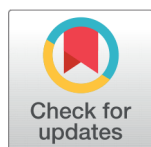


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Patella clunk syndrome in posterior stabilised total knee arthroplasty

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Abstract

Patellofemoral complications (range from 5-55%) are probably the most common cause of unsatisfactory result after total knee replacement (TKR). From 2007 to 2009, 5 patients (6 knees) were diagnosed, out of 418 operated, with patellar clunk syndrome (incidence of 1.4%). There were 3 women and 2 men whose average age was 63.5 years (range, 53-74 years). The patella clunks were reported at an average of 7.5 months (range, 3-12 months) after TKR. All patients were evaluated clinically using the knee society score. Preoperative and postoperative radiographs were reviewed. Joint line height was measured according to Figgie et al. Patellar height was evaluated using the Insall-Salvati ratio. All patients were followed up for one year. 2 patients who got operated and 1 conservatively treated patient were free of patellar clunk at 1-year follow up. The average preoperative and postoperative knee scores were 64 and 93 points respectively in operated and one conservatively treated patient. In other two conservative treated patients the average knee scores were 65 at the beginning of study and 70 points at 1-year follow up, they were advised for surgery. The etiology of patellar clunk is multifactorial and probably related to the design of the prosthesis, surgical trauma and component position.

Keywords: Patellar clunk; total knee replacement

1 INTRODUCTION

Patellofemoral complications (range from 5-55%) [1] are probably the most common cause of unsatisfactory result after total knee arthroplasty (TKA). [2] Patellofemoral complications are an indication for up to 29% of all TKR revision procedures [1]. First coined by Hozack [3], the patellar clunk syndrome describes painful catching, grinding or jumping of the patella when the knee is moving from a flexed to an extended position,

approximately at 30-45 degrees from full extension [2-4]. It is caused by overgrowth of a fibrous nodule on the superior aspect of the patellar button, and is usually seen from three to nine months after the operation. [4]

It has mainly but not exclusively been associated with posterior stabilised (PS) TKR, whether or not the patella was resurfaced⁵. The purpose of this study is to report about patellar clunk syndrome in posterior stabilised total knee arthroplasty

2 MATERIALS AND METHODS

From 2007 to 2009, 5 patients (6 knees) were diagnosed with patellar clunk syndrome (PCS) requiring treatment. The diagnosis of patella clunk syndrome was based on clinical examination [3]. During the same 2-years period, 418 total knee arthroplasties were performed. Senior arthroplasty surgeon has performed all the primary total knee arthroplasty surgeries. In this study all 418 total knee arthroplasties were cemented and all the patellae were resurfaced. We have excluded patients who underwent revision total knee arthroplasty. 2 patients (6 knees) underwent arthroscopic debridement and 3 patients underwent conservative line of treatment (as these patients denied any kind of surgery) in the form of quadriceps strengthening, straight leg raising and range of motion exercises and no steroid injection. All patients were evaluated preoperatively, 4 weeks postoperatively and after one year.

The study population included 3 women and 2 men whose average age was 63.5 years (range, 53-74 years). The left knee was involved in 4 cases and right knee in 2 cases. The original diagnoses that lead to total knee arthroplasties was osteoarthritis in all 5 patients of patellar clunk syndrome. All patients complained of an audible, anterior painful clunk and anterior knee pain. The patellar clunks were reported at an average of 7.5 months (range, 3-12 months) after total knee arthroplasty.

All patients were evaluated clinically using the knee society score. [5] Preoperative and postoperative radiographs were reviewed. Joint line height was measured according to Figgie et al. [6] Patellar height was evaluated using the Insall-Salvati ratio. Two patients of patellar clunk opted for surgery and other patients preferred only conservative treatment.

Arthroscopic debridement was done through standard anteromedial and anterolateral portals. A hypertrophic, firm nodule was found at the junction between the superior pole of the patellar button and the quadriceps tendon of all the patients. This nodule was found to impinge on the anterior flange of the femoral component during flexion and dislodged from the notch at 30 – 45 degrees from full extension. The disorder resolved after nodule excision. The nodule and hypertrophic synovium was excised, taking extreme caution to avoid iatrogenic damage to the polyethylene patellar button. In all 5 patients' patellar component was seen centrally located without any overhanging superiorly and no loosening. None of the operated patients required any patellar component revision or soft tissue realignment procedures. All the procedures were done under tourniquet control. Patients received one preoperative dose and two postoperative doses of antibiotics. All patients went home on first postoperative day (see Figures 1, 2, 3, 4 and 5 and Table 1).

3 RESULTS

All patients were followed up for one year. 2 patients who got operated and 1 conservatively treated patient were free of patellar clunk at 1-year follow up. No patient underwent subsequent procedures during study period. There were no surgery related infections or complications. Other two conservatively treated patients continue to have pain at 1-year follow up. Both were advised for surgery. There was no significant change in range of motion of affected knee. The average flexion was 105 degrees (range, 100-110 degrees) preoperatively and 107.5 degrees (range, 100-115 degrees) postoperatively (includes conservatively treated group also).

The average preoperative and postoperative Lysholm knee scores were 64 and 93 points respectively in operated and one successfully conservatively treated patient. In other two conservative treated patients, with unsuccessful result, the average knee scores were 65 at the beginning of study and 70 points at 1-year follow-up. No patient in this study was lost to follow-up.

Radiographic evaluation showed a preoperative joint line distance of 10.5 mm (range, 10-11mm) compared with 11.5mm (range, 11-12 mm) postoperatively. No knee had patella baja or patella alta. Femoral components didn't show any flexion. Two patients had patellar mal-tracking of 30 degrees each, in which one patient was in surgical treated group, in whom lateral release was done.

