

## Symptomatic Patellar Maltracking and Role of Daycare Surgery

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### Abstract

### Original Research Article

Patella femoral pain is reported by a majority of patients with anterior knee discomfort attending the orthopedic clinic with varying age group distribution. The symptoms often adversely affect their activities of daily living. Often patients present later with increased symptoms with the development of patella-femoral arthritis. **Methods:** This study was conducted in the Department of Orthopedics, Prathima Medical College, Nagunoor, Karimnagar, and Telangana. The study group included patients attending orthopedic OPD with complaints of knee discomfort catching knee pain, clicks episodes of subluxation and dislocation with or without minor trauma or strain. After thorough clinical examination x-ray of both the knees standing, AP, lateral and skyline view of the patella were taken. A lateral soft tissue release using a mini-incision keyhole surgical procedure on an OPD basis was done under local anesthesia. The patients were mobilized at the end of two weeks with concomitant quadriceps strengthening exercises. The improvement in knee function was assessed postoperatively at 6 weeks, 6 months, 1 year and 1 ½ year using OKS.

**Results:** A total number of 14 patients were selected for specific planned treatment after the patella skyline view showed features of maltracking. All the patients were females. The age group varies from 16-59 years, maximum numbers were in the age group below 16 - 20 where there were n=7(50%), between 20 and 40 there were n=3 patients(21.43%) and between 40 and 60 there were n=7(28.57%). The mean OKS was 42.50 before surgery and 20.50 after surgery (range 12-45). The values were distributed normally in both preoperative and postoperative groups. The improved lower knee score in the post-operative group observed at the end of 6 weeks was retained and partly improved in the subsequent follow up at 6 months, 1 year and 1 ½ year. **Conclusion:** Clinically suspected maltracking which can be radiologically confirmed cases gave the good results with mini-incision keyhole surgery with the lateral soft tissue release in all the age groups under the study. The improved function confirmed using OKS, persisted at the end of 6 months, 1 year and 1 ½ year. Since the surgery is minimally invasive and cost effective it may serve as an alternative to Knee arthroplasty in limited resource settings.

**Keywords:** Patellar maltracking, skyline view, OKS, mini-incision keyhole.

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## INTRODUCTION

Knee pain and or stiffness affecting one or both knees are one of the important causes of orthopedic morbidity in patients of all ages from adolescent to late adulthood [1]. Some of these patients of the adolescent age group may even present with patellar subluxation or dislocation with or without trivial trauma. Careful clinical and radiological evaluations, as well as periodical, follow up where necessary may prove that patellar maltracking is the underlying cause. It is sometimes difficult to identify early and unless it progressively develops patella-femoral arthritis [2]. The problem will accentuate if episodes of subluxation or dislocation occur especially with recurrence. Clinical and radiological assessment and early detection of the underlying patellar maltracking is the key to successful functional

improvement and prevention of late patellofemoral arthritis [3]. Early intervention further facilitates the return to occupational, recreational and academic activities based on age group and workgroup, apart from physical comfort from the relief of diurnal morbidity. The numbers of patients attending a teaching hospital OPD are from low income and middle-income socio-economic groups. The symptoms often prevent them from their ADL and from academic activities in the student group. Identification of causes and correction to the possible extent taking into consideration the economic constraints of the patients could give functionally reasonably good results, more comfortable return to work and activities at the earliest possible. The treatment can be undertaken not only in a tertiary care hospital but also in a hospital with minimal resources. The implant-related complications, major

anesthetic complications, major surgery, and immobilization related complications, increased the chance of infection due to bulky implants well as comorbid conditions are all eliminated. With this background, we in the present study tried to evaluate the patients with patella maltracking corrected with mini-incision keyhole surgery with the lateral soft tissue release. The outcomes-based on OKS score both preoperatively and postoperatively.

## MATERIALS AND METHODS

This study was conducted at Prathima Medical College, Nagunoor, Karimnagar, and Telangana. Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the patients after explaining the nature of the study in their local language. The study group included patients attending orthopedic OPD with complaints of knee discomfort catching knee pain, clicks episodes of subluxation and dislocation with or without minor trauma or strain. A total number of n=14 patients were

selected for specific planned treatment after the patella skyline view showed features of maltracking. All the patients were females in the study period. The age group varying from 16 years to 59 years detailed history was taken with emphasis on symptoms, duration, and appearance of symptoms, recurrence, and persistence of symptoms, worsening or improvement if any.

