

Obligatory Patella Dislocation with Severe Valgus Knee Deformity Treated with Neutral-Wedge Distal Femoral Osteotomy (DFO) And Medial Patello-Femoral Ligament (MPFL) Reconstruction

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ABSTRACT

A 19 years old male patient has a chief complaint in the right knee that was worsening for about 2 years accompanied with obligatory dislocation of the patella and genu valgus deformity of the right leg. Obligatory dislocation of the patella is a condition where the patella dislocates completely with each flexion and extension cycle of the knee and the patient has no control over the patella that dislocates. Medial Patello-Femoral Ligament (MPFL) injury is the main cause of this condition and often associated with genu valgus. Several surgery methods are combined to reconstruct this condition. The most common methods used are MPFL reconstruction with DFOs as realignment procedures for knee valgus deformity. In this patient, we performed Neutral-Wedge Distal Femoral Osteotomy as a choice to realign the genu valgus of the right knee followed with MPFL reconstruction. Although patient in this case showed improvement after 90 days of procedure and physiotherapy, the general outcome of Neutral-Wedge Distal Femoral Osteotomy remains unconfirmed as insufficient studies exist about the method. Encouragement of this procedure in the future to gain more result is important for the interest of comparing and contrasting the data.

KEYWORDS

Patella dislocation; DFO; Neutral-Wedge; MPFL

INTRODUCTION

Obligatory patellar dislocation is a rare but disabling condition characterized by the complete and recurrent displacement of the patella during every cycle of knee flexion and extension, without voluntary control by the patient (Eiler, 2001). This phenomenon typically manifests in adolescents and young adults and is frequently associated with underlying anatomical or biomechanical abnormalities rather than acute trauma. The etiology is multifactorial, including aberrant femoral or tibial torsion, malalignment of the extensor mechanism, and soft tissue imbalance, with genu valgum being one of the most significant contributing factors (Ries, 2015; Bergman N, 1988). Such malalignment alters the patellofemoral joint biomechanics, increasing lateralizing forces that predispose the patella to chronic instability and habitual dislocation.

The management of obligatory patellar dislocation is complex, requiring careful assessment of both osseous and soft tissue components. While soft tissue procedures such as lateral release or medial patellofemoral ligament (MPFL) reconstruction can restore stability, failure to correct the underlying valgus deformity often results in recurrence or suboptimal outcomes. Distal femoral osteotomy (DFO), particularly the neutral-wedge type, provides an effective approach to realign the mechanical axis, thereby reducing the pathological lateral vector on the patella and re-establishing proper knee kinematics.

In this case, we report a patient with severe valgus knee deformity and obligatory patellar dislocation treated with a neutral-wedge DFO followed by MPFL reconstruction. This combined surgical approach aimed to correct the bony deformity, restore patellar tracking, and achieve long-term joint stability. The present report highlights the rationale, surgical strategy, and early functional outcomes of this integrated treatment modality for complex patellofemoral instability associated with valgus malalignment.

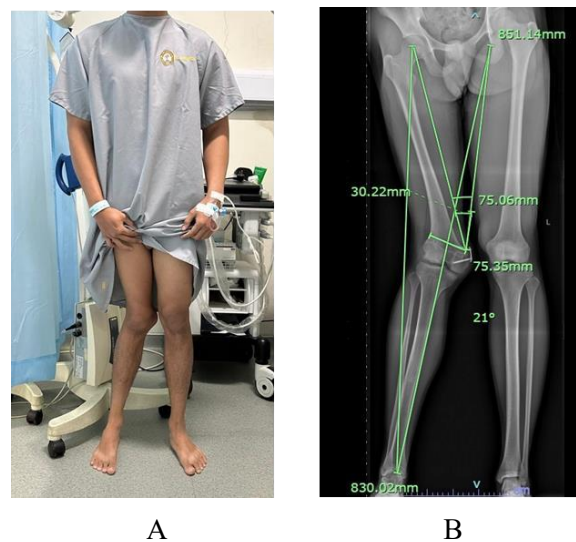


Figure 1. (A) The valgus of the right knee is notable while standing, (B) Standing long leg X-Ray of the patient with 21° of valgus on the right knee

CASE REPORT

Male, 19 years old, reported with a chief complaint of pain in the right knee that is worsening for approximately 2 years. The pain was noticeably present when he walked for long distances or during strenuous activity. Patient had a surgical history of femoral ORIF 6 years ago due to a traffic accident

and epiphysiodesis were also performed to maintain the length of medial and lateral side of femur, but the implant was never removed.

Upon physical examination, valgus deformity and muscle atrophy on the right knee were present. Patient acknowledged a knock knee that started a year prior which continued exacerbating. This condition was also accompanied by his knee cap that would move outside of the knee every time he flexed his right leg, and returned to its place every time he extended his right leg. We confirmed it through the flexion and extension examination on patient during the first check-up. The radiological examination result showed that the right knee had a 21° of valgus, which indicated that this patient had severe genu valgus deformity.

