

Habitual Dislocation of the Patella Managed by a Two-in-One Procedure

Ravi Mittal¹, M L V Sai Krishna²

Abstract

Introduction: Habitual dislocation of the patella is a complex pathological condition of the patella which is characterized by lateral dislocation of the patella with flexion and relocation of the same with extension of the knee. There are numerous surgical procedures with various modifications that have been described in the literature based on the origin of pathology (soft tissue or bone). In this case series of 15 children, we described our technique of two-in-one procedure.

Materials and Methods: We included 15 patients with habitual dislocation of the patella between the ages of 5 and 9 years. In all the patients a detailed evaluation was done preoperatively and all of them were managed by a two-in-one procedure and followed up at 3 months and 1 year.

Results: There was no recurrence of dislocation in any of the patients and all the patients had attained their full range of movement by 1 year.

Conclusion: The two-in-one procedure is a simple and reproducible procedure for the treatment of habitual dislocation of the patella without any bony involvement. The procedure included graded lateral soft-tissue release and the Roux Goldthwait procedure. The amount of lateral soft-tissue release required is titrated intraoperatively.

Keywords: Habitual dislocation, patella, two in procedure, knee.

Introduction

Habitual dislocation of the patella is a complex pathological condition of the patella which is characterized by lateral dislocation of the patella with flexion and relocation of the same with extension of the knee. It is routinely noticed when the child starts walking and is often not painful. The treatment is dependent on the predisposing factor for the dislocation ranging from bony correction to soft-tissue procedures [1, 2]. Mostly a combination of procedures is performed, of which the four-in-one procedure by Joo et al. [3] is the most common. In our patients, we performed a modification of the four-in-one procedure wherein a graded lateral release and medial transposition of the lateral half of the patellar tendon as described by Roux Goldthwait [4] was done.

Materials and Methods

Fifteen children with habitual patellar dislocation were included

in this study. All the children were skeletally immature and had an open physis at presentation. Patients with congenital dislocations, bony abnormalities (torsional abnormalities and genu valgum) children with recurrent dislocations, and any previously operated knees were not included. All the children were evaluated clinically and radiologically. They were evaluated clinically for torsional deformities by Craig's test for anteversion and thigh foot axis for tibial torsion. They were evaluated for coronal plane deformity as well. The radiological evaluation consisted of anteroposterior, lateral, and skyline views of the knee. All the children were evaluated for generalized ligamentous laxity as well and after pre-anesthesia evaluation were planned for surgery and evaluated postoperatively at 3–12 months. A statement of informed consent has been obtained from the families of all the children for publishing their case history details and pictures without the identification details.

Surgical technique

All the children underwent surgery by a senior author under anesthesia. The children were placed supine and the procedure was carried out under general anesthesia. No tourniquet was applied. The skin incision was in the midline and extended from the middle of the thigh to the tibial tuberosity. The subcutaneous tissue was raised as thick medial and lateral flaps.

¹Department of Orthopaedics, All India Institute of Medical Sciences, New Delhi, India,

²Department of Orthopaedics, Aayush Hospitals, Eluru, Andhra Pradesh, India

Address of Correspondence

Dr. M L V Sai Krishna,

Department of Orthopaedics, Aayush Hospitals, Eluru, Andhra Pradesh, India.

E-mail: krishna.mlv.sai@gmail.com

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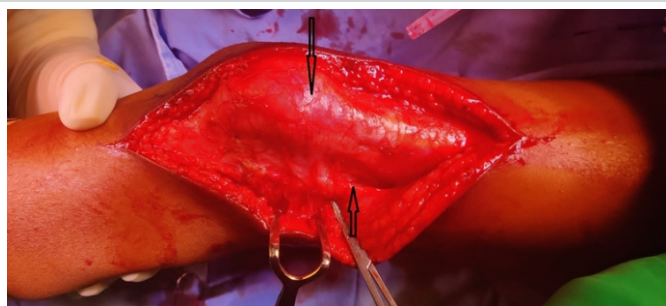


Figure 1: Vastus lateralis and iliotibial band (marked superiorly and inferiorly respectively).

