

A Technique for Arthroscopic Osteochondral Autograft Transplantation of the Hip



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Abstract: Osteochondritis dissecans of the hip is a rare condition with limited treatment options. For patients who have undergone arthroscopic microfracture and chondroplasty, long-term results showing clinical improvement are scarce. Although open osteochondral grafting is a demanding and invasive procedure, promising results are reported after short-term follow-up. We present a technique for an arthroscopic autologous osteochondral transplantation with a graft from the ipsilateral knee to the femoral head.

Osteochondritis dissecans of the hip is a rare condition with limited treatment options.¹⁻³ For patients who have undergone arthroscopic microfracture and chondroplasty, long-term results showing clinical improvement are scarce.² Although open osteochondral grafting is a demanding and invasive procedure, promising results have been reported after short-term follow-up.^{3,4}

In patients with osteochondritis dissecans, 2% of the defect is located on the femoral head.² Arthroscopic treatment options are limited to microfracturing or chondroplasty.³ Chondroplasty is performed in the setting of a partial-thickness defect.³ Microfracturing is indicated for patients with a focal degenerative or osteochondral lesion, typically <4 cm in diameter, similar to the criteria generally accepted for the knee.³ In patients in whom the femoral head is not affected who do not have arthritis, favorable results are observed after a follow-up of 20 years. In patients with osteoarthritis, the postoperative success rate decreases dramatically.⁵

With respect to the knee, osteochondral autograft transplantation is a well-established technique in the

treatment of chondral and osteochondral defects. Although technically demanding, excellent results have been achieved in patients with osteochondritis dissecans.⁶

With respect to the hip, Girard et al.⁴ treated 10 young patients with osteochondral lesions of the femoral head with an osteochondral mosaicplasty through a trochanteric flap with dislocation of the hip. At 2 years, the patients showed clinically significant improvement. Radiographically, all plugs were incorporated. However, this procedure is technically demanding and invasive because of the temporary luxation of the femoral head. Similar outcomes are reported in a review of the literature by Anthonissen et al.⁷ This article describes a technique for an arthroscopic autologous osteochondral



Fig 1. The patient shown is undergoing left hip surgery. The operation is performed after standard induction of general or spinal anesthesia with the patient in the supine position on a radiolucent table.

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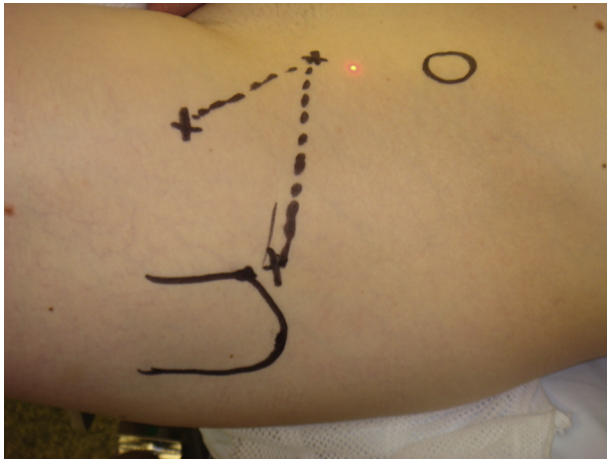


Fig 2. The patient shown is undergoing left hip surgery. A wide perineal post is used and the ipsilateral arm is crossed over the body. Anatomic landmarks and portals (anterolateral and anterior) are marked with use of fluoroscopy.

transplantation with a graft from the ipsilateral knee to the femoral head.

Surgical Technique

Patient Preparation

After standard general or spinal anesthesia has been induced, the patient is positioned supine on a standard radiolucent traction table (Fig 1). A wide perineal post is used, and the ipsilateral arm is crossed over the body. Anatomic landmarks and portals (anterolateral and anterior) are marked with the use of fluoroscopy (Fig 2). Traction is applied with internal rotation of 15° to 25°, and the patient's hip is prepared and draped in standard sterile fashion.

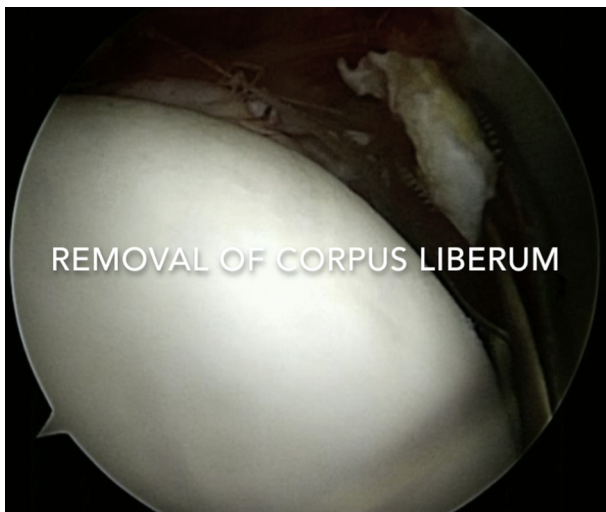


Fig 3. Removal of the corpus liberum.



Fig 4. Locating and cleaning the defect with the radiofrequency probe.

Diagnostic Arthroscopy

After a sufficient anterolateral portal has been established under fluoroscopy, a 70° arthroscope is introduced and used to make the anterior working portal under direct vision. Capsulotomy and standard diagnostic arthroscopy are performed. The osteochondral loose body is located and removed (Fig 3, Video 1).

Preparation of the Osteoarticular Defect

The osteoarticular defect is located and debrided with a monopolar radiofrequency probe (Vulcan; Smith & Nephew, Andover, MA) (Fig 4). A hollow drill is used to extract a cylinder-shaped plug with a diameter of 8 mm and a depth of 15 mm from the center of the defect (Fig 5). Depth is measured after the cancellous bone has been impacted (Fig 6).

