

Case Report

Extra-articular migration of the patellar component following total knee arthroplasty

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SUMMARY

Complications related to patellar resurfacing are well recognized. We present an unusual case where the patellar button, after separating from the patella, extruded from the knee joint to lie within the extra-articular soft tissues.

Key words: patella, extra-articular, resurfacing, dislocation.

CASE REPORT An 85-year old male presented with a two week history of a painless swelling on the anterior aspect of his left knee. He had first sought orthopaedic attention for his left knee in 1984 when it was painful. A right total hip replacement had been performed earlier that year. X-ray of the left knee revealed osteoarthritis with patellofemoral degeneration and chondrocalcinosis. A synovectomy was performed through medial and lateral parapatellar incisions in the same year. After initial improvement pain returned. In 1995 an Insall-Burstein II (Zimmer, Warsaw, Indiana, USA) total knee replacement with patellar resurfacing was performed. It was



Fig 1. Photograph of left knee in flexion demonstrating the preoperative appearance (note tenting of the overlying skin).



Fig 2. Lateral radiograph of left knee, demonstrating separation of the patellar prosthesis from the patella.

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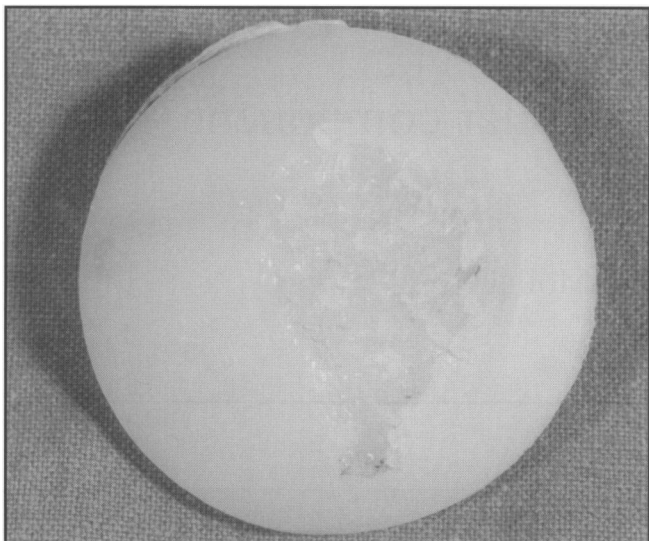


Fig 3. Patellar button as removed at operation (note the degree of wear on the femoral bearing surface).

recorded in the operation notes that there was considerable varus deformity of the knee and an extensive medial release was required when performing the total knee replacement. A stable knee joint was obtained without undue tension and the surgeon was satisfied with the patellar tracking. Post-operative recovery was uneventful. During the five years following the operation no pain was reported in the knee.

On examination of the swelling which had appeared, a well defined, hard, mobile, sharp edged swelling was evident over the anterior aspect of his left knee which became more prominent on knee flexion, with blanching of the skin (Figure 1). Radiographs revealed separation of the polyethylene button from the patella (Figure 2). At operation via a minimal skin incision utilizing the old scar, the patellar button was found extra-articularly within the soft tissues. A local defect was noted in the lateral retinaculum. The button was retrieved (Figure 3) and the defect closed with interrupted vicryl sutures.

Unfortunately there was a significant herniation of synovium through this defect at review four months later.

DISCUSSION

The role of patellar resurfacing in knee arthroplasty remains controversial.^{1,2} Reported complications include patellar necrosis and fracture, extensor mechanism rupture, implant loosening, patellar subluxation and dislocation.³

In previous reports the patellar component has remained intra-articular.⁴ Our case is unusual in

that the patellar prosthesis button-holed through the lateral retinacular fibres to lie in the extra-articular soft tissues with evident tension on the scar. The potential for overlying skin necrosis was significant. Simple retrieval was performed via a minimal incision.

The relationship between the articulating surface of the patellar and femoral components of a knee replacement is of great importance in the development of complications. The articular surface of the patella must conform with the geometry of the femoral component. With an all-polyethylene dome prosthesis, as was used in this case, small contact areas with the femoral component and high contact stresses are common.⁵

Hsu and Walker⁶ designed a machine to replicate the forces applied to the patellar component during flexion and extension of the knee. They found that the contact areas of polyethylene patellae increased rapidly due to deformation. Such creep deformation reduces contact stresses. However, the underlying supporting surface also became subject to deformation. They concluded that all-polyethylene patellar domes with low conformity with the femoral condyles are prone to deformation with potential for failure of the underlying bone and loosening.⁶ We postulate that patellar dome deformation, as seen in Fig 3, led to deformation of the underlying bone followed by loosening and then separation of the patellar dome. Weakness of the lateral retinacular fibres probably resulted from incision at the previous synovectomy and allowed extrusion of the patellar component into the extra-articular soft tissues.

REFERENCES

1. Barrack RL, Wolfe MW, Waldman DA, Bertot AJ, Myers L. Resurfacing of the patella in total knee arthroplasty. A prospective, randomized, double-blind study. *J Bone Joint Surg Am* 1997; **79-A(8)**: 1121-31.
2. Kewish PA, Varma AK, Greenwald AS. Patellar resurfacing or retention in total knee arthroplasty. A prospective study of patients with bilateral replacements. *J Bone Joint Surg Br* 1994; **76-B(6)**: 930-7.
3. Vince KG, McPherson EJ. The patella in total knee arthroplasty. *Orthop Clin North Am* 1992; **23(4)**: 675-85.
4. Sutherland C J. Patellar component dissociation in total knee arthroplasty. A report of two cases. *Clin Orthop* 1988; **(228)**: 178-81.

5. Amis AA. Patello-femoral joint replacement. *Curr Orthop* 1999; **13**: 64-70.
6. Hsu HP, Walker PS. Wear and deformation of patellar components in total knee arthroplasty. *Clin Orthop* 1988; (**246**): 260-265.