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Treatment Of Ankle Varus Deformity Due To Physeal Bar Formation: A Case Report

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INTRODUCTION:

Ankle fractures make up 5% of all fractures and 15–20% of all growth plate injuries in children, making them the most common growth plate injury in the lower extremity. The distal tibial physis is the second most common site for growth plate injuries, following the distal radius. It contributes 40% of the tibia's longitudinal growth, while the proximal physis accounts for 60%. Injury to the distal tibial physis can result in growth arrest, angular deformities, and leg length discrepancy due to bone bar formation.

REPORT:

A 9-year-old girl patient admitted to at another hospital due to ankle fracture 18 months prior after a motorcycle accident and sustained lateral malleolus fracture (SH type II) and closed fracture medial malleolus (SH type IV) and she underwent closed reduction and percutaneous K wire. Thereafter, the patient was admitted to our center because of the progressive deformity, pain, and limb leg discrepancy. On physical examination she had 1 cm shortness of the left extremity and prominent ankle varus deformity. Ankle joint range of motion and neurological examination was evaluated as normal. Radiological evaluation through direct radiography and computed tomography (CT) revealed central bar formation in the tibial distal physis. 20 degrees of varus deformity were measured at the left ankle joint. Distal tibia and fibula osteotomy levels were planned preoperatively on plain radiographs (Fig. 1).

The patient underwent surgery in the supine position under a tourniquet. Initially, a distal tibia closed-wedge osteotomy was performed at the supra malleolar level. This was followed by a distal fibula osteotomy, approximately 7 cm from the tip of the lateral malleolus, with 2 cm of fibular bone resected, allowing for adequate distal tibial realignment.

Physeal bar resection was performed using a bone burr at the osteotomy site, and bone wax interposition was used to fill the resected physeal space in the distal tibia. The osteotomy was then stabilized with two Kirschner wires, and a short-leg cast was applied.

Postoperative radiological follow-up revealed that the patient's ankle alignment was restored, and at the six-week follow-up, the Kirschner wires were removed as an outpatient procedure (Fig 2).


Figure 1

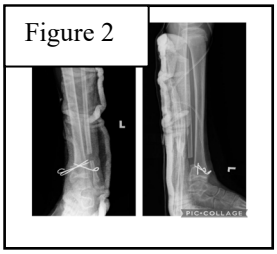
Figure 2

Williamson et al. reported that physeal bar excision leads to favorable outcomes in growing children with sufficient remaining growth potential. In their case series, the average age at the time of resection was 12 years and 7 months. The authors recommended bar excision for skeletally immature children who are still growing and emphasized that at least 2 years or 2 cm of remaining growth is necessary for a successful surgical outcome.

CONCLUSION:

In conclusion bar excision to restore ankle after distal physeal bar formation is a useful and appropriate procedure. It provides restoration of growth arrest and correction of the deformity at the same time preventing the necessity of multiple surgical limb length equalizing procedures

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