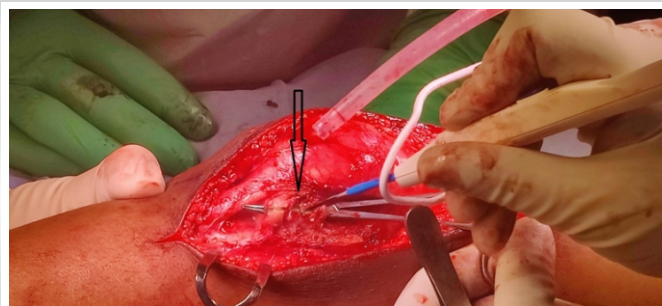


Figure 2: Tight lateral fibrotic bands (marked).



Figure 3: The patella tendon was split in the middle and the lateral half of the patellar tendon was transposed under the medial half to be sutured to the periosteum and pes anserinus tendon insertion.

Later vastus lateralis and iliotibial band were identified (Fig. 1).

This was followed by the elevation of vastus lateralis from the lateral intermuscular septum and the anterolateral surface of the femur up to the mid-thigh. Any tight lateral fibrotic bands (Fig. 2) between the iliotibial band and the lateral patella were identified and transected.

The lateral retinaculum was released up to the tibial tuberosity. The patella tendon was split in the middle and the lateral half of the patellar tendon was transposed and sutured under the medial half to the periosteum and pes anserinus tendon insertion (Fig. 3). Later the two halves of the tendon were sutured together.

The distal tendinous portion was fractionally lengthened by a series of partial transverse incisions (Fig. 4).

After each step, the patella tracking and knee range of movement were evaluated. The incision was closed in 100–120° flexion by placing the patella in the trochlear groove. Only the skin and subcutaneous tissues were closed leaving the deeper structures. A plaster of Paris was applied in the same flexion for 2 weeks (Fig. 5). After 2 weeks the plaster was removed and gentle active and active assisted knee range of movement exercises were started. In the following week once full extension was achieved full weight bearing was started along with quadriceps strengthening exercises.

Results

Our study included a total of 15 children

Table 1: Details of the patients

Patient	Age (years)	Sex	Knee ROM		
			Preoperative	3 months	12 months
1	5	M	0–140	5–140	0–140
2	9	F	0–120	0–130	0–140
3	6	M	0–140	0–130	0–140
4	5	M	0–140	0–120	0–130
5	8	M	0–130	0–140	0–140
6	8	F	0–140	0–140	0–140
7	6	M	0–140	0–140	0–140
8	7	M	0–130	0–120	0–140
9	9	M	0–140	0–140	0–140
10	6	M	0–130	0–120	0–140
11	7	M	0–140	0–140	0–140
12	6	F	0–140	0–140	0–140
13	8	M	0–130	0–130	0–130
14	9	M	0–140	0–140	0–140
15	7	F	0–140	0–140	0–140

