciate ligament tear along with bucket handle meniscus tear.

Figure 4: Arthroscopy images showing (a) anterior cruciate ligament tear (hollow arrow) and posterior cruciate ligament (solid arrow) and (b) reconstructed anterior cruciate ligament (hollow arrow).

Figure 5: Post-operative radiographs (a) lateral view and (b) anteroposterior view of the knee. Arrow 1 showing endobutton over the lateral surface of the distal femur. Arrow 2 showing proper placement of interference screw at tibial tunnel opening.
Post-operative rehabilitation involved partial weight-bearing with a brace for 2 weeks followed by full weight-bearing. Active and active-assisted knee range of motion (ROM) with strengthening exercises were started on the 2nd day. At 2 weeks, operative wounds had healed well, and suture removal was done. At our last follow-up at 3 months, the Cincinnati score was 310. The ROM of the knee was a complete extension to 120° of flexion (Fig. 6). Lachman and anterior drawer tests were negative.

Discussion

We ran a comprehensive search on PubMed, Google, and Scopus for similar cases, but no such case of ACL injury in a case of osteochondroma was found. Musculoskeletal injuries associated with osteochondromas are rare, and involvements reported to date include snapping medial hamstring tendon, cystic involvement of ACL, rotator cuff tears, and subacromial, ischiofemoral, or femoroacetabular impingement [4, 5, 6, 7, 8, 9, 10, 11, 12, 13]. Intra-articular osteochondromas have also been reported earlier in the hip, ankle, and knee, but none associated with ACL tear [14, 15]. The previous reports of osteochondromas arising from ACL do not deal with an ACL injury and reconstruction. Alaqeel and Al-Ahaideb reported an osteochondroma originating from the tumor and normal bone. The purchase of the interference screw in the bone, however, was firm. Post-fixation probing of the graft revealed an adequately tensioned graft. Gentle, on table anterior drawer testing revealed correction of pre-operative status. There was no impingement of the graft in the femoral notch on full extension. Post-operative radiographs revealed the proper placement of interference screw at the tibial tunnel opening and endobutton over the lateral surface of the distal femur (Fig. 5). Post-operative rehabilitation involved partial weight-bearing with a brace for 2 weeks followed by full weight-bearing. Active and active-assisted knee range of motion (ROM) with strengthening exercises were started on the 2nd day. At 2 weeks, operative wounds had healed well, and suture removal was done. At our last follow-up at 3 months, the Cincinnati score was 310. The ROM of the knee was a complete extension to 120° of flexion (Fig. 6). Lachman and anterior drawer tests were negative.

Clinical Message

ACL reconstruction can be performed in routine fashion in patients with osteochondromas around the knee. Special attention is to be given while harvesting a graft from the medial aspect of the proximal tibia and tibial tunnel placements near the location of osteochondroma at the proximal tibia.

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Conclusion

Our report highlights the fact that ACL tear may occur in a patient having osteochondromas around the knee. ACL reconstruction can be performed in routine fashion in such patients with special attention to careful harvesting of grafts and tunnel placements.
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