

## EVALUATION OF SYMPTOMATIC PATELLAR MALTRACKING AND RESULT FOLLOWING KEYHOLE SURGERY IN A LIMITED RESOURCE SETUP

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### ABSTRACT

#### BACKGROUND

Patellofemoral pain and catching are reported by a good number of patients with anterior knee discomfort attending orthopaedic OPD with varying age group distribution.<sup>1</sup> The strata of patients attending Govt. Medical College OPD are from low income and middle income socio-economic groups. The symptoms often prevent them from their regular jobs as well as domestic works in older age groups and from academic activities in student age group. Identification of causes and correction of the cause to the best possible extent within the limited resources of government institutional set up, economic constraints of the patients, could give functionally good results facilitating less symptomatic more comfortable return to work and activities in a limited span of time.

Patellar maltracking was identified clinically and confirmed radiologically in a group of such patients and limited incision key hole surgery, releasing the lateral tight soft tissue gave gratifying results in this section of patients.<sup>2,3,4,5</sup> The findings were objectively assessed and compared in the pre-operative and post-operative groups using Oxford Knee Score (OKS). The data showed significant results in the post-operative group, whereby this modality of approach and treatment could be recommended in patients with similar presentation. This achieves significance because of the zero cost, avoids the need of hospital stay, general anaesthetic procedure, costly prosthesis, sophisticated instruments, major operation theatre set up, prolonged morbidity related to surgery, long waiting list, patients' compliance, need of domestic and workplace modification.

#### MATERIALS AND METHODS

This study was conducted at Government Medical College, Kottayam, Kerala. Study group included patients attending Orthopaedic OPD with complaints of knee discomfort, catching knee pain, clicks, episodes of subluxation and dislocations with or without minor trauma or strain.<sup>6</sup> The age group varied 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. Reasons for delay in seeking medical advice were also enquired into.

#### RESULTS

The patellar maltracking is one of the several causes of knee discomfort and pain across various age groups. The maltracking of patella due to lateral soft tissue tightness was identified as the cause of morbidity in this group of patients clinically and radiologically.<sup>3,7</sup> The group of patients in the study were all females. Their functional disability was assessed using OKS before surgery. These group of patients underwent the lateral soft tissue release using a mini incision key hole surgical procedure on an OPD basis under local anaesthesia.

#### CONCLUSION

Patellar maltracking is one of the causes of knee morbidity. Some cases go unnoticed in early life so that they present later with increased symptoms with the development of patellofemoral arthritis. Clinically suspected maltracking which is radiologically confirmed gave good results with mini incision key hole surgery with 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 years with longest follow up to 5 ½ years.

#### KEYWORDS

Patellar maltracking, skyline view, oks, mini incision keyhole.

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#### BACKGROUND

Knee pain and or stiffness affecting one or both knees is one of the causes of orthopaedic morbidity in patients of all ages from adolescent to late adulthood. Some of these patients of adolescent age group may even present with patellar subluxation or dislocation with or without trivial trauma. Careful clinical and radiological evaluation as well as periodical follow up where necessary may prove that patellar maltracking is the underlying cause. It has to be identified

early and unless interfered progressive development of patellofemoral arthritis will ensue due to altered excess force acting over the lateral patellofemoral articulation.<sup>7</sup> The problem will accentuate if episodes of subluxation or dislocation occur especially with recurrence.