ROM: Range of motion, M: Male, F: Female

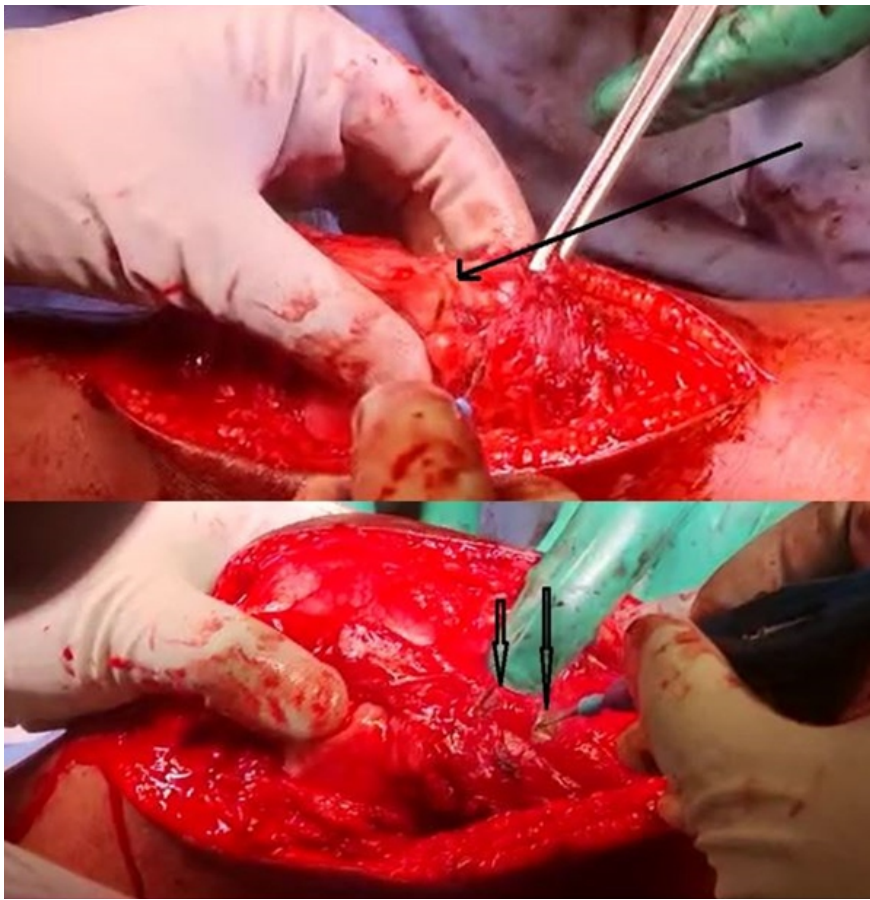


Figure 4: The distal tendinous portion was fractionally lengthened by a series of partial transverse incisions (marked).

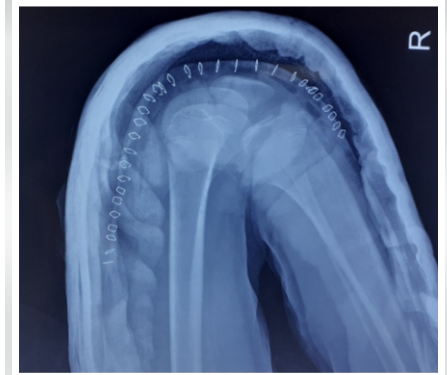


Figure 5: Post-operative X-ray.

pathology. The bony pathology includes increased femoral anteversion and tibial extorsion which together constitute a miserable malalignment. The other bony causes for habitual dislocation include genu valgum, patella alta, and trochlear dysplasia [1, 2]. The soft-tissue pathology responsible includes medial laxity and lateral soft-tissue contractures. The lateral soft-tissue pathology in habitual dislocation includes tight lateral retinaculum, fascial bands, and short quadriceps muscles and along with this degeneration and fibrosis were also demonstrated in the vastus lateralis [5-7].

In our patients, we noticed tight fibrotic bands extending from the lateral margin of

who were followed up for 1 year (Table 1). There were 11 boys and four girls. The age ranged from 5 to 9 years. In five children, right knees were affected and in the rest left knees were affected. The average duration of surgery was 60 min and the hospital stay was 3 days from admission to discharge. All the children had an anterior knee slab for 2 weeks and the radiographs demonstrated patella in the center of the trochlea. In all the children suture removal was done at 10 days plaster removal at 2 weeks and a range of movement exercises was started. The patients were followed up at 3 months and 1 year. There were neither any post-operative complications nor any recurrences in any of the children. All the children were able to perform active straight leg raising tests by 3 months and attained full range of movement. In our case series, we have had no recurrences or revisits from any of the children after 1 year.

Discussion

Habitual dislocation differs from recurrent dislocation of the patella in that the latter is mostly painful and associated with apprehension. Recurrent patellar dislocation is mostly characterized by loss of medial stabilization. Habitual dislocation of the patella can occur due to bony or soft-tissue

the patella to the iliotibial band. There was no trochlear dysplasia in our patient. A four-in-one procedure was described by Joo et al. which included proximal tube realignment, semitendinosus tenodesis, lateral release, and patella tendon transfer [3]. This procedure demonstrated satisfactory results by Niedzielski et al. [8]. Gao et al. demonstrated satisfactory results with the lateral release, medial placcation, and transfer of the patella tendon in a three-in-one procedure. [6] In our study, we have used a two-in-one procedure as described by Mittal et al. [9] which included the Roux Goldthwait procedure and graded lateral release. Roux Goldthwaite's procedure results in the distal realignment of the extensor mechanism due to the transfer of the lateral half of the patellar tendon under the medial half [9]. In our study, we modified the same as described by Mittal et al. [9] by suturing the transferred lateral half of the patellar tendon under the medial half to the periosteum of the medial tibia and pes anserinus tendons and as well suturing both halves of tendons together which avoids patella dislocation and titling. We were able to achieve the centering of the patella in the trochlear with two in one procedure as described by Mittal et al.

Conclusion

In our study, we were able to address habitual dislocation of the patella with the Goldthwait Roux procedure and a graded lateral release. The amount of lateral release can be decided intraoperatively which extends from removal of tight fibrous bands to fractional lengthening of vastus lateralis.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of Interest: NIL; **Source of Support:** NIL

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