

## TO EVALUATE THE OUTCOME FOLLOWING PROXIMAL REALIGNMENT PROCEDURE FOR HABITUAL PATELLAR DISLOCATION: AN ANALYTICAL STUDY.

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### Abstract

**Aim:** to evaluate outcome following proximal realignment procedure in habitual patellar dislocation.

**Materials and Methods:** prospective comparative study was conducted in the Department of Orthopedics Jawaharlal Nehru Medical College, Bhagalpur from Jan 2019 to December 2019 among 18 patients who underwent proximal realignment for habitual patellar dislocation with a minimum follow up of 6 months and a maximum follow up of 2 years. Radiological assessment was done by measuring sulcus angle and congruence angle and pain was assessed using VAS scale.

**Results:** mean age of the study population was 18.64 years and 55.6% were male and 44.4 were female. Mean pre and post operative sulcus angle (132.46, 132.58) and Congruence angle (62.86, 17.81). Two the cases showed recurrence.

**Conclusion:** we conclude that following proximal realignment procedure for habitual dislocation of patella radiological parameters were brought back to normal. There were no significant changes in sulcus angle.

**Keywords:** patella, habitual dislocation, outcome, proximal realignment

### Introduction

Habitual patellar dislocation is a rare condition where the patella dislocates during flexion and relocates during extension unlike chronic patellar dislocation that occurs during both flexion and extension of the knee, and it usually presents without pain or swelling. The incidence of patella dislocation ranges from 6 per 100,000 in the adult population to 43 per 100,000 in the pediatric population.

The etiology of habitual patellar dislocation include contracture and fibrosis of the quadriceps femoris, vastus lateralis, and lateral retinaculum, abnormal iliotibial band attachment, repeated intramuscular injections into the thigh, genu valgum, patella alta due to the abnormal position of an elongated patellar tendon, systemic ligament laxity and dysplastic lateral femoral condyle.<sup>1</sup>

A variety of surgical techniques have been introduced for the treatment of habitual dislocation of the patella with genu valgum. Among them, osteotomy combined with proximal soft tissue realignment procedures including lateral release and medial reefing has been commonly performed. It has been known that significant treatment results can be obtained with combined procedures, not with a single procedure.

Patella alta is a major predisposing factor to patellar instability.<sup>2-4</sup> Surgical treatment of habitual dislocation of the patella aims at a step-by-step correction of the predisposing abnormalities of the extensor mechanism including patella alta.<sup>5,6</sup> It has been stated that one of the

most common technical errors in distal re-alignment procedures is the failure to correct patellar height.<sup>7-9</sup>

Campbell developed the Campbell's technique as a method of proximal realignment for habitual patellar dislocation. Hence the present study was to evaluate outcome following proximal realignment procedure in patients with habitual patellar dislocation.

### Materials and Methods

#### Study Design

The present prospective comparative study was conducted in the Department of Orthopedics Jawaharlal Nehru Medical College, Bhagalpur from Jan 2019 to December 2019 among 18 patients who underwent proximal realignment for habitual patellar dislocation.

The study protocol was reviewed by the Ethical Committee of the Hospital and granted ethical clearance. After explaining the purpose and details of the study, a written informed consent was obtained.

#### Inclusion criteria

- Patients 10-30 years of age
- Patients with habitual patellar dislocation
- Patient who signed the "informed consent" form

#### Exclusion criteria

- Patients below 10 years and above 30 years of age
- Patients with past history of knee surgery
- Patients who were unfit for surgery

### Surgical technique

A midline skin incision was made from the quadriceps tendon to the tibial tubercle. Deep tissue dissection was extended from quadriceps tendon to tibial tubercle. A lateral retinacular release was then performed. 10x2cm wide was then developed. This is followed by closure of the medial arthrotomy. The proximally based strip of medial capsule is then passed over the quadriceps tendon at the superior pole of the patella from a medial to lateral direction. The flap then passed medially under the quadriceps tendon and sutured to the fascia in the region of the adductor magnus tendon. The wound was then closed in a routine fashion over hemovac drain. Postoperatively, the knee is immobilized for four weeks in the cast with knee in 30 degree flexion and then rehabilitated.

### Outcome assessment

Cast is opened on 12 day and suture removal will be done, and cast is reapplied with knee in 30 flexions, with well padding at pressure points. They were asked to review after 1 month. Patients were evaluated clinically for wound status, range of motion, patellar tracking, deformity correction, ligament laxity and neurological status. Radiological assessment is done by measuring sulcus angle and congruence angle. VAS was used to assess the pre and post operative pain.

### Statistical Analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages. The statistical test applied for the analysis was paired t-test. The confidence interval and p-value were set at 95% and  $\leq 0.05$  respectively.

### Results:

**Table 1:** demographic profile

Variables	
Age (Years)	18.64 $\pm$ 3.71
Gender	10 (55.6) /8 (44.4)

**Table 2:** Radiological outcome

Radiographic outcome	Mean $\pm$ SD	
	Pre-operative	Post- operative
Sulcus Angle	132.46 $\pm$ 7.31	132.58 $\pm$ 7.01
p-value	>0.05 (NS)	
Congruence Angle	62.86 $\pm$ 5.01	17.81 $\pm$ 4.72
p-value	<0.05 (Sig.)	

Test applied: paired t-test.

**Table 3:** VAS score pre and post operatively

VAS	Mean $\pm$ SD	
	Pre-operative	Post- operative
	6.16 $\pm$ 1.31	3.01 $\pm$ 1.01
p-value	<0.05 (Sig.)	

Test applied: paired t-test.

**Table 4:** recurrence of dislocation

Recurrence	N (%)
Present	2 (11.1)
Absent	16 (88.9)

### Discussion

Hnevkovsky et al.<sup>10</sup> attributed habitual patellar dislocation to contracture of the quadriceps femoris and introduced a technique to lengthen the muscle with the use of a lateral retinacular release and quadricepsplasty, which did not bring about complete flexion in their patients. In our patient, genu valgum and lateral femoral condyle hypoplasia following a growth plate fracture were thought as the cause of the dislocation. A quadricepsplasty was considered unnecessary because he had no contracture of the quadriceps femoris. However, lateral retinacular release alone was not sufficient to achieve joint reduction.

There were no statistically significant changes in sulcus angle as trochleoplasty procedure was not done and there was inadequate study time to notice bony changes in growing patients. In our study preoperative and postoperative range of motion was unchanged.

Radiological assessment showed statistically significant changes in congruence angle. Sulcus angle almost remained unchanged on X-rays and but it doesn't always correlate with poor functional outcome. This was found in similarity with study conducted by Benoit B et al.<sup>11</sup> in which they evaluated the long-term results of a surgical procedure performed on growing children with patellar dislocation and followed into adulthood with a follow-up period of almost 14 years. In their study no functional outcome was reported, but their reported sulcus angle was not modified.

Of two cases that had recurrence, one was revised with modified Galeazzi's technique and other patient was revised with trochleoplasty and modified Roux Goldthwait procedure.

### Conclusion

Thus we conclude that Campbell procedure is a safe and effective procedure for treating habitual patellar dislocation. Future study to quantify a medial laxity (amount of medial soft tissue to be imbricated and/or additional dynamic stabilization procedure) is desirable. Further no single procedure is fully effective in the surgical treatment of all cases of lateral patella dislocation.

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