

# Patella Refashioning During TKR In Patient With Previous Bilateral Patellectomy, Using Bone Cuts

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## Citation

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## Abstract

In the past, patellectomy used to be the mainstay of treatment for multitude of patellofemoral problems including arthritis, recurrent dislocation, comminuted fracture etc. such patients are prone to early OA, and the result of a TKR can be compromised due to absence of patella. We report a patient with previous bilateral patellectomy, who underwent bilateral total knee replacement. We refashioned the patella using posterior condyle cut, and achieved a better cosmetic and functional result. We believe this technique avoids the cost and potential problems associated with patellar allograft, with a similar, if not superior functional result.

## INTRODUCTION

In the past, many a conditions of patella, including comminuted fractures, recurrent dislocations, patellofemoral arthritis etc were treated with patellectomies, as patella was just considered as another dispensable sesamoid bone<sup>(1)</sup>. With time, and increasing understanding of its role in the extensor lever arm of lower limb, however, now it is almost unheard of<sup>(2,3)</sup>. However there are still some patients, seen in the clinical practice who have had this surgery in the past, and present a challenging problem for the clinician planning any further procedure on the knee<sup>(4)</sup>.

We present a report of a lady in her late fifties who had bilateral patellectomy 3 decades ago for recurrent dislocation of patella. She had since developed severe arthritis in the knees, and needed a total knee replacement.

## CLINICAL PROBLEM

In a patient with patellectomy, the extensor lever arm is weaker; quadriceps strength decreases by 40% without patella<sup>(3)</sup>. Problems associated with patellectomy include loss of normal knee power and function, quadriceps weakness, and failure to resolve anterior knee pain (if done for patellofemoral OA). It also predisposes patients to early OA<sup>(5)</sup>.

Joshi et al found an increased complication rate of 36% in patients with patellectomy undergoing TKR, mainly AP instability and failure<sup>(6)</sup>. Generally, Posterior stabilised implants have been favoured in such patients, reportedly

causing less AP translation, and also helping with quadriceps extension by increasing lever arm<sup>(6,7,8)</sup>. However, it is still not universally accepted and subject of considerable debate.

TKA following patellectomy is associated with increased revision rates, but provides significant improvements in pain, function and motion without a clinically significant amount of extensor lag. Immobilization does not appear to improve or prevent lag but does predispose for arthrofibrosis and the need for manipulation. Therefore it is advisable to mobilise these patients as soon as practicable after operation<sup>(4)</sup>.

The traditional surgical approach for TKR involves everting the patella to keep quadriceps retracted, and in absence of patella, it has to be manually retracted all the time, with further risk of injury to the extensor mechanism.

Our patient was otherwise fit and well, and had a successful career. She had always been quite conscious of the slightly unusual appearance of her knees without the kneecap. She was thus keen to explore any opportunity to improve the cosmetic appearance while we were contemplating a knee replacement.

We used a technique to recreate patella from the bone cuts during knee replacement, thus to gain from the benefits of improved lever arm, and more efficient functioning of quadriceps. It is also cosmetically more appealing to the patient. Use of whole patellar allograft in such a situation

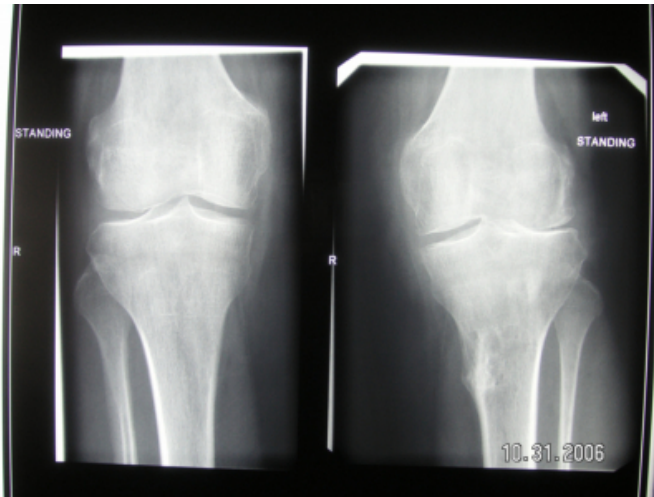
has also been reported recently with good short term results (10).