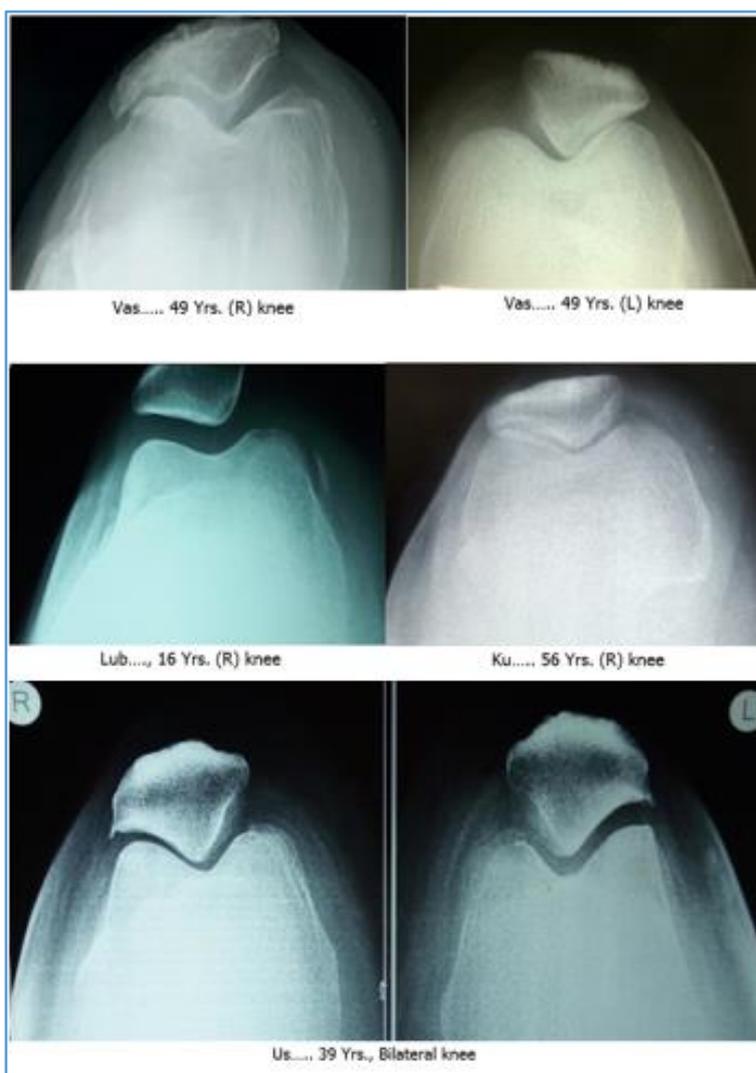
Clinical and radiological assessment and early detection of the underlying patellar maltracking is the key to successful functional improvement and prevention of late patellofemoral arthritis.<sup>2,3,4,5</sup> Early intervention further facilitates return to occupational, recreational and academic activities based on the age group and work group, apart from physical comfort from the relief of diurnal morbidity.

**MATERIALS AND METHODS**

This study was conducted at Government Medical College, Kottayam, Kerala. Study group included patients attending Orthopedic OPD with complaints of knee discomfort catching knee pain, clicks, episodes of subluxation and dislocations with or without minor trauma or strain.<sup>6</sup> The age group varied 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. Reasons for delay in seeking medical advice were also enquired into.

Physical examination included, range of motion (ROM) assessment, feeling crepitus in the patellofemoral articulation, areas of tenderness, abnormality in the shape of the 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 braeva), hyperlaxity of joints. Patella of 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. A total number of 14 patients were selected for specific planned treatment after the patellar skyline view showed features of maltracking. All the patients were females. The age group varied from 16 to 60, maximum number was in the age group below 20 where there were seven (50%); between 20 & 40 there were three patients (21.43%) and between 40 & 60 there were 4 patients (28.57%). The study period was from July 2013 to January 2018. Last patient in the group was followed up from July 2016. Longest duration of follow up in this group was for 5½ years and shortest follow up was for 1½ years.



**Figure 1. Pre-operative skyline X-ray Projections of Representative Cases Showing Maltracking**

The symptomatic patients who were assessed to have patellar maltracking after clinical and radiological assessment were explained about this trial of surgical intervention, explaining the limitations of the surgical outcome expectations.