Physical examination includes a range of motion (ROM) assessment, feeling of crepitus in the patellofemoral articulation, areas of tenderness, abnormality in the shape of knee, any apparent lateral displacement of patella within the femoral condylar notch, presence of any valgus or varus deformity of knee, presence of high riding patella (patella Alta), low riding patella (patella Baja), small sized patella (patella Brieva), hyperlaxity of joints. Patella of the symptomatic side was compared with opposite patella where symptoms were unilateral. After thorough clinical examination x-ray of both the knees standing, AP, lateral and skyline view of the patella were taken.



**Pre-operative skyline X-ray Projections of representative cases showing maltracking A and B Right and left knee of 47 year old female, C Right knee of 18 year female, D Right knee of 48 year female, E and F: Right and left of Bilateral Knee**

**Fig-1: Pre-operative skyline X-ray Projections of representative cases showing maltracking**

The patients who were assessed to have patellar mal-tracking after clinical and radiological were explained about this the procedure of surgical intervention, the limitations of the surgical outcome expectations.

All the patients were willing to undergo surgical intervention after the preoperative Oxford knee score (OKS) underwent the usual pre-operative evaluation for surgery. N=2 patients were diabetic and were well controlled with medication. After local preparation of the limb, under local anesthesia, 1.5-2 cms transverse incision was made at the level of the mid portion of the patella on the lateral aspect, corresponding to the area overlying lateral retinaculum. The transverse incision over the skin and subcutaneous

tissue was deepened by blunt dissection and an artery forceps was more vertically to either direction up and down to develop an interval for free incision of the deeper tissue. The soft tissue structures including the capsule can be felt like a tight structure especially when the patella is attempted to be moved medially by firm thump pressure of the opposite hand. Fine scissors can now be used to cut the deep tight retinaculum including capsule in the vertical direction up and down extending to the aponeurosis of vastus lateralis above and lateral aspect of patellar tendon below. The component tissue includes the deep fascia (fascia lata) which forms the most superficial layer, and the deepest is the joint capsule. The intermediate layer consists of derivatives of iliotibial band and quadriceps aponeurosis. Deep fascia of quadriceps tendon and deep transverse fibers

of the tendon of vastus lateralis oblique also take part in the formation of lateral retinaculum. After deep dissection, the patella along with the quadriceps muscle is pushed medially with the thumb identifying free medial movement and ensuring the free release of lateral tightness. The wound site is observed for any significant bleeding and skin and subcutaneous tissue are closed with deep bite sutures as a single layer. The dressing is applied and the wound is padded and knee immobilized provisionally with knee splint for 7 days with permission for touch-down weight bearing in extension for Activities of Daily Living (ADL). A single dose of broad-spectrum IV antibiotics is given followed by oral antibiotics of the same group for 5 more days along with NSAID and PPI. Sutures are removed at the end of 14 days and gradual movements are started to attain full ROM in another 1 week. Quadriceps strengthening exercises are also initiated. Patients were permitted to return to their works/recreation any time after 2 weeks and for studies after 1 week in the student group. The clinical improvement in symptoms reported was objectively analyzed by OKS at 6 weeks, 6 months, 1 year and 1 1/2 year.

### Description of Oxford knee score (OKS)[4]

This is 12 item self-report measure containing questions regarding patients' pain and level of functioning to assess the result of knee surgery. Originally, this item was rated on the scale of 1-5 from least to most difficult or severity. The lowest score was 12 indicating that the patient was fully functional with no complaints and the highest total score was 60 indicating maximum difficulty. There is a modified OKS scoring system which uses ranging from 0-4 on each question with 4 representing maximum function and 0 representing the poorest function [4]. Using this modified OKS, the lowest worst score is 0 and the highest best score is 48. The original OKS rating was used in this study to assess the improvement of knee function. The OKS instrument/ measure assessment areas included: Activities of daily living, Functional mobility, Gait, Life participation, Occupational performance, Pain, Quality of life, Seating, Sleep. The results were assessed at 6 weeks, 6 months, 1 year and 1 1/2 year.