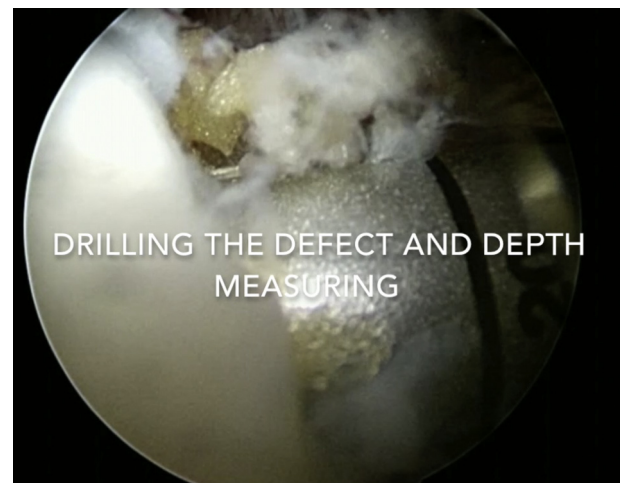


Fig 5. Drilling and measuring the depth of the defect.

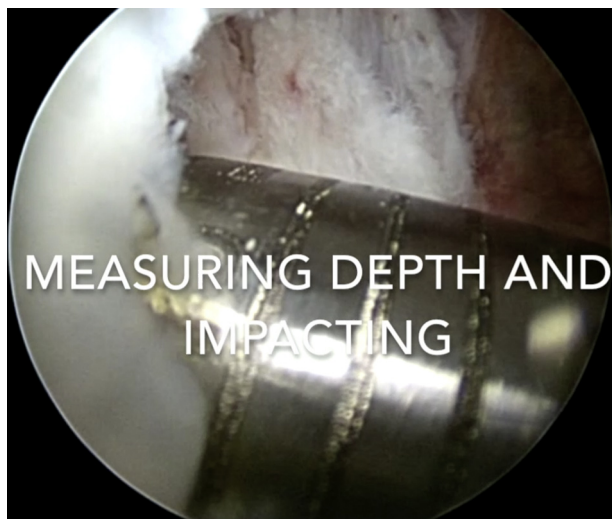


Fig 6. Measuring the depth after impaction.

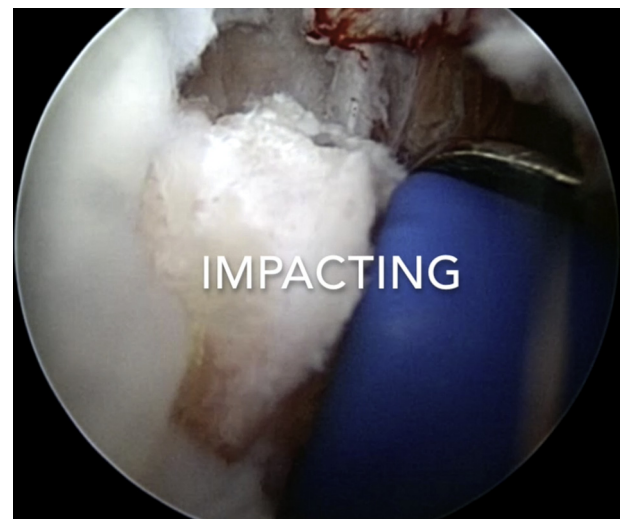


Fig 8. Impacting the graft up to the articular surface.

Harvesting the Osteochondral Allograft

A mini-arthrotomy of the ipsilateral knee is performed. After identification of the proximal, non-weight-bearing lateral femoral area of the knee, an osteochondral donor graft with a diameter of 8 mm is harvested by using a bone graft harvester set (Osteochondral Autograft Transfer System; Arthrex, Naples, FL).

Graft Placement

The graft is inserted through the anterior portal and impacted with an impactor (Arthrex) (Figs 7 and 8). Roughly two-thirds of the surface is reconstructed anatomically.

Extra-articular Evaluation

Standard extra-articular evaluation is performed, and no capsular closure is necessary. After removal of the

portals, the wounds are closed with nonabsorbable sutures.

Postoperative Treatment

A standard postoperative physical therapy protocol, similar to the postoperative protocol for an arthroscopic labral repair, is advised (4 weeks of non-weight-bearing and mobility exercises).

Discussion

An arthroscopic autologous osteochondral transplantation with a graft from the ipsilateral knee to the femoral head can be a good option for treatment of osteochondritis dissecans of the hip when conservative therapy or arthroscopic microfracturing is ineffective.

Because, in our opinion, an open procedure is too invasive, we decided to perform the transplantation arthroscopically. A limitation of this technique is that we believe that arthroscopic osteochondral transplantation should be limited to defects in an antero-lateral location. Pearls and pitfalls of the described technique are shown in Table 1 and a list of advantages and limitations is shown in Table 2.

Table 1. Pearls and Pitfalls of Arthroscopic Osteochondral Autograft Transplantation of the Hip

Pearls

Clear excess/good exposure is essential. Capsulotomy and debridement using a shaver and/or radiofrequency probe can be helpful.

Intraoperative fluoroscopy assistance can be helpful when the graft is placed in 90° on the articular surface.

Pitfall

The surgeon should be sure to hold the harvesting device 90° to the donor site to make sure the allograft has the best fit for the defect.



Fig 7. Placement of the graft.

Table 2. Advantages and Limitations of Arthroscopic Osteochondral Autograft Transplantation of the Hip**Advantages**

- Arthroscopic osteochondral autograft transplantation is less invasive than an open procedure.
- Early rehabilitation/recovery can be achieved compared with an open procedure.

Limitation

- Arthroscopic osteochondral transplantation is limited to an anterolateral location of the defect.

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