Clinical Neurology and Neurosurgery 139 (2015) 258–263

Contents lists available at ScienceDirect

Clinical Neurology and Neurosurgery

journal homepage: www.elsevier.com/locate/clineuro

Anterior cervical corpectomy for cervical spondylotic myelopathy: Reconstruction with expandable cylindrical cage *versus* iliac crest autograft. A retrospective study

Paolo Perrini*, Carlo Gambacciani, Carlotta Martini, Nicola Montemurro, Paolo Lepori

Department of Neurosurgery, Azienda Ospedaliero Universitaria Pisana (AOUP), Pisa, Italy

ARTICLE INFO

Article history:
Received 4 September 2015
Received in revised form 15 October 2015
Accepted 17 October 2015
Available online 20 October 2015

Keywords:
Spondylotic myelopathy
Expandable cage
Corpectomy
Cervical spine alignment
Iliac crest

ABSTRACT

Objectives: To compare retrospectively the clinical and radiographic outcomes between cervical reconstruction with expandable cylindrical cage (ECC) and iliac crest autograft after one- or two-level