

# Fracture of fusion mass following anterior cervical plate removal: Case report



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## ABSTRACT

We present the case of a delayed pseudoarthrosis resulting from a fracture at the site of a radiographically confirmed anterior cervical fusion following plate removal. In this case, an anterior cervical plate was removed to allow for further surgery at a supra-adjacent level. A modicum of literature exists describing delayed fractures following hardware removal in thoracolumbar fusion constructs. The development of a fracture/pseudoarthrosis following hardware removal at the site of a radiographically confirmed anterior cervical fusion has not been previously reported. We describe the clinical presentation and operative management in the case of this rare and unexpected complication.

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## 1. Introduction

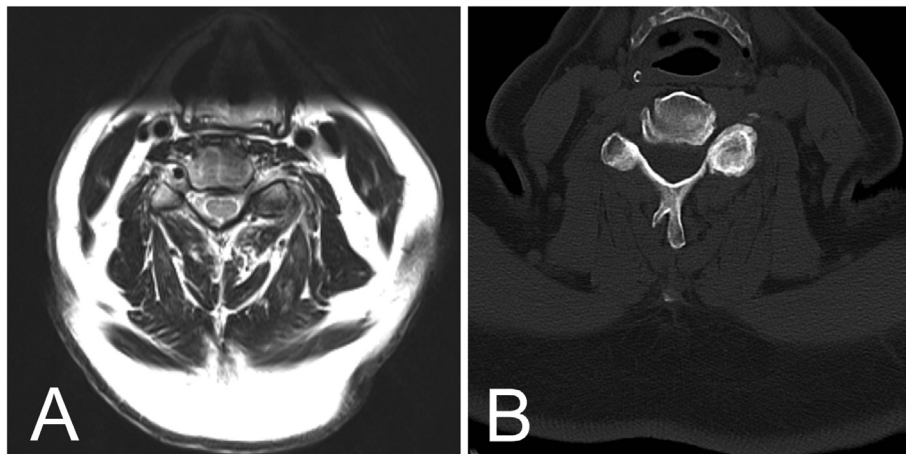
The anterior approach to the cervical spine for the purpose of discectomy and fusion was first described in 1958 simultaneously by Dr. Cloward and Drs. Smith and Robinson [1,2]. Since that time the procedure has evolved to include various types of instrumentation. The anterior cervical discectomy and fusion (ACDF) is now one of the most frequently performed spinal operations. The issue of whether anterior cervical plating improves fusion rates for single or multi-level procedures has been debated but, more and more, anterior cervical instrumentation is becoming commonplace [3–7].

Unfortunately, some patients may develop adjacent segment disease, pseudoarthrosis, or infection requiring a second surgical intervention of the cervical spine, often via repeat anterior exposure [8–10]. In cases of infection or surgery for adjacent level disease, surgeons may be required to remove a previously placed anterior cervical plate. When there is radiographic or intraopera-

tive evidence of healthy arthrodesis at a given level, fused segments may not be re-plated during reoperation. Little has been written about the natural history of fused cervical segments following anterior plate removal.

Several reports in the scoliosis literature have described the progression of sagittal or coronal curves following hardware removal in thoracolumbar fusion constructs [11–15]. More rare still are reports of atraumatic fractures developing in a thoracolumbar fusion mass following instrumentation removal [13,16–18].

To the best of our knowledge, no reports have been written describing delayed fracture resulting in a pseudoarthrosis at a radiographically confirmed anterior cervical fusion segment following anterior plate removal. We present the case of a delayed pseudoarthrosis or fracture at the site of a radiographically confirmed anterior cervical fusion following plate removal. Clinical presentation and surgical management are described.



**Fig. 1.** A. Axial CT and B. T2-weighted MRI of the cervical spine revealed adjacent segment disease at C4-5. Compression of the exiting C5 nerve root on the right is noted with disk herniation and bony overgrowth into the foramen.

