The C7 Pedicle as a Superior Fixation Point in Stabilization for Spinal Metastatic Disease

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Disclosures

Nothing to disclose
**Introduction**

Spinal metastatic disease (SMD) often requires spinal stabilization, however the cervicothoracic junction can be a challenging area to instrument. Anterior approaches may require division of the sternum. Posterior/posteriolateral approaches may rely on cervical lateral mass screws for superior construct fixation that are more prone to screw pullout than pedicle screws. The C7 pedicle is able to support screws in most instances. When the C7 pedicle is used as a superior fixation point, it aligns with the thoracic pedicles below to create a rigid posterior construct.
Methods

One hundred thirty-nine consecutive spinal operations at an NCI-designated cancer institute were retrospectively reviewed to identify patients who underwent posterior spinal stabilization for SMD in whom a C7 pedicle screw was placed as the superior fixation point. Patient age, primary disease, and clinical and radiographic information were identified. Follow-up time was noted and follow-up outcomes were based on clinical history and spinal imaging.
Results

Three patients were identified who underwent separation surgery for SMD that included posterior spinal stabilization with C7 pedicle screws as the superior fixation point. Case 1 was a 70-year-old woman with a history of breast adenocarcinoma presenting with right upper extremity and intrascapular pain as well as myelopathy (Figure 1). Case 2 was a 64-year-old man with a history of myxoid liposarcoma of his left lower extremity presenting with intrascapular pain and rapid sensory and motor deterioration (Figure 2). Case 3 was a 75-year-old man with a history of prostate carcinoma, thyroid carcinoma, and basal cell skin carcinoma presenting with right scapular, shoulder, and right upper extremity pain along with paresthesias in that arm (Figure 3). All patients underwent preoperative computed tomography angiography to localize vertebral arteries. Average follow-up time was 20.7 months. There were no occurrences of hardware failure, neurologic deterioration, or protracted pain in the cases analyzed.
Figure 1
A: Preop CT scan (left) and axial image at T2 level (right) showing pathologic fracture. B: T2 axial view of C7 pedicle screws on 32-month postop CT scan. C: Anteroposterior radiograph of C7-T5 posterior pedicle screw instrumentation construct at 32 months postop.
Figure 2

A: Preop MR sagittal image showing T2 pathologic fracture with epidural disease (left) and axial image (right) at level of T1 as indicated by scout line. B: Postop CT scan of C7 to T4 posterior pedicle screw instrumentation.
**Figure 3**

**A**: Preop MR image showing T1 lesion with epidural extension (left), axial at T1 (right).  
**B**: Postop CT scan of C7-T3 pedicle screw instrumentation with right sided decompression and tumor resection (left), axial at C7 level (right) showing C7 pedicle screw.
Discussion

Overall, we have had good surgical outcomes with improvement in pain without neurovascular injury or evidence of hardware failure. Our findings add to a small but considerable number of studies showing efficacy of C7 pedicle screws in spinal oncology, specifically in metastatic lesions. In our experience, the C7 pedicle has provided a useful superior fixation point solution for the posterior stabilization of high thoracic vertebral body metastases. Bearing in mind this surgical option may help spinal surgeons address the stabilization of SMD in this region.