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Temporary Epiphysiodesis in Treating Genu Valgum in Pediatric Age Group: A Growth Modulation Approach

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Abstract: ***Background: Genu valgum (knock knees) can cause functional issues if left uncorrected. Temporary epiphysiodesis allows gradual correction by guided growth. Objective: To assess the efficacy of temporary epiphysiodesis using tension band plating in pediatric genu valgum. Methods: 25 children (50 limbs), aged 8–14, underwent medial distal femoral or proximal tibial epiphysiodesis. Mechanical axis deviation (MAD) and intermalleolar distance (IMD) were measured pre - op and post - op at 6 - month intervals. Results: MAD improved from 25.4 mm to 7.6 mm. IMD decreased from 12.2 cm to 4.1 cm. Mean correction time: 13.2 months. Conclusion: Temporary epiphysiodesis is a safe and effective intervention in growing children with idiopathic genu valgum.***

Keywords: Genu valgum, temporary epiphysiodesis, tension band plating, pediatric orthopedics, guided growth

1. Introduction

Genu valgum is a common developmental condition in children. Persistent deformity beyond the physiological age can cause abnormal gait, joint degeneration, and psychosocial issues. Surgical options include corrective osteotomy and guided growth techniques. Temporary epiphysiodesis using a tension band plate (Eight - plate) is minimally invasive and harnesses natural growth potential for deformity correction. This study evaluates its outcomes in children with idiopathic genu valgum.

2. Materials and Methods

- Study Design: Prospective interventional study conducted at Jhalawar medical college from December, 2023 to December, 2024.

Inclusion Criteria:
- Children aged 8–14 years
- Idiopathic genu valgum with MAD >15 mm or IMD >10 cm
- Open physes confirmed radiologically

Exclusion Criteria:
- Skeletal dysplasias, metabolic bone disease
- Previous corrective surgery
- Less than one year of remaining growth.

- Surgical Technique: Tension band plating was performed on the medial distal femoral or proximal tibial physis. A two - hole Eight - plate with 4.5 mm screws was used. Full weight - bearing was encouraged postoperatively.

  Follow - Up: Patients were followed every 6 months with standing scanograms and clinical assessment.

3. Results

Table 1: Patient Demographics and Follow - Up

Parameter	Value
Total number of patients	25
Total limbs treated	50
Mean age (years)	11.2 ± 1.6
Gender ratio (M: F)	13: 12
Mean follow - up duration	18 months
Mean time to correction	13.2 ± 2.8 months

Table 2: Radiological and Clinical Outcomes

Parameter	Preoperative Value	Postoperative Value	p- value
Mechanical Axis Deviation (MAD)	25.4 ± 4.8 mm	7.6 ± 3.1 mm	<0.01
Intermalleolar Distance (IMD)	12.2 ± 2.3 cm	4.1 ± 1.9 cm	<0.01

Table 3: Outcome Distribution

Outcome	Number of Patients	Percentage (%)
Complete correction achieved	23	92%
Partial correction	2	8%
Rebound valgus after implant removal	2	8%
Overcorrection	0	0%
Implant - related complications	0	0%
Superficial infection	1	4%

4. Discussion

This study demonstrates that temporary epiphysiodesis using a tension band plate is an effective and safe method for correcting idiopathic genu valgum. The majority of patients achieved full correction within 12–16 months. Rebound deformity in a small subset underlines the importance of close monitoring post - removal. Compared to osteotomies, the method offers fewer complications, less morbidity, and quicker recovery.

Limitations include a relatively small sample size and limited long - term follow - up. Future studies should assess long - term function and recurrence into adulthood.

5. Conclusion

Temporary epiphysiodesis using tension band plating is a minimally invasive, growth - friendly, and effective technique for treating idiopathic genu valgum in pediatric patients, provided that patients are carefully selected and closely monitored.

References

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Figures

Figure 1: Preoperative full - length standing X - ray showing mechanical axis deviation in both limbs.

Figure 2: Immediate postoperative AP and lateral views of the right and left knees showing placement of tension band plate across the medial distal femoral physis.

Figure 3: Post op clinical picture.