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Arthroscopic treatment of patellar symptoms in posterior stabilized total knee replacement

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Abstract Twenty-one patients with patellar symptoms had arthroscopic treatment. Symptoms included frank patellar clunk and painful patellofemoral crepitus. All patients had posterior stabilized total knee replacement (TKR). The average onset of symptoms following TKR was 17 (range 3–75) months. All patients were referred to physiotherapy treatment before arthroscopic treatment. The average duration of symptoms prior to arthroscopic treatment was 23 (range 4–92) months. All patients were satisfied with resolution of symptoms at average follow-up of 32 (range 12–52) months. No complications were encountered; however, one patient had recurrence of a painful patellar crepitus 8 months after arthroscopy.

Résumé Vingt et un malades avec des symptômes rotuliens ont eu un traitement arthroscopique. Tous les malades avaient une arthroplastie totale du genou postéro-stabilisée. Les symptômes ont inclus le ressaut patellaire audible (clunk syndrome) et crépitement patellaire douloureux. Le début moyen des symptômes après le remplacement prothétique du genou était de 17 mois (3–75 mois). Tous les malades ont eu de la physiothérapie avant le traitement arthroscopique. La durée moyenne des symptômes avant l'arthroscopie était 23 mois (4–92 mois). Tous les malades ont été satisfaits avec disparition des symptômes à un délai moyen de 32 mois (12–52 mois). Aucune complication n'a été rencontrée. Cependant, un malade a eu la récurrence d'un crépitement rotulien douloureux 8 mois après l'arthroscopie.

Introduction

Patellar clunk syndrome is present when the patient experiences a painful and sometimes audible “clunk” of the

patella on active extension of the knee following total knee replacement (TKR) [1, 4]. This syndrome occurs in TKR of posterior stabilized design only. It is a type of peripatellar fibrous hyperplasia characterized by a discrete suprapatellar nodule. This nodule lodges into the intercondylar notch of the femoral component during flexion and dislodges on extension with an audible and often painful clunk. The causes of patellar clunk syndrome are believed to be multifactorial. These include design of prosthesis, extent of surgical trauma, alteration of joint line, patellar height, patellar thickness, and patellar tracking [1, 3, 4]. Arthroscopic treatment for patellar clunk syndrome has been reported with some encouraging results [2, 3, 6].

Besides presenting with frank patellar clunk syndrome, some patients present with painful patellofemoral crepitus or clicking and diminished range of motion of the knee. The cause of the diminished range of motion is sometimes related to the painful clicks or clunks, and is not actual arthrofibrosis of the knee.

In this prospective study, we report the results of arthroscopic treatment on a spectrum of symptoms attributable to the patellar clunk-like symptoms following TKR in 21 patients with a mean follow-up of 32 months.

Materials and methods

We started treating patients with frank patellar clunk syndrome arthroscopically in 1996. Before that time, patients with patellar clunk syndrome were treated by open arthrotomy. This study included 21 patients, all of whom had TKR with posterior stabilized design. They had patellar symptoms and signs either in the form of frank painful patellar clunk or painful patellofemoral crepitus upon extension of the knee. Chief complaints were pain and a sense of catching on the patella. Some patients felt the sense of catching or the blocking at the patella so much that they were unable to actively extend the knee. Albeit, they could extend the knee passively with the help of the contralateral leg, and often this maneuver

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Fig. 1 Fibrous nodule at the superior pole of patellar component

Fig. 2 Appearance of the patellar component after removal of the fibrous nodule

caused pain. Radiographs including anteroposterior, lateral, and skyline views were taken to exclude the possibility of loosening, fractures, or malposition of the patella component. Patients with frank patellar dislocation were also excluded. Blood tests and sometimes knee aspirations were done to rule out sepsis. The diagnosis, however, was often made clinically after exclusion of the above. All patients had a trial of nonoperative treatment, including nonsteroidal antiinflammatory drugs and

physiotherapy. Arthroscopic treatment was offered to patients with persistent symptoms.

Procedure

Prophylactic antibiotic cefazolin 1 g was given intravenously on induction of anesthesia. A thigh pneumatic tourniquet with 250 mm/Hg was applied during the procedure. An arthroscope 5.5 mm in diameter was first inserted with utmost care, avoiding damage to the prosthesis, in the anterolateral portal for viewing. Subsequent arthroscopic debridement of the fibrous nodules and adhesions required the utilization of the peripatellar four portals using arthroscopic scissors, punch forceps, and motorized shavers (Figs. 1 and 2). No drain was used postoperatively. Patients were encouraged to mobilize as tolerated the next day. No formal physiotherapy was given.

Results

There were 21 patients with 21 posterior stabilized TKRs. Twelve TKRs were performed for primary osteoarthritis of the knee while nine were performed for patients with rheumatoid arthritis. Average age at the time of TKR was 64 (32–81) years. Male-to-female ratio was 5:16, and average duration of onset of symptoms following TKR was 17 (3–75) months.

Eleven patients had typical painful patellar clunks at 30–40° on active extension. Five patients felt painful patellar crepitus on active extension but without frank patellar clunk. Five patients experienced inability to extend the knee actively and felt a painful “block” at 30–40°; full extension was possible only with assisted active extension by the other leg, and this process was associated with a painful patellar clunk. All patients were referred to physiotherapy treatment before arthroscopic management. Average duration of symptoms prior to arthroscopy was 23 (4–92) months, and average follow-up was 32 (12–52) months.

Average tourniquet time for the operation was 48 (35–90) min. The fibrous nodule at the proximal patellar component described by Hozack et al. [4] was observed in all patients while the fibrous bands described by Thorpe et al. [5] were observed only in four of the knees. Average time to achieve preoperative range of motion was 3.5 (2–6) days; postoperative range of motion was no different from the preoperative range. Only one patient required intramuscular analgesia postoperatively. No operative complications were encountered.

All patients had resolution of patellar symptoms and were satisfied. The average Knee Society Functional Assessment Score increased from 80 to 95, and this increase was largely attributable to the improvement in stair-walking ability. Only one patient had recurrence of symptoms of painful patellar crepitus, which occurred 8 months after the arthroscopy. She had another arthros-

copy 3 months after symptom recurrence; operative findings included a residual fibrous mass at the superior pole of the patellar prosthetic component and tight lateral retinaculum. In the latest follow-up of this patient, she had residual patellofemoral crepitus that was, however, not painful.

Discussion

Before 1996, post-TKR patellar clunk syndrome was managed in this department by open arthrotomy. At that time, we encountered seven painful patellar clunks, which were managed by arthrotomy and excision of the offending fibrous nodule and adhesion. Although it was effective in treating the symptoms of "clunk" and had successful results without recurrence, there were morbidities associated with this approach such as wound complication and delay in regaining range of motion. The requirement of postoperative analgesics for pain control was higher, and the length of hospitalization was often prolonged (range 20–59 days).

Advantages of using arthroscopy in treating patellar clunk syndrome included clear visualization of the pathology and few associated complications. The recovery period required for patients to regain full range of motion and normal activity was shorter. The fibrous nodule at the proximal patellar component described by Hozack et al. [4] was observed in all of our patients. This led us to believe it was the main cause of the patellofemoral symptoms. The fibrous bands described by Thorpe et al. [5] were observed only in four knees and could be related to the crepitus rather than the patellar clunks. Impinging synovitis was often encountered in association with the patellar nodule. However, the synovitis itself could easily be removed with a motorized shaver. It was difficult to quantify the amount or volume of the fibrous nodule, the amount of impinging synovitis, and their association to the severity of the patellar symptoms, although these were probable and could explain the spectrum of severity of clinical symptoms.

On the technical side, the suprapatellar joint space and the medial and lateral gutters were often contracted.

Adhesion around them were debrided, first to make room for instrument insertion and then for the subsequent debridement of the dense fibrous nodules. Instrument insertion into the suprapatellar space and parapatellar gutters could therefore avoid causing iatrogenic damage to the surface of the prosthesis. The fibrous nodules were tough. Punch forceps and scissors were needed to shred them before the motorized shaver could debride them effectively. Care must be taken to avoid damaging the prosthesis components, as the potential risk of increasing the rate of wear of the prosthesis is theoretically possible.

No infection or significant complications were associated with the arthroscopic treatment in this series when a single-dose, preoperative, intravenous antibiotic was used. Diduch et al. [3] recommended 24 h antibiotic cover, and he had no infection in his series.

In our series, we made the provisional diagnosis of patellar clunk syndrome before the arthroscopy and performed only therapeutic arthroscopy. We did not perform diagnostic arthroscopy on patients with vague symptoms of knee pain, as we believed the benefit of the arthroscopic examination was limited in terms of both diagnosis and being therapeutic.

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