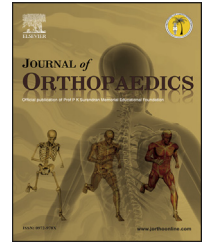


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Original Article

Effects of fat pad excision on length of the patellar tendon after total knee replacement



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ABSTRACT

Purpose: We report our results of the effect that total fat pad excision has on patellar tendon length following total knee replacement.

Method: We retrospectively reviewed radiographs of the knees of 133 patients who had DePuy LCS uncemented TKR between January 2009 to December 2009. We excluded patients who had patella resurfacing, lateral release, knee replacement for other than osteoarthritis and who had other implants used. We measured the length of the patellar tendon using the Insall-Salvati ratio. Changes in the length of the tendon were calculated both as an absolute evaluation and as a percentage of the original length.

Results: We effect of fat pad excision on patellar tendon length at 1 year and 5 years following surgery. At one year we observed no change in patellar tendon length in 81.1%, patella infera in 17.3% and patella alta in 1.6% of these 133 patients. We manage to follow up 50 of these patients at 5 years following surgery. In comparison to pre-operative length, at one year 86% showed no change, 14% had patella infera and none had patella alta. At 5 years we observed no change in 98% and patella infera in 2% of patients.

Forty nine percent of our patients with patella infera developed anterior knee pain, mean flexion in those patients was 95.625° and mean oxford score was 52.31.

Conclusions: In our patients following single implant design used patella infera developed in up to 18% at one year following surgery. Two percent of fifty patients who had five years follow up showed further shortening of patellar tendon after one year. We conclude that complete fat pad excision during total knee replacement does affect patellar tendon length.

Level of evidence IV.

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1. Introduction

Retro patellar fat pad is a mass of fibro fatty tissue located in the space between the patellar ligament and proximal tibia, it lies intra-articularly but extrasynovially. The function of retro patellar fat pad is still highly debated. It is thought to supply blood to the patella through the inferior portion of the vascular ring, which passes posterior to the patellar tendon through the fat pad. Damage to the lateral inferior genicular artery is common during fat pad excision and is thought to contribute to rendering the patella avascular.

Retro patellar fat pad excision is done in total knee replacements in order to improve access and exposure. Also some authors feel that excision of fat pad reduces incidence of anterior knee pain as the fat pad and synovial lining are sensitive to painful stimuli.

Patella infera is defined as a decrease of 10% in the length of the tendon (or as an ISR of less than 0.8). Patella infera may occur following any surgery which leads to scarification of patellar tendon which could be due to ischaemia or trauma. Theory of ischaemia is supported by Shim in his study. Shim did micro angiographic study and found numerous anastomoses between fat pad and patellar tendon.

Whether fat pad should be preserved or excised is widely debated. We retrospectively looked 133 patients radiographs and we are reporting our findings of the effect that the total fat pad excision has on length of patellar tendon.

Previous studies have given results of fat pad excision after using different implants and have also compared TKR with unicompartmental knee replacement. None of previous studies have outcome after 5 years. There are conflicting outcomes from previous studies. Some studies have shown reduction¹ but others have shown no change in patellar tendon length.²

2. Materials and methods

We retrospectively reviewed radiographs of the knees of 210 patients who had total knee replacement in our hospital between January 2009 to December 2009, 193 patients had DePuy low contact stress (LCS) uncemented total knee replacement, Seven patients were unavailable for review because of death or loss to follow-up clinical details were available for the remaining knees. **We excluded patients who had patella resurfacing, lateral release, knee replacement for other than osteoarthritis and those who had other implants used.** All our patients had patellar osteophytes removed and margins diathermised.

Out of 133 (Table 1) patients who were selected for study 56 were men and 77 were women, age range was between 42 and 90 (mean age 72.7) at the time of operation. Serial radiographs were reviewed in 133 knees at one year and 50 knees at 5 years. At 5 years follow up there were 20 men and 30 women with age range from 42 to 86 (mean age 73.1). All patients had medial Para patellar approach and fat pad was excised completely. All surgeries were performed under tourniquet and all had drain put in. Patients were operated by two senior surgeons but same technique and implants were used in all patients.

Table 1 – Details of the 133 patients.

LOPT 1 year after operation	
Total number of knees	133
Mean age at operation	72.7 (42–90)
Male	56
Female	77
Died	7
Clinical review at 5 years	50
LOPT 5 years after operation	
Clinical review at 5 years	50
Mean age at operation	73.1 (42–86)
Male	20
Female	30

All the patients were mobilised from the next day of surgery and discharged with community physiotherapy as soon as they achieve 90 degree of knee flexion and were deemed safe for discharge. Radiographic evaluations were performed pre and postoperatively, standard radiographs were taken as per protocol of radiology department by senior radiographer (AP view with film to focus distance of 100 cm from the skin and patella facing forward. Lateral radiographs were taken standing with focus to film distance of 100 cm). All patients had pre-operative and post-operative radiographs at six weeks, one year and five years.

2.1. Measurements

We measured and recorded the length of the patellar tendon on the lateral radiographs taken before and after the operation, using the Insall-Salvati ratio.³ **We also measured the diameter of femoral shaft at a point 10 cm above intercondylar fossa on each radiograph.** Measurements were done by single surgeon, paired preoperative and postoperative radiographs were evaluated simultaneously to minimise error. The same points were identified on each radiograph and measurements were made between a point on the posterior surface of patellar tendon at inferior pole of the patella to the proximal margin of tibial tuberosity.

We measured diameter of femoral shaft 10 cm above intercondylar fossa on all the films (each one separately) and did statistical analysis to ensure there was no variation in magnification between different radiographs.

In order to assess the consistency of the technique used to measure the patellar tendon, we did a repeatability study on 10 of these patients (40 X-rays). Measurements were done by same surgeon who reviewed same radiograph used the same method but at two different occasions.

Changes in the length of the tendon were calculated both as an absolute evaluation and as a percentage of the original length. Patella infera has been defined as a decrease of 10% in the length of the tendon (or as an ISR of less than 0.8)³. The same method was used as in the main study of Insall-salvati.

2.2. Statistical analysis

Statistical analysis was used to determine the effects of the fat pad excision on the length of the patellar tendon after total knee replacement, outcome after 1 year and 5 years. Linear

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