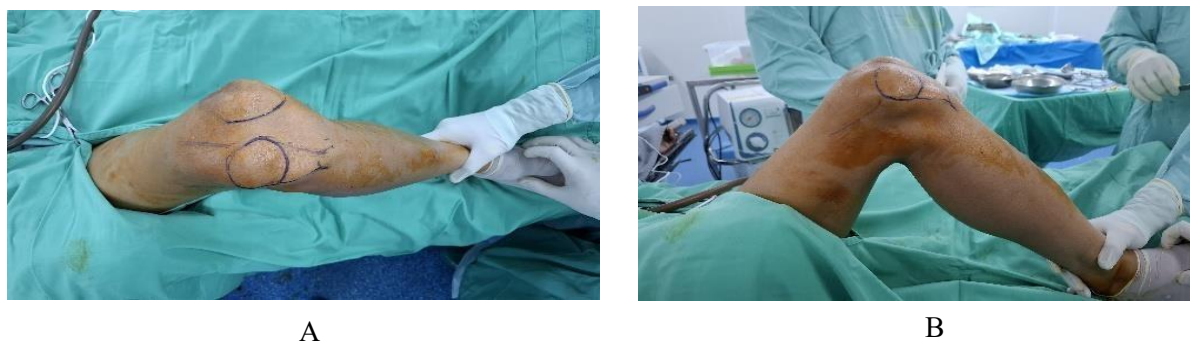


Figure 2. (A) Pre-operative images. (B) Notice the patella that dislocated to the lateral side

The patient agreed to be treated with Neutral-Wedge DFO to correct the genu valgus with MPFL reconstruction. Firstly, we corrected the valgus deformity by determining the CORA alignment of the distal part of the femur with K-wires and confirming it with C-Arm. At this point, we performed partial opening and partial closing wedge correction of the femur that resulted into a Neutral-Wedge DFO and fixed the femur's alignment with Distal Femoral Locking Plate (DFLP) on the lateral side of the right femur.

After DFO was performed, we reconstructed the MPFL using Musculus Semitendinosus graft. We made 2 holes in the superior and inferior part of medial right patella, inserted the graft to the tunnels, and subsequently sutured it using simple suture configuration.

To ensure that the patella is no longer dislocated, we performed flexion and extension movements on the knee during the surgery.

After 90 days of procedure and physiotherapy routine, patient is now able to walk, the genu valgus and patellar dislocation are corrected, and the patient is able to fully extend his knee and almost put his knee to full flexion.

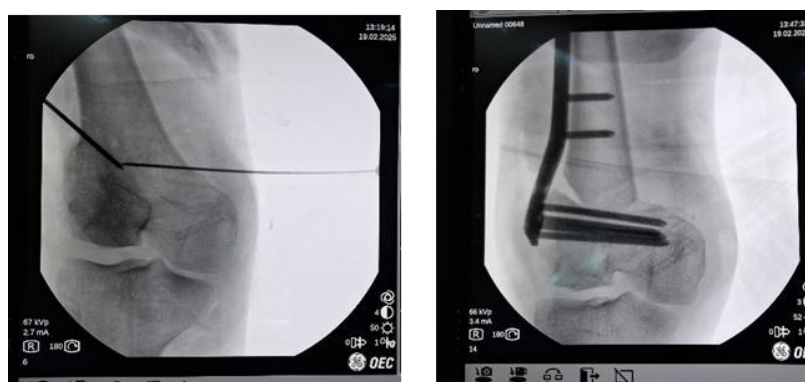


Figure 3. C-Arm X-Ray images of (A) Determining the CORA for Neutral-Wedge DFO with 2 K-wires (B) DFLP is used for fixing femur's alignment after Neutral-Wedge DFO procedure

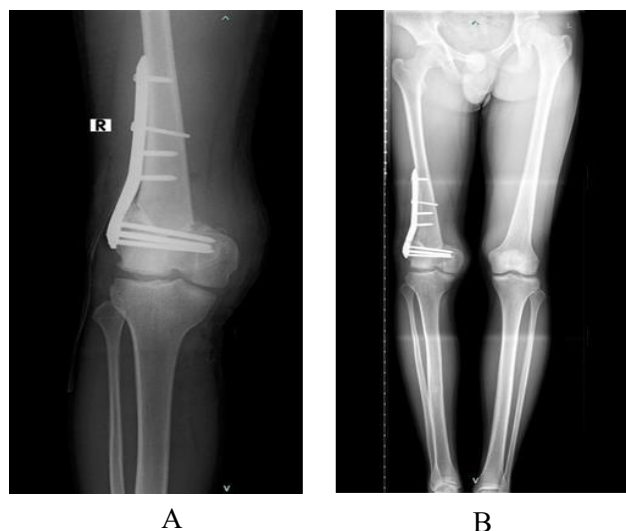


Figure 4. After 90 days of procedures and physiotherapy routine, (A) and patellar and (B) genu valgus dislocation is corrected

DISCUSSION

The presented case illustrates a successful surgical correction of severe valgus knee deformity associated with obligatory patellar dislocation through a combination of Neutral-Wedge Distal Femoral Osteotomy (DFO) and Medial Patellofemoral Ligament (MPFL) reconstruction. The coexistence of a pronounced valgus deformity and recurrent patellar instability represents a complex biomechanical problem requiring both osseous realignment and soft tissue stabilization to restore knee joint congruence and function.