### RESULTS

The age group varies from 16-59, maximum no was in the age group below 20 where there were n=7(50%), between 20 and 40 there were n=3 patients (21.43%) and between 40 and 60 there were n=7(28.57%).

**Table-1: Age wise distribution of the cases in the study**

Age Group	Number	Percentage
<20 years	7	50.00
20-40 years	3	21.43
40-60 years	4	28.57

The mean OKS where 42.50 before surgery and 20.50 after surgery (range 12-45). The values were distributed normally in both preoperative and postoperative groups. The improved lower knee score in

the post-operative group observed at the end of 6 weeks was retained and partly improved in the subsequent follow up at 6 months, 1 year and 1 1/2 year.

**Table-2: Oxford knee score chart of patients**

Age group	Pre-operative score	Post-operative score
<20years	30	18
20-40 years	46	32
40-60 years	52	40

The pre-operative OKS was 30 in the age group <20 and 18 in the postoperative group. The corresponding pre-operative score in 20-40 age groups was 46 and 32 in the postoperative group. OKS was 52 in the pre-operative group and 40 in the postoperative group in the 40-60 age groups of patients.

### DISCUSSION

Patellar maltracking is one of the causes of knee morbidity. Many cases go unnoticed in early life so that they present later with increased symptoms with the development of patella-femoral arthritis. Clinically

suspected maltracking which is radiologically confirmed gave good results with mini-incision keyhole surgery with lateral soft tissue release in all the age group under the study. The improved function was confirmed using OKS, persisted at the end of 6 months, 1 year and 1 1/2. However, the importance of the study is the fact that most of the patients with knee morbidity seek treatment for the same at a very late stage with the stage of established osteoarthritis. A study by Shi-Lu *et al.* [5] treating patellar mal-tracking with total Knee arthroplasty found Pre-operative patellar shift may be clinically relevant for identifying osteoarthritis patients. In the present study Patellar maltracking was treated in

this group of patients with limited incision keyhole surgery, releasing the lateral tight soft tissue gave gratifying results in this section of patients. Keisuke Kita *et al.* [6] Effects of medial patellofemoral ligament reconstruction on patellar tracking found that all patellar tracking after MPFL reconstruction remained intact at follow-up. However, Chondral status in the patellofemoral joint was not aggravated by MPFL reconstruction. Knee arthroplasty for knee arthritis is a major surgery with high expenditure which can't be afforded by a major portion of patients attending teaching institutions in India, as they are from middle or low socioeconomic status. Further, apart from the expensive surgery, there is a very long waiting list. Again a good number of these patients may have further co-morbidities like impaired lung function, poor cardiac reserve inadequately controlled diabetes, osteoporosis and an array of so many other conditions. A proper screening of these group of patients early enough and when maltracking is identified as the probable cause of knee morbidity, this minor surgical procedure of lateral soft tissue release done as a keyhole procedure with little post-operative morbidity can give a good functional result, permitting them to return to their occupation and activities very early without significant loss of earning days apart from being an almost zero expenditure treatment. This procedure is also a slightly modified version of so called lateral retinaculum release and this procedure is performed alone or may be done in combination with other realignment procedures [7]. This method is also used in cases of chronic lateral subluxation or dislocation where it is done in combination with realignment procedure but not done as an isolated realignment procedure. Studies have not shown any effect of the procedure on the patellofemoral contact area [8]. Since this kind of treatment is the least expensive. The treatment can be also in a hospital with minimal resources. The implant-related complications, major anesthetic complications, major surgery, and immobilization related complications, increased the chance of infection due to bulky implants well as co-morbid conditions are all eliminated.

## CONCLUSION

Within the limitations of the present study it can be concluded that clinically suspected maltracking which can be radiologically confirmed cases gave the good results with mini-incision keyhole surgery with the lateral soft tissue release in all the age groups under the study. The improved function confirmed using OKS, persisted at the end of 6months, 1 year and 1 ½ year. Since the surgery is minimally invasive and cost effective it may serve as an alternative to Knee arthroplasty in limited resource settings.

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