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## 2. Case report

### 2.1. Case

#### 2.1.1. History

The patient is a 66 year old Caucasian male with a medical history of hypertension who previously underwent a C5-6, C6-7 ACDF at another institution for cervical spondylosis and radiculopathy some 5 years prior. He subsequently presented to our clinic with signs and symptoms consistent with a left C5 radiculopathy sug-



**Fig. 2.** Sagittal CT reconstructions of the cervical spine revealing bridging bone at the C5C6 and the C6-C7 anterior cervical arthrodesis.

gestive of adjacent segment disease at C4-5, a diagnosis that was confirmed on MR imaging of the cervical spine (Fig. 1). Thorough review of CT imaging of the cervical spine revealed healthy bony bridging and incorporation of the previously placed interbody spacer, all suggestive of a healthy anterior cervical arthrodesis (Fig. 2). Subsequent lateral flexion-extension X-rays of the cervical spine revealed no evidence of anteroposterior motion between the vertebral bodies at C5-6 or C6-7, nor evidence of interspinous widening suggestive of segmental instability (Fig. 3). The patient subsequently underwent an anterior cervical approach for removal of C5-7 anterior cervical plate and C4-5 anterior cervical discectomy and fusion. Surgery was significant for scarring in the anterior cervical soft tissue with dense esophageal adhesions to the previously placed cervical plate—ENT assistance was required to complete exposure. Post-operatively, the patient did well clinically with improved neck and left arm symptoms. He was discharged without incident and eventually weaned from his cervical collar. Upon second postoperative follow up, however, two months after surgery, he noted recurrent severe neck pain without radiculopathy. He denied any trauma.

#### 2.1.2. Examination

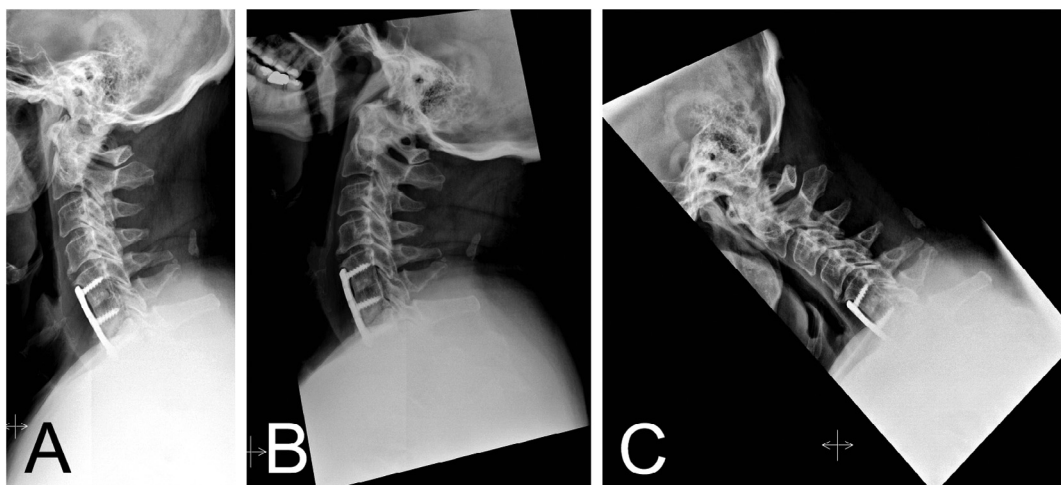
On exam, he remained full strength in both upper extremities without a left upper extremity sensory deficit. Repeat CT scan of the cervical spine revealed a new lucency in the interbody space at C6-7 consistent with a new fracture (Fig. 4). Review of the dynamic lateral XR of the cervical spine did not reveal frank anterolisthesis of C6 on C7, but a subtle kyphosis was noted with flexion (Fig. 5).

#### 2.1.3. Operation

The patient subsequently underwent a bilateral C6-7 facet block with short but significant improvement in pain. The decision was made to proceed with posterior cervical instrumented fusion—a second re-do anterior approach was decided against given the concerning esophageal adhesions seen during the prior operation. The patient was then taken to surgery for a C4-7 posterolateral arthrodesis with C4-7 lateral mass screw and rod fixation and C6-7 interspinous wiring. The surgery proceeded without complication.

#### 2.1.4. Postoperative course

The patient did well post-operatively – he noted post-surgical neck pain but an overall improvement in the pre-operative axial



**Fig. 3.** Dynamic X-rays of the cervical spine reveal no pre-operative evidence of anteroposterior motion or interspinous widening suggestive of segmental instability. Lateral, extension, and flexion views shown (A, B and C respectively).

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