

A Review of Guided Growth Surgery for Angular Deformity of the Knee: How Predictable is Success?

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INTRODUCTION:

Angular deformity in the lower extremities can result in pain, gait disturbance, cosmetic deformity, and joint degeneration. Up until the introduction of guided growth in 2007, which has since become the gold standard, treatment for frontal plane angular deformity around the knee in skeletally immature patients had been either an osteotomy, a hemiepiphysiodesis, or the use of staples. Guided growth modulation uses the tension band principle with the goal of treatment being to normalize the lower limb mechanical axis resulting in lower morbidity than previous treatments. In order to assess the success of this procedure we reviewed our results in an attempt to identify patients who may not benefit from this simple and elegant procedure.

METHODS:

We performed a retrospective review of prospectively collected surgical records and diagnostic imaging in our pediatric tertiary referral center to identify all patients who had guided growth surgery for frontal plane deformity of the knee from 2007 to 2020. We noted the patient demographics, diagnosis, perioperative experience, and outcome. All patients were followed until skeletal maturity or until their metalwork was removed.

RESULTS:

A total of 267 patients (323 legs) were assessed for eligibility. Seventeen were excluded for inadequate follow up or loss of records. Of the 306 treated legs which met the criteria for final assessment, 61 (19.8%) were unsuccessful; the other 245 (80.2%) were deemed successful at final follow up. Complications were few, but included infection and metal-work prominence. Procedures that were unlikely to be successful included growth disturbances due to mucopolysaccharide storage disease (28% failure rate), Blounts disease (66.6% failure rate), and achondroplasia (37.5% failure rate). If you exclude those three diagnoses, success rate for all other conditions was 85.4%.

DISCUSSION AND CONCLUSION:

In our hands, guided growth had an 80.3% success rate when all diagnosis were considered. We continue to advocate the use of guided growth as a successful treatment option for skeletally immature patients with limb deformity however caution should be employed when considering its use in certain patient groups.