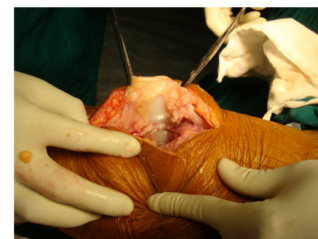


Fig 1. Note fibrous nodule at the superior pole of patellar button

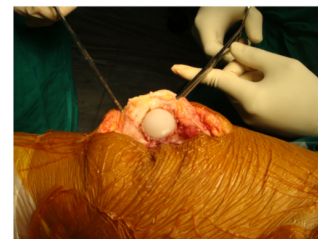


Fig 2. After removal of fibrous nodule

RADIOGRAPHS



Fig 3. AP view



Fig 4. Lateral view to see for patellar component overhanging, patellar button loosening

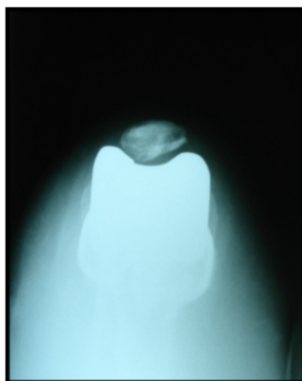


Fig 5. Sky line view showing patellar tilt

4 DISCUSSION

The diagnosis of patella clunk syndrome was based on clinical examination [4] since radiological abnormalities are rare (like loose patellar button & proximally placed button). Doppler ultrasound has recently been used as a possible adjunct to diagnosis [7].

The differential diagnosis of anterior knee pain after TKR is patellar subluxation or dislocation, patellar fracture, component loosening, infection, arthrofibrosis, impinging synovitis and patellar clunk. [3, 4, 8]

Incidence of patellar clunk syndrome in our study is 1.4%, in other studies reported between 1.3% to 3.9% [4, 8, 9].

The nodule is clearly the offending agent; however, the etiology of this nodule is not defined so easily. The nodule is presumed to result from inflammation at the quadriceps insertion with subsequent fibrous tissue proliferation [4]. Proximal patellar button overhang originally was thought to be a predisposing factor [2–4] was not seen in our cases. The femoral component design is implicated as a causative factor [2–4, 7, 8, 10] reported more commonly with first generation femoral components (high sharp femoral sulcus) and also seen with second generation. Only one of the four patients who had bilateral PS-TKR developed bilateral patellar clunks. We found this syndrome more common with PFC-Sigma (Depuy) design and none reported with Nexgen-LPS (Zimmer) design. This suggests that the cause of the disorder cannot be solely attributed to component design. Patellar maltracking can at times be the cause of the syndrome, but unlikely [7]. In the present series, there were no recurrences of patellar clunk at 1-year after surgery. If the design of the prosthesis were the only etiologic factor in the development of the nodule, then one would expect more recurrences because the prosthesis was not changed.

Alteration of the joint line, patellar height, patellar maltracking and patellar thickness are thought to contribute to this disorder. In the present study, no patient had significant change in joint line or patellar height. Patella baja can produce this syndrome [7].

The next question to be answered is - is resurfacing of patella can be avoided in posterior stabilised - total knee arthroplasties to prevent patella clunk syndrome? The answer is clearly no according to Shoji et.al [11]. It has mainly but not exclusively been associated with posterior stabilised (PS) TKR, whether or not the patella was resurfaced.

Though there are advantages of arthroscopic debridement of patellar clunk in the form of

- a) reduced wound complication
- b) early regaining of ROM
- c) less requirement of postop analgesia and
- d) reduced length of hospitalisation;

fibrous nodule is tough, it is difficult to remove them with punch forceps, shavers & scissors in arthroscopy so residual mass is common with arthroscopy and recurrence rate in arthroscopic debridement

Table 1. Data on patients with patella clunk syndrome

Patient	Age / sex	Side affected	Etiology	Implant	Procedure	Postop follow-up (years)
1	53/F	Left	OA	PFC-Sigma	Arthroscopic debridement and lateral release	1
2	73/F	Bilateral	OA	PFC-Sigma bilaterally	Arthroscopic debridement done bilaterally	1
3	74/M	Right	OA	PFC-Sigma	Conservative	1
4	67/M	Left	OA	Scorpio PS	Conservative	1
5	59/F	Left	OA	PFC-Sigma	Conservative	1

OA: Osteoarthritis

is 0.04% - 0.4% [4, 8, 12].

Open debridement is safe and effective procedure with no recurrences rate as compared to arthroscopic debridement of fibrous nodule. It is indicated in failure of arthroscopically treated cases and when patellar component revision is needed. Literature [4, 8, 12] shows 0% recurrence rate with open debridement.

Conservative treatment [4, 8, 12] has helped one patient who had mild patellar clunk which was diagnosed early at 3 months, the exact reason for diminishing of the symptoms over time remains unexplained. Other two patients who received this treatment continued to have same symptoms. To prove the effectiveness of this treatment it requires larger sample and long follow up. For these two patients surgery was advised. Also past results of conservative treatment were disappointing. [3, 4, 7, 9, 12]

The etiology of patellar clunk was difficult to determine because of smaller sample size. The etiology of patellar clunk is multifactorial and probably related to the design of the prosthesis, surgical trauma and component position. [11, 12]

5 CONCLUSION

Patellar clunk syndrome is one of the complications following total knee replacement, it can be prevented by avoiding patellar resurfacing.

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