C5 Posterior Column Osteotomy for Complex Cervical Kyphosis Following Failed Anterior Cervical Discectomy and Fusion: A Case Report

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Abstract (300 word limit)

Title: C5 Pedicle-Subtraction-Osteotomy (PSO) for Focal Cervical Kyphosis Following Failed Anterior Cervical Discectomy and Fusion: A Case Report

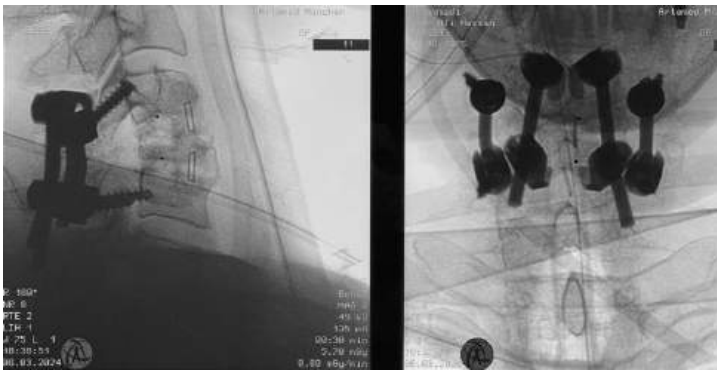
Introduction: Anterior cervical discectomy and fusion (ACDF) is a standard surgical intervention for cervical spine pathology; however, complications such as cage subsidence and cervical malalignment can occur, necessitating revision surgery. We present the case of a 49-year-old male with spondyloarthritis and osteoporosis who developed symptomatic cervical kyphosis following failed ACDF. Due to the particular aspects of the case (global malalignment, neck pain, secondary anterior osteophytic bridging and the need for posterior stabilization) and the risks associated with ventral revision surgery, an all-posterior approach was considered.

Case Presentation: The patient had undergone ACDF at C4-C6 levels using PEEK cages 18 months prior, resulting in persistent neck pain and radiculopathy in the C5 dermatome. Despite conservative measures and posterior foraminotomies (Frykholm), symptoms persisted. We weighed the relative risks and benefits of a repeat anterior approach with 2-level-corpectomy and reconstruction plus additional posterior fixation versus an all-posterior option – even though cervical PSO at the C5-level has not previously been described. A PSO of the C5 vertebrae was performed, achieving a 30-degree improvement in alignment

Management and Outcome: Key factors influencing the decision-making process included the patient's underlying spondyloarthritis, osteoporosis, and the possibility of existing infection. The surgical procedure under multimodal intraoperative neuromonitoring (mIONM) involved meticulous exposure, pedicle subtraction osteotomy with complete removal of all posterior elements of C5, and instrumentation placement, resulting in successful correction of cervical malalignment and preservation of neurological function. The patient's immediate postoperative course was largely uneventful, with early mobilization and return to functional status.

Conclusion: This case highlights the potential value of posterior corrective spinal osteotomies also at higher cervical levels, in our case at C5, in managing complex cervical kyphosis following failed ACDF, particularly in patients with comorbidities such as spondyloarthritis and osteoporosis. By carefully considering patient-specific factors, favorable outcomes can be achieved, with significant improvement in symptoms and quality of life. Long-term follow-up is essential to assess the durability and efficacy of this surgical intervention in maintaining spinal stability and functional outcomes.

Image



Recent Publications

1. Sivaganesan A, Kim HJ. A Review of Indications, Surgical Technique, and Outcomes for the Cervical Pedicle Subtraction Osteotomy. J Am Acad Orthop Surg. 2022 Feb 1;30(3):e295-e300. doi: 10.5435/JAAOS-D-21-00177. PMID: 35772089.
2. Safaee MM, Tan LA, Ames CP. Posterior osteotomy techniques for rigid cervical deformity correction. J Spine Surg. 2020 Mar;6(1):274-279. doi: 10.21037/jss.2020.01.07. PMID: 32309665; PMCID: PMC7154347.
3. Wollowick AL, Kelly MP, Riew KD. Pedicle subtraction osteotomy in the cervical spine. Spine (Phila Pa 1976). 2012 Mar 1;37(5):E342-8. doi: 10.1097/BRS.0b013e318245bcd4. PMID: 22366945.
4. Cecchinato R, Langella F, Bassani R, Sansone V, Lamartina C, Berjano P. Variations of cervical lordosis and head alignment after pedicle subtraction osteotomy surgery for sagittal imbalance. Eur Spine J. 2014 Oct;23 Suppl 6:644-9. doi: 10.1007/s00586-014-3546-x. Epub 2014 Sep 12. PMID: 25212442.
5. Yoshihara H, Abumi K, Ito M, Kotani Y, Sudo H, Takahata M. Severe fixed cervical kyphosis treated with circumferential osteotomy and pedicle screw fixation using an anterior-posterior-anterior surgical sequence. World Neurosurg. 2013 Nov;80(5):654.e17-21. doi: 10.1016/j.wneu.2013.01.023. Epub 2013 Jan 9. PMID: 23313237.

Photograph



Biography (150 word limit)

I am a dedicated doctor who began my medical journey in Saudi Arabia, where I studied medicine. In 2016, I relocated to Germany to pursue a residency program in Orthopaedic and Trauma Surgery at the University Hospital in Munich. Throughout my residency, I developed a strong interest in deformity correction, with a particular focus on spinal deformities. My passion and expertise in this area have guided my career trajectory. Since September 2023, I have been working as a spine surgeon, committed to improving patients' quality of life through advanced surgical techniques and personalized care.

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Notes/Comments: