The Incidence of Acute Neurological Complications Following Decancellation Osteotomy for Fixed Sagittal Deformity

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Purpose: Transpedicular decancellation osteotomy provides correction for fixed sagittal plane deformity and biomechanical stability. There is a paucity of literature regarding the acute neurological complications related to these complex reconstructive procedures.

Methods: A retrospective consecutive case series of patients with kyphotic deformity and associated sagittal imbalance from a single surgeon were identified. Inclusion criteria were patients undergoing corrective decancellation osteotomy with segmental spinal instrumentation. Medical records, clinic notes, standard upright radiographs pre- and post-operatively were reviewed.

Results: 31 patients (F: 16, M: 15) at a mean age of 62.5 ± 5.6 years were followed for a mean follow-up of 26.4 ± 3.7 months. 30/31 patients had previous spinal surgery, and the remaining 1 patient had a kyphotic deformity related to TB. Operative level was C7 (n=1), L1 (n=2), L2 (n=5), L3 (n=16), L4 (n=1), and multiple spinal segments at the T-L junction (n=3). Supplemental interbody fusion was performed by anterior or transpoas approach in 55% (n=17).

The sagittal vertical axis was 15.4cm preoperatively, 5.3cm postoperatively, and 6.1cm at most recent follow-up. All patients were neurologically intact immediately postoperatively. 1 patient (3%) had a delayed lower extremity neurological deficit after mobilizing in the postoperative period without hardware complication. Nonunion was seen at most recent follow-up in 9.7% (n=3), proximal breakdown in 14% (n=5), and failure of fixation in 14% (n=5).

Conclusion: Decancellation osteotomy for the treatment of fixed sagittal deformity is a risky but relatively safe procedure with careful surgical technique. Acute neurological sequelae remains a risk of these complex procedures in patients with fixed kyphotic deformities. The relatively high early complication rate requires careful patient selection and informed decision making prior to undertaking major corrective spinal surgery.