

C4 anterior cervical corpectomy with fusion for cervical spondylotic myelopathy

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Learning targets

- Learn the anterior Smith–Robinson approach of the cervical spine.
- Learn the technique of cervical corpectomy and anterior spinal cord decompression.
- Understand the importance of posterior longitudinal ligament resection to achieve a good decompression.
- Learn anterior cervical spine reconstruction and instrumentation with cage and plate.

Introduction

Cervical spondylotic myelopathy (CSM) is a common cause of spinal cord compression especially in the elderly. When neurological symptoms appear without sustained remission an operative management can be proposed to treat CSM. Goals of surgical treatment are spinal cord decompression, deformity prevention, and pain alleviation

[1]. Many surgical techniques have been described which can employ an anterior, posterior, or circumferential approach. Designing the most effective surgical plan is dependent on numerous factors, including the location of the compressive pathology, stability of the spinal column, extent of the disease, medical comorbidity, and the surgeon's experience with specific procedures.

Anterior Cervical Corpectomy with Fusion (ACCF) is an efficient way to treat CSM with satisfying results. Single-level corpectomy is generally considered safe and associated with successful outcomes for CSM [2].

Case description

This case describes a 72-year-old man presenting a CSM with increasing disability since 1 year. He presented paresthesia in the four members with a weakness of the right arm and right leg responsible for walking difficulties. MRI (Fig. 1) shows a major medullary canal stenosis at C3/C4 and C4/C5 levels and behind C4 body. Edematous changes in the spinal cord in cervical spine MRI T2 sequences could also be observed. The patient completed auto-evaluation with NDI (12 %) and EMS (13 %) functional scores and SF-12 quality of life score (PSC = 47, MCS = 43).

A C4 ACCF was proposed to relieve the pain of patient and allows him to rehabilitate walking by realizing the medullary canal by decompression and providing stability with fusion.

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Fig. 1 Preoperative MRI with CSM regarding C4 body and T2 hyperintensity of the spinal cord

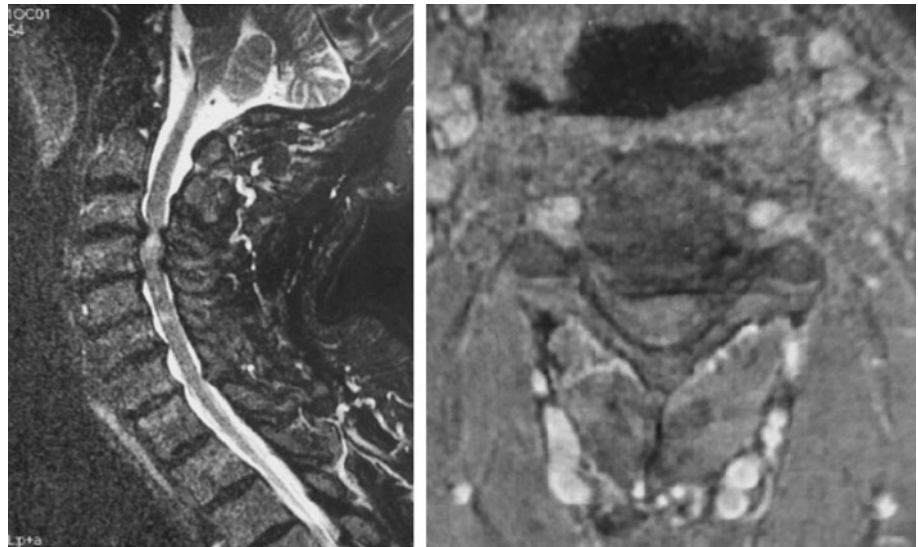
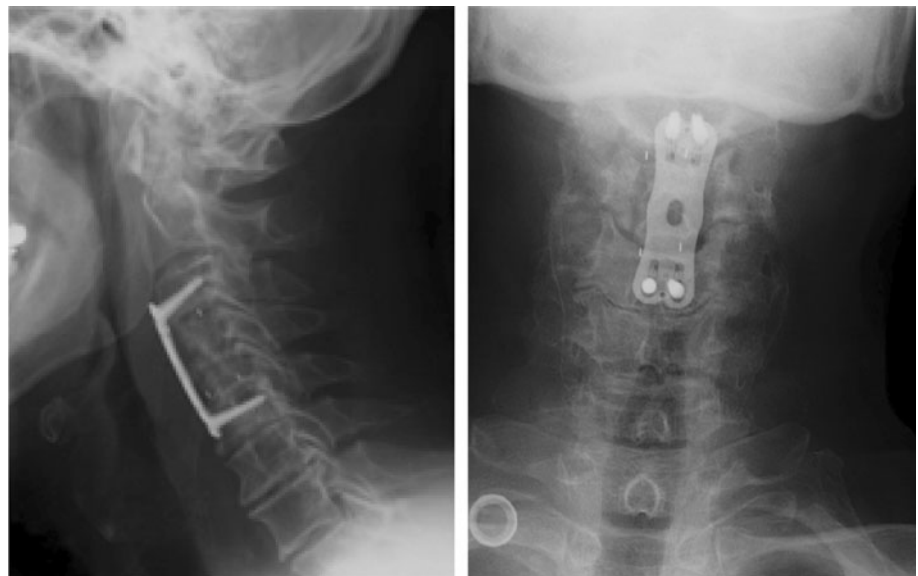


