On-line Case Report

Patellar reconstruction using posterior femoral condyle: a 5-year follow-up

YASER JABBAR, ANGEL RUIZ

Department of Orthopaedics, St Bernard's Hospital, Gibraltar

A patient with rheumatoid arthritis presented to clinic with an increasingly painful knee. The patient had undergone patellectomy for patellofemoral arthritis 10 years previously. After knee arthroscopy showing extensive arthritic changes, it was decided to offer primary arthroplasty of the knee with patellar reconstruction using posterior lateral femoral condyle graft taken at the time of arthroplasty. The positive outcome from this case is encouraging and constitutes a further option in patients with prior patellectomy undergoing knee arthroplasty.

Keywords: Patellar reconstruction – Posterior femoral condyle – Knee arthroplasty – Rheumatoid arthritis

Case report

A 51-year-old woman with rheumatoid arthritis presented to clinic with an increasingly painful knee. The patient had undergone patellectomy for patellofemoral arthritis 10 years previously. The patient achieved some relief with this procedure but, in the intervening time, her symptoms had deteriorated. In the last 8 months, she had increasing pain and was unable to sleep. After knee arthroscopy showing extensive arthritic changes, the decision was taken to offer her primary arthroplasty of her knee with patellar reconstruction using posterior lateral femoral condyle graft taken at the time of arthroplasty.

The patient underwent a standard total knee arthroplasty with patellar reconstruction as described below. Tracking of the new patella was satisfactory intra-operatively and arthroplasty was completed. Postoperative care was as per standard protocol for primary total knee arthroplasty with straight leg raises, flexion exercises and full-weight bearing the next day.

The patient was seen at 6 weeks, 1 year, 2 years and 4 years from knee arthroplasty. The patient remains

Figure 1 Skyline view of knee at 5 years' postoperatively.

symptom free, with no anterior knee pain and no symptoms of instability.

On examination, the knee was pain free to palpation with a full range of motion of 0–100° flexion as standard with the implant used. There was no extensor lag and the

Correspondence to: Yaser Jabbar, 6 Aldenham Drive, Uxbridge UB8 3UA, UK
E: jabbar@doctors.net.uk

new patella tracked well. The patient had power 5/5 on the operated side on the MRC scale.

Serial plain radiographs showed the patella to still be present with no evidence of resorption or displacement at 5 years (Fig. 1).

Technique

Access was via a standard anterior skin incision with a medial retinacular incision in a shape as if the patella was present. After standard knee arthroplasty, a pouch was created in the patellar tendon via a medial incision. Inferosuperior alignment was determined by marking the position of the tendon during full flexion and extension. The graft was placed so as to lie in the distal trochlear groove of the prosthesis in full flexion. Mediolaterally, the patella was placed to lie in the groove in order to allow good tracking. The femoral condyle graft was prepared, perforating 6 times on the cut surface without penetrating the articular surface using a 1.6-mm drill. The graft was inserted with the convex articular surface facing the trochlear groove and sutured in position with 0 Vicryl, passing the suture through fine drill holes in the periphery of the graft. Once in position, the graft was clinically tested for correct level of placement within the tendon, taking care to avoid patella alta or baha, stable tracking and strength of fixation. The patellar tendon was closed around the graft prior to closure of the retinacular incision.

Discussion

Total knee arthroplasty is a common procedure; at least 300,000 procedures are undertaken in the US alone every year.¹ Elements considering stability and arthroplasty design are still the subject of intense research and debate. Whilst many designs accept the sacrifice of an often suboptimal ACL, the patella is an assumed part of overall knee stability. Many centres are investigating the design and benefits of patellar resurfacing as part of primary knee arthroplasty procedures. However, as patellectomy is a relatively rare procedure now, relatively little work has been done on the subject of patellar grafting or reconstruction.

Patellectomy is shown to be an effective procedure in only about half of osteoarthritis patients and 60% of those studied are found to have decreased function in the postoperative limb in the long-term.²⁻⁴ Joshi *et al.*⁵ showed

that, post-patellectomy, total knee arthroplasties have a higher rate of complications and inferior results. It is almost universally agreed now that patellar sparing procedures are to be preferred. However, this still leaves the problem of those patients who have already undergone patellectomy, or those that necessitate patellectomy as a result of trauma.

Taking into account the work undertaken regarding the patella in respect of primary knee arthroplasty, the authors feel these patients should be offered some form of patellar reconstruction. To our knowledge, using extensive Pubmed and Medline searches, this has not been previously described.

The medial access patellar retinaculum pouch as described has proven, in this case, to be a satisfactory procedure for non-vascularised femoral condyle grafting and has had the effect of enhancing post-arthroplasty stability.

Potential problems with such a procedure are poor selection of bone graft that does not allow good tracking or causes increased pain due to position in the pouch or relative to the anterior femoral groove. Further problems can arise from deficient anchoring of the graft within the pouch and subsequent dislodgement. There is potential for non-vascularised bone to be resorbed leaving the patient with a deficient post-arthroplasty knee with attendant problems of re-operation on a non-native joint. Further areas that have not been investigated are long-term outcomes of the graft beyond 5 years, especially in the instance of trauma to the 'new' patella and potential healing problems.

We think that the positive outcome from this case is encouraging and constitutes a further option in patients with prior patellectomy undergoing knee arthroplasty.

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