

A Comparison of Tension-Band Plate Growth Modulation in Mucopolysaccharidoses Versus Idiopathic Angular Deformities

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INTRODUCTION: Lower extremity angular deformities are common in the pediatric population, especially in patients with mucopolysaccharidoses (MPS), and can cause joint instability and premature arthritis if untreated. Growth modulation with tension-band plates (TBP) is considered safe and effective but few studies have examined its rate of correction in MPS patients. This study compares TBP correction of angular deformities in patients with Hurler and Morquio syndromes (MPS) versus idiopathic etiologies.

METHODS: A retrospective analysis of patients age <18 at a single institution who received TBP between 2005-2017 for valgus angular deformities was conducted. Inclusion criteria were patients with complete data and MPS or idiopathic etiology. Femoral and tibial deformities were evaluated independently. A single orthopaedic surgeon (P.A.) measured all radiographs. Post-surgical x-rays were reported in 6-month intervals.

RESULTS: Twenty-nine patients were included: Hurler syndrome (8), Morquio syndrome (1), and idiopathic angular deformities (20). Twenty-two patients had TBPs on multiple limbs. MPS patients had 5 femoral and 17 tibial TBPs, while idiopathic patients had 14 femoral and 24 tibial TBPs. Femoral TBP corrections at one year were 4.9° (MPS) and 11.2° (idiopathic); total degrees of correction were 7.3° (MPS) and 8.9° (idiopathic). Tibial TBP corrections at one year were 5.8° (MPS) and 5.4° (idiopathic); total degrees of correction were 9.1° (MPS) and 6.0° (idiopathic). The average correction rates for femoral TBPs were 4.3°/year (MPS) and 7.3°/year (idiopathic), and tibial TBPs were 4.5°/year (MPS) and 4.6°/year (idiopathic). There were no statistically significant differences between groups or by gender.

DISCUSSION AND CONCLUSION: MPS patients with femoral and tibial TBPs experienced comparable total and average correction rates to idiopathic patients, although idiopathic patients experienced slightly faster correction rates, which is consistent with prior literature. This demonstrates that TBP is an effective growth modulation technique for MPS patients despite morphological differences.