## CASE DETAILS

50 year old female, presented with bilateral OA knees (fig1, 2) following patellectomy three decades ago for recurrent dislocation.

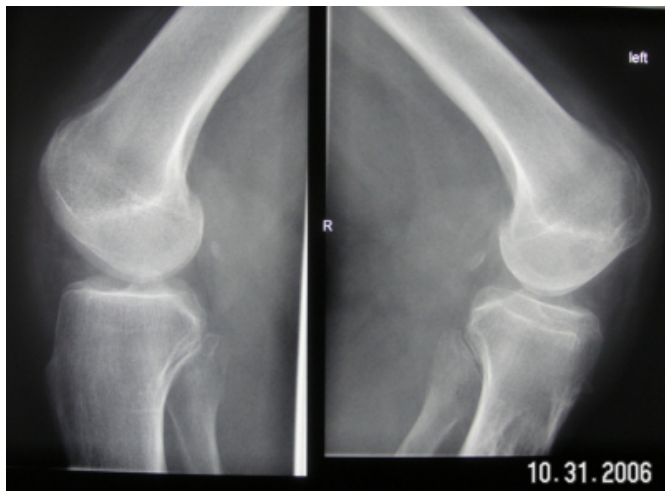
**Figure 1**

Figure 1: preop AP X –ray showing bicompartamental arthritis



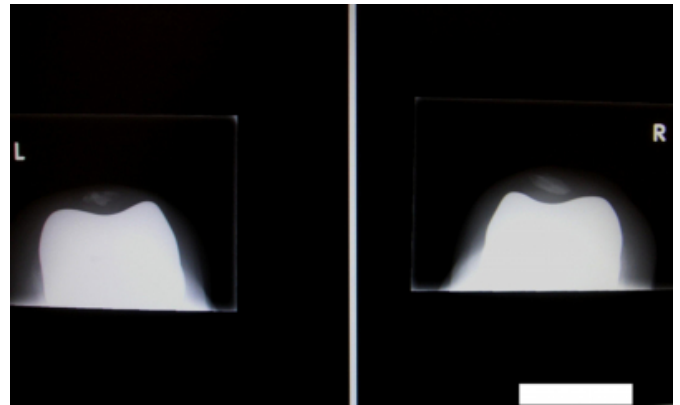
**Figure 2**

Figure 2: preop lateral x-ray



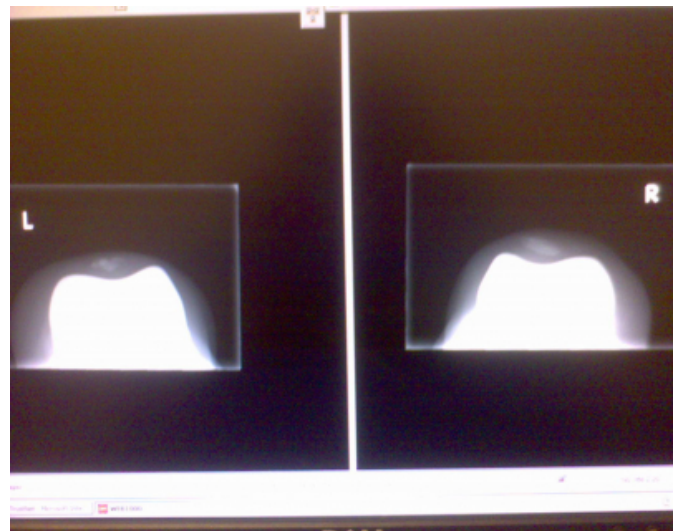
**Figure 3**

Figure 3: postop skyline views of both the knees at 1 year



**Figure 4**

Figure 4: lateral x-ray of both knees at last follow up.