Age group	Number	Percentage
< 20 Years	7	50.00
20 - 40 Yrs.	3	21.43
40-60 Yrs.	4	28.57

**Table 1**

All the patients who were willing for surgical intervention, after the pre-operative Oxford Knee Score (OKS) evaluation, underwent the usual pre-operative evaluation for surgery. Two patients were diabetic and were well controlled with medications. After local preparation of the limb, under local anaesthesia, 1.5-2 cm transverse incision was made at the level of mid portion of 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 moved 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 as a tight structure especially when the patella is attempted to be moved medially by firm thump pressure of opposite hand. A fine scissors can now be used to cut the deep tight retinaculum including capsule in 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 fibres of tendon of vastus lateralis oblique also take part in the formation of lateral retinaculum. The incision is not restricted to the superior and inferior limits of the patellar level but more liberally extends up as well as down. After the deep dissection, the patella along the quadriceps muscle is pushed medially with the thump, identifying free medial movement and ensuring release of the 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. Dressings are applied, and wound is padded and knee immobilized provisionally with a knee splint for seven days with permission for touch-down weight bearing in extension for activities of daily living (ADL). Single dose of broad spectrum IV antibiotic is given statum followed by oral antibiotic of the same group for five 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 one week. Quadriceps (Q) strengthening exercises are also initiated. Patients were permitted to return to their works/recreation any time after two weeks and for studies after one week in the student group. The clinical improvement in symptoms reported was objectively

analysed by OKS at six weeks, six months, one year and 1 ½ year.

#### *Description of the Oxford Knee Score (OKS)*

This is 12 item self-report measure containing questions regarding patient's pain and level of function to assess result of knee surgery. Originally, these items were rated on a 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 score ranging from 0-4 on each question with '4' representing maximum function and '0' representing poorest function. Using this modified OKS, the lowest worst score is 0 and 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 ½ year.

The mean OKS were 42.50 before surgery and 20.50 after surgery (range 12-45). The values were distributed normally in both pre-operative and post-operative 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 years.

## **RESULTS**

#### *The following observations were made-*

The patellar maltracking is one of the several causes of knee discomfort and pain across various age groups. The maltracking of patella due to lateral soft tissue tightness was identified as the cause of morbidity in this group of patients clinically and radiologically.<sup>3,7</sup> The group of patients in the study were all females. Their functional disability was assessed using OKS before surgery. These group of patients underwent the lateral soft tissue release using a mini incision key hole surgical procedure on an OPD basis under local anaesthesia. The patients were mobilized at the end of 2 weeks with concomitant quadriceps strengthening exercise. The improvement in knee function was assessed post operatively at 6weeks, 6 months 1 year and 1 ½ years using OKS. There was significant symptomatic improvement in this group of patients as assessed by OKS with a definite lowering of OKS values from pre-operative to post-operative period which was retained in the serial follow up upto 1 ½ years and more.

*Oxford Knee Score Chart of patients-*

Age group	Pre-operative Score	Post-operative Score
< 20 Years	30	18
20 – 40 Years	46	32
40-60 Years	52	40
<b>Table 2</b>		

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

### CONCLUSION

Patellar maltracking is one of the causes of knee morbidity. Some cases go unnoticed in early life so that they present later with increased symptoms with the development of patellofemoral arthritis. Clinically suspected maltracking which is radiologically confirmed gave good results with mini incision key hole surgery with 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 years with longest follow up to 5 ½ years.

The study group is rather small. However, the importance of the study is in 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 portion of these patients are affected by patellofemoral arthritis. In a sub group of these patients the underlying cause will be patellar maltracking. Knee arthroplasty for knee arthritis is a major surgery with high expenditure which cannot be afforded by a major portion of patients attending Government tertiary health institutions in India as they are from middle or low socio-economic strata. Further, knee arthroplasty apart from being expensive surgery, there is a very long waiting list for the same. Again, a good number of these patients may have other 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 key hole 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.

### Limitations of the Study

The study group and study period are comparatively small, but can be justified when considering the filtered portion of the whole patients who were approaching the physician who conducted the study.

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