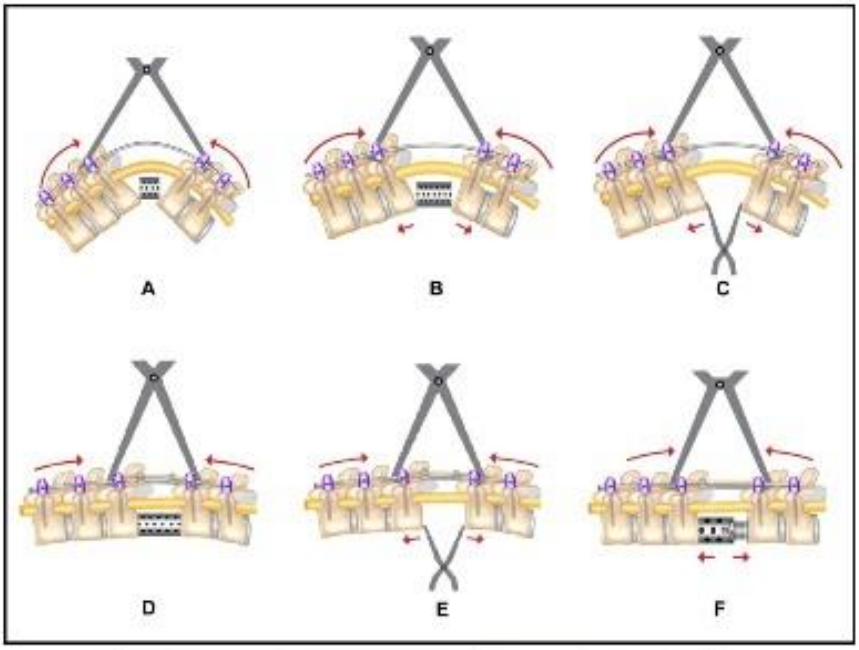
Three-Column Osteotomy for the Surgical Treatment of Dropped Head Syndrome Due to the Cervicothoracic-Upper Thoracic Proximal Junctional Failures Following Adult Spinal Deformity Surgery: Radiologic and Clinical Outcomes

Introduction: Severe proximal junctional failures (PJF) following adult spinal deformity surgery can result in Dropped head syndrome (DHS) is characterized by severe kyphotic deformity at the cervicothoracic-upper thoracic (CT-UT) spine. Severe kyphotic deformity causes significant sagittal imbalance, horizontal gaze difficulty and chin-on chest deformity. Surgical treatment of the severe kyphotic deformity requires three-column osteotomies (3CO) for correction. The aim of this study is to analyze the efficacy and safety of three-column osteotomies in the management of dropped head syndrome due to severe CT-UT PJFs

Methods: 13 (6M, 7F) patients who had undergone revision surgery with 3CO for dropped head syndrome were included. These patients had undergone their primary adult spinal deformity surgeries at different centers and were admitted to our clinic for revisions. Pre-revision, post-revision, and f/up whole spine standing x-rays were evaluated for cervical and global sagittal alignment parameters. Clinical assessment was done with ODI.

Results: The mean age was 42 (18-79) years and the mean f/up was 5 (2-15) years. 3COs were performed between T2-T4 levels. 3 patients had PSO, 2 patients had Bone-disc-bone resection and 8 patients had PVCR for deformity correction. Preop mean local kyphosis angle of 66° improved to 14° (79%). All global and cervical sagittal alignment parameters improved postoperatively. Gradual anterior column lengthening technique following PVCR provides proper sagittal alignment restoration both regionally and globally and also avoids iatrogenic neurologic deficit by preventing dural bucking. 7 patients who had preop neurologic deficits had at least one-grade improvement at the final f/up. The most common complication was dural tears in 3 patients (23%) during PVCR. ODI decreased from 63 to 17. Solid fusion was achieved in all patients.

Conclusion: Three-column osteotomy enabled significant correction of severe proximal junctional failures causing kyphotic and rigid deformity, improved neurological deficit and provided proper global and regional sagittal alignment. Anterior column lengthening at the level of osteotomy following PVCR procedure enables greater and safer deformity correction.


A
B
C
D
E
F


65y, F
+105°
+24°