Fig. 2 Postoperative X-rays after C4 corpectomy and reconstruction by cage and plate



Surgical procedure: short version

A classic right Smith–Robinson approach was performed, the omohyoid muscle was preserved. The longus cervicis muscles are retracted from C3 to C5 body. An anterior cervical C3/C4 and C4/C5 discectomy was realized. C4 body was removed by realizing two trenches along the uncus line. The bone collected from the C4 body was kept aside. The posterior longitudinal ligament can then be entirely removed as well as the osteophytes behind C3 distal endplate and C5 proximal endplate. A carbon fiber interbody corpectomy cervical cage filled with the bone previously collected replaces C4 body. An anterior plate was then added from C3 to C5 body for an immediate stability and a better fusion rate.

Postoperative information

The patient stands up the day after the surgery with X-ray control at day 2. A soft cervical collar is needed for 2 months. The patient left the hospital at day 5 with a beginning of symptom improvement. The postoperative X-ray (Fig. 2) shows the good position of the implants and a satisfying cervical lordosis.

Discussion and conclusion

When a CSM surgery is decided the choice of the procedure was among anterior, posterior, or combined approach. The ideal surgical treatment option for CSM remains

controversial since no proper randomized trial has demonstrated any surgical technique to be superior to any other. Regardless of surgical technique employed, results of operative treatment generally are better in patients who undergo early decompression [3]. Under most circumstances, one approach will produce optimal results [4] and we consider that combined approach in one step should be avoided. Anterior and posterior decompressions (with or without instrumentation) are used with efficient results.

Posterior approach (laminectomy with or without fusion, laminoplasty) can be used when pathology is present dorsally. Disadvantages of posterior approach are the damage of the posterior neck muscles leading to a significant higher rate of long-term axial pain [5] and more C5 root palsy due to traction [6]. This approach is also contraindicated in a kyphotic deformity, and there is limited potential for open deformity reduction with the more common posterior fixation techniques [4].

Complications resulting from anterior approach (ACDF, ACCF) include transient dysphagia, recurrent laryngeal nerve damage, and rarely tracheal or esophageal perforation (<0.25 %) [7]. Advantages of anterior surgery are an easier patient installation, less post-operative infections, and no damage of the posterior neck muscles. It is more radical than posterior surgery in decompressing the nerve tissue by directly removing all of the anterior pathogenic structures such as protruded discs, osteophyte, or ossification lesion. With grafting, immediate stability of cervical spine can be achieved [8] and cervical lordosis is more easily restored [9]. However, increasing the number of vertebral bodies resected during a corpectomy is associated with an increase in graft-related complications and pseudoarthrosis [10].

Surgical approach for multilevel CSM remains controversial. For single- or two-level compression, anterior approach seems to provide a better neurologic recovery [11], less axial long-term pain, and less postoperative palsies. The anterior approach main complication is dysphagia, which remains usually transient (4.8 % of symptoms at 6 months) [12]. In this case the compression is localized from C3–C4 to C4–C5 intervertebral discs and the anterior approach seemed to be the proper approach.

The choice of a corpectomy instead of two anterior cervical discectomies with fusion was guided by the fact that the spinal cord was compressed behind C4 body and two discectomies could not offer the possibility to decompress correctly the spinal cord.

Conflict of interest None of the authors has any potential conflict of interest.

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