A variety of surgical techniques have been proposed for the management of habitual and obligatory patellar dislocations. However, previous studies have demonstrated that isolated soft tissue procedures often fail to achieve long-term stability in cases with significant bony malalignment. Therefore, combined surgical approaches that include realignment procedures are strongly recommended to achieve more satisfactory and durable outcomes, as they correct both the abnormal joint angle and the altered mechanical axis contributing to instability (Kwak., et al, 2011).

The reconstruction of the MPFL has become the cornerstone procedure in restoring medial patellar stability, as this ligament is the primary passive restraint against lateral patellar displacement during the first 30° of knee flexion. The semitendinosus tendon, used as an autograft in this case, is one of the most commonly employed grafts due to its optimal length, strength, and ease of harvest. Although several graft options have been described in the literature, including gracilis tendon, partial quadriceps tendon, partial patellar tendon, allografts, and synthetic materials, no single technique or graft type has been proven superior in clinical outcomes (Kwak, 2011; Enderlein, 2014; Schottle, 2010). The essential factor determining surgical success is accurate anatomical placement and proper tensioning of the reconstructed ligament to maintain physiological patellar tracking throughout the range of motion.

DFO plays a crucial role in addressing the underlying valgus deformity by restoring the mechanical alignment of the lower limb and redistributing the load across the knee joint. While opening- and closing-wedge DFO techniques have been widely discussed, studies comparing

the two remain limited and methodologically heterogeneous (Olivero., et al, 2017). Most evidence suggests no definitive superiority of one technique over another, as outcomes often depend on patient-specific factors and surgeon preference (Chahla., et al, 2016). In this case, the Neutral-Wedge DFO was selected to achieve simultaneous partial opening and closing correction, thereby minimizing bone loss and preserving overall limb length. This technique effectively reduced the valgus angle while maintaining adequate stability for subsequent fixation with a Distal Femoral Locking Plate (DFLP).

The postoperative outcome at 90 days demonstrated excellent alignment correction, restoration of patellar tracking, and significant improvement in function, as evidenced by the patient's ability to walk and perform full knee extension with near-complete flexion. This case reinforces the importance of addressing both the mechanical axis deviation and soft tissue insufficiency in treating complex patellofemoral instability associated with genu valgum. Furthermore, it suggests that the Neutral-Wedge DFO, when combined with MPFL reconstruction, may serve as a reliable surgical option for young, active patients presenting with severe valgus deformity and obligatory patellar dislocation. Nevertheless, despite the promising clinical outcome, long-term follow-up and larger case series are necessary to validate the biomechanical advantages, safety, and durability of the Neutral-Wedge DFO technique, as current evidence remains limited.

CONCLUSION

This case underscores the clinical potential of the Neutral-Wedge Distal Femoral Osteotomy (DFO) as an effective surgical option for correcting severe genu valgus deformity, while concomitant Medial Patellofemoral Ligament (MPFL) reconstruction using a semitendinosus autograft provides reliable stabilization of the patella following realignment. The favorable outcome achieved in this case demonstrates that Neutral-Wedge DFO can restore mechanical axis alignment and optimize patellofemoral tracking without compromising limb length or joint stability.

Although the current evidence regarding Neutral-Wedge DFO remains limited, this report contributes to the growing clinical understanding of its biomechanical advantages and postoperative functional outcomes. The success observed in this case challenges the conventional reliance on opening- or closing-wedge osteotomies and suggests that the Neutral-Wedge approach may represent a viable alternative in selected patients. Further clinical studies and comparative analyses are warranted to validate its long-term efficacy, safety, and reproducibility in the management of complex valgus deformities accompanied by obligatory patellar dislocation.

CONFLICT OF INTEREST

The author(s) declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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None

PATIENT CONSENT STATEMENT

Verbal consent was obtained from the patient for the case report

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request

GENERATIVE AI STATEMENT

The author(s) declare that no Generative AI was used in the creation of this manuscript

LIST OF ABBREVIATIONS

CORA : Center of Rotation of Angulation
DFO : Distal Femoral Osteotomy
DFLP : Distal Femoral Locking Plate (DFLP)
MPFL : Medial Patello-Femoral Ligament
ORIF : Open Reduction and Internal Fixation

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