She was slightly overweight and had good knee movements, including full extension and flexion up to 100 degrees. Her mobility was greatly restricted on account of pain, and the preoperative knee society score was 47. She underwent bilateral total knee replacements at 6 months interval, along with refashioning of the patella on both the sides.

## SURGICAL TECHNIQUE

Knee joint was opened using standard medial parapatellar approach and the bone cuts taken with great care. The posterior cut was preserved. After trial implantation, the quadriceps tracking was observed. The place for patella refashioning was determined by tracking, as well as small calcified and scarred tissue in the muscle that gave an indication of the previous position of patella. The posterior bone cut from medial femoral condyle was used to recreate the patella. It offers the advantage of not only a bigger size,

but also better preserved cartilage (being non weight bearing surfaces). A pouch was created in the quadriceps mechanism at the place of patella implantation, and the bone chunk was sutured in place using heavy non absorbable sutures. The patellar tracking was confirmed before closure.

## **FOLLOW UP**

Patient is now 18months postop her first knee and 12 months following the second. She is particularly pleased with the appearance of the knees, and doesn't report any problems. ROM on last follow up was 0-100. The knee society score had increased to 88. X-rays (fig3, 4) have not showed any absorption of the 'patella' so far, and it has stayed in position. She has also managed to lose weight on account of her improved mobility.

## **DISCUSSION**

Although allograft of patella is an attractive option, there is always the small risk of rejection or disease transmission. Moreover, patellar thickness has been shown to reduce by 38% at average 44 months (<sub>10</sub>). Using posterior cuts of femur as patella offers the potential advantages of improved lever arm without the possible complications of allograft. As regarding the survival of the bone, further follow-up is needed to see if she develops any long term complications, the main concern being avascular necrosis of the refashioned "patella".

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## **References**

1. Ackroyd CE, Polyzoides AJ: Patellectomy for osteoarthritis. A study of eighty-one patients followed from two to twenty-two years. J Bone Joint Surg Br 1978 Aug; 60-B(3): 353-7
2. Grelsamer RP, Weinstein CH: Applied biomechanics of the patella. Clin Orthop 2001 Aug; (389): 9-14
3. Watkins MP, Harris BA, Wender S, et al: Effect of patellectomy on the function of the quadriceps and hamstrings. J Bone Joint Surg Am 1983 Mar; 65(3): 390-5
4. Adolph V Lombardi Jr, MD, Keith R Berend, MD Ronald Mineo, Thomas H Mallory, MD Columbus; Total Knee Arthroplasty Following Patellectomy; podium presentation 2006 AAOS meeting, March 22-26, Illinois, USA.
5. Feller JA, Bartlett RJ: Patellectomy and osteoarthritis: arthroscopic findings following previous patellectomy. Knee Surg Sports Traumatol Arthrosc 1993; 1(3-4): 159-61
6. Joshi AB, Lee CM, Markovic L, et al: Total knee arthroplasty after patellectomy. J Bone Joint Surg Br 1994 Nov; 76(6): 926-9.
7. Larson-KR; Cracchiolo-A 3d; Dorey-FJ; Finerman-GA University of California, Los Angeles; Total knee arthroplasty in patients after patellectomy; Clin-Orthop. 1991 Mar(264): 243-54
8. Martin SD. Haas SB. Insall JN; Primary total knee arthroplasty after patellectomy; Journal of Bone & Joint Surgery - American Volume. 77(9):1323-30, 1995 Sep
9. Patella in TKR; Wheeless textbook of Orthopaedics.
10. Busfield T Benjamin, Ries MD: Whole Patellar allograft for Total knee Arthroplasty after previous patellectomy. CORR 2006 (due for publication in Sept 2006).

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