

The Quasi Anatomical Plication of the Medial Retinaculum. A Technical Note

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First-time patellar dislocation is a common knee injury, particularly among adolescents and young adults. Treatment remains controversial, with the choice between conservative and surgical management best guided by patient-specific factors. For patients with acute, first-time patellar dislocation and concomitant chondral lesions requiring surgical management, minor soft-tissue stabilization procedures may be considered. This technical note describes an arthroscopically assisted, quasi-anatomical medial retinacular plication technique. The procedure involves the introduction of looped polydioxanone sutures (PDS) through 18-gauge needles positioned along the medial patellofemoral ligament (MPFL) trajectory, with knot tying performed extra-articularly. The maneuver can be repeated multiple times, allowing stepwise medial retinacular tightening.

Keywords: Plication; Medial retinaculum; MPFL; Medial patellofemoral ligament; Patellar dislocation; Patellar instability; Arthroscopy; Knee

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Introduction

The MPFL is a thin ligament with a sailboat shape, with a relatively wide footprint between the medial femoral epicondyle and the adductor tubercle, attaching to the proximal two-thirds of the medial patellar border [1][2] and the femoral prominence between the medial epicondyle and adductor magnus tendon. First-time patellar dislocation (FTPD) is associated with disruption of the medial patellofemoral ligament (MPFL), which is torn in over 90% of cases [1][2]. Lateral patellar dislocation accounts for approximately 3% of all knee injuries, with an annual incidence of 5–6 per 100,000 individuals, most frequently affecting adolescents and young adults [3][4]. While nonoperative management has traditionally been favored, recurrence rates remain significant, particularly in the presence of anatomical risk factors such as trochlear dysplasia, patella alta, and excessive Q angle [4][5]. The role of surgery after FTPD remains controversial. Soft tissue surgical treatment options for patella instability may include MPFL repair, MPFL reconstruction, or medial retinaculum plication and lateral release. There is general expert consensus that isolated lateral retinacular release is not indicated for the management of patellofemoral instability. Rather, it is regarded as an adjunctive procedure, reserved for

cases with demonstrable lateral retinacular tightness contributing to maltracking or instability [6]. MPFL reconstruction compared to MPFL repair indicated lower rate of patella dislocation recurrence and better clinical outcomes and return-to-sport results [10][11]. Diagnostic evaluation should include plain radiographs (anteroposterior, lateral, and axial views) and MRI, which helps identify osteochondral injuries and assess MPFL integrity [12][13]. The European Society of Sports Traumatology, Knee Surgery, and Arthroscopy (ESSKA) consensus recommends conservative treatment in low-risk patients without chondral injury, reserving surgical intervention for cases with significant cartilage damage or high recurrence risk [14][15].

To achieve the biggest possible degree of knee preservation chondral lesions should be repaired in case they exceed >1cm³ or removed (microfractures technique). In patients with FTPD with concomitant chondral lesions and risk factors that would lead to patella instability should be informed that there are two options in surgical management. The permanent solution consists of treating chondral lesions and patella instability in one stage (repairing chondral lesions bony procedures, with/without MPFL reconstruction). The second option addresses mainly chondral lesions and the patella instability is managed with minor soft tissue surgery (plication). For patients with FTPD without risk factors MPFL

reconstruction may be too invasive, potentially causing donor site complications, requiring larger skin incisions. While medial plication has generally demonstrated limited efficacy in the treatment of patellar instability [16][17], it should not be entirely disregarded. In selected cases, particularly when patellar osteochondral fractures necessitate arthroscopic management, medial plication may serve as a valuable adjunct [18]. Therefore, it remains a potential option for individualized treatment strategies following patellar dislocation [19]. This article describes a modification of medial capsular plication, in which the procedure is performed at the anatomical landmarks of the medial patellofemoral ligament (MPFL). The technique aims to restore medial soft-tissue tension in a more anatomical manner compared with traditional plication methods. This approach may provide improved stability in selected cases of patellar instability, while remaining technically straightforward and reproducible.

Methods

Patient Positioning and Preparation

Following the administration of appropriate anesthesia, the patient is placed supine with a thigh tourniquet. The patellar glide test is performed bilaterally for reference. The medial patellofemoral ligament (MPFL) trajectory is outlined from the medial patellar border to the medial femoral epicondylar region [1][2]. (Figure 1).

Diagnostic Arthroscopy

A standard anterolateral and anteromedial portal are created. Arthroscopy is performed to identify and remove loose bodies and to address concomitant chondral pathology as indicated [12][13].

Surgical Technique

1. Using an 18-gauge needle, the medial retinaculum is punctured adjacent to the marked MPFL trajectory (Figure 2A).
2. A looped polydioxanone suture (PDS) is passed through the first needle.
3. A second needle, loaded with PDS, is introduced approximately 1 cm away on the opposite side of the MPFL trajectory [20][21] (Figure 2B).
4. The free end of the second suture is passed through the initial loop and retrieved arthroscopically (Figure 2C, 2D and 2E).
5. The maneuver may be repeated three to four times until the desired degree of medial retinacular tightening is

achieved (Figure 3).

6. The knot is tied extra-articularly on the medial side of the retinaculum [22]. (Figure 2F and Figure 4).

The technique is presented step by step in a **Supplementary Video**.

Inclusion Criteria

- First-time patellar dislocation with concomitant chondral lesion requiring surgical management.
- Clinical or arthroscopic evidence of patellar instability without severe predisposing risk factors.

Exclusion Criteria

- Chronic or recurrent patellar instability.
- Trochlear dysplasia grade II–IV.
- Patella alta or excessive Q angle.
- Generalized ligamentous laxity [4][5].

Technical Considerations

Care should be taken to avoid entrapment of the infrapatellar branch of the saphenous nerve during suture passage. Knot tying is performed extra-articularly, reducing intra-articular suture load [22].

Discussion

Medial retinaculum plication techniques have been in practice since 1986 [24]. The described quasi-anatomical medial retinacular plication offers a minimally invasive alternative for stabilizing first-time patellar dislocation in the presence of chondral lesions. This technique is similar to other needle-assisted arthroscopic plications [7][8][9][21][23] but differs in its repeatable, stepwise tightening along the MPFL course, providing a quasi-anatomical construct. Its advantages include minimal invasiveness and the ability to perform it in the same setting as arthroscopic treatment of chondral lesions. Unlike MPFL reconstruction, which is considered the gold standard soft tissue procedure in patients at high risk of recurrence [10][11][14][15], plication does not restore the native biomechanics of the ligament and is not suitable in the presence of significant anatomical abnormalities. Therefore, careful patient selection is critical. Contraindications include trochlear dysplasia, patella alta, and increased Q angle, which predispose to recurrence [4][5]. However, several limitations must be acknowledged. First, clinical outcomes for this technique remain scarce, and long-term recurrence rates are unknown. Second, it should not be

considered a replacement for MPFL reconstruction in high-risk patients, as consensus statements continue to recommend reconstruction in such settings [14][15]. Finally, technical pitfalls include the potential for inadequate tensioning or inadvertent injury to nearby infrapatellar branch of the saphenous nerve. Further clinical studies with standardized outcome reporting are required to define the role of this technique in the management algorithm of first-time patellar dislocation.

Conclusion

Quasi-anatomical medial retinacular plication is a simple, minimally invasive technique that may provide additional medial stabilization in patients with first-time patellar dislocation and concomitant chondral lesions. The technique is performed along the MPFL trajectory, offering an anatomical soft-tissue alternative to more invasive procedures. Careful patient selection remains essential, and further clinical studies are required to define long-term outcomes.

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Funding Statement

None

Conflict of Interest Statement

None

Ethical Approval

According to institutional policy, ethical approval was not required. The patient provided written informed consent for publication.



Figure 1. The trajectory of the medial patellofemoral ligament (MPFL) is marked from the medial patellar border to the femoral epicondylar region, providing anatomical orientation for the planned plication.

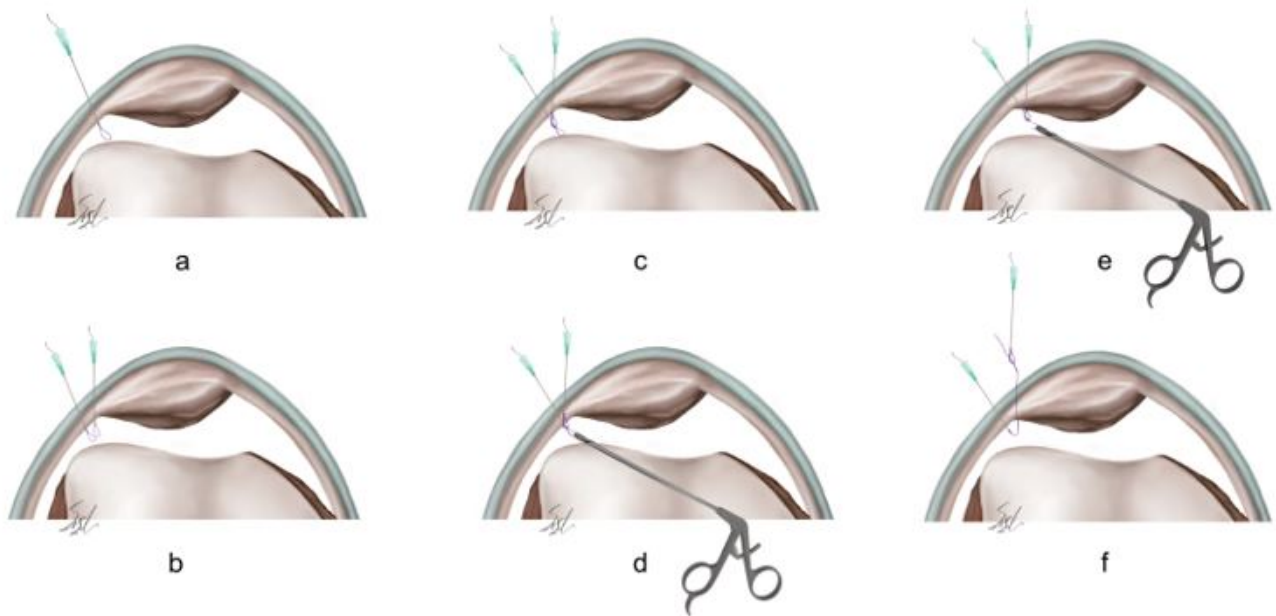


Figure 2. Stepwise plication technique: two 18-gauge needles are introduced on either side of the MPFL trajectory to pass looped polydioxanone sutures (PDS). A grasper retrieves the loop, enabling extra-articular knot tying.

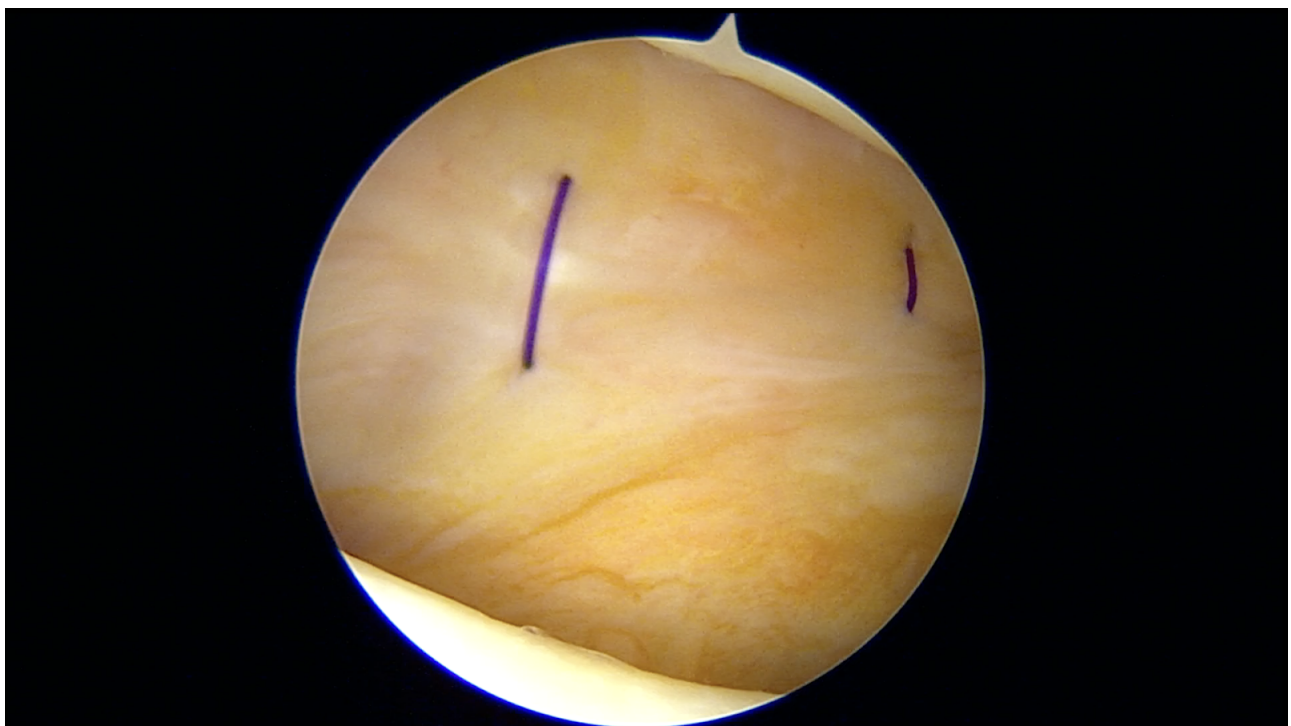


Figure 3. Final suture placement: two of three sutures are shown, oriented vertically across the MPFL trajectory, demonstrating the quasi-anatomical construct.



Figure 4 Completed construct with three sutures aligned perpendicular to the MPFL trajectory before final extra-articular knot tying.

Table 1. Indications and contraindications.

Indications	Contraindications
1st Time patella dislocation with chondral lesion	Chronic or recurrent lateral patella dislocation
	Excessive Q angle Femoral trochlear dysplasia II or IVPatella alta

Table 2. Pearls and Pitfalls.

Pearls	Pitfalls
Nicky's knot (shoulder arthroscopic surgery) can be used (14)	When the suture is fished with the probe the infrapatellar band of the saphenous nerve should not be trapped
Arthroscopic lateral release	

Table 3. Advantages and Disadvantages.

Advantages	Disadvantages
The knot is tied extraarticularly	Recurrence of patella dislocation
One suture is used The path of the plication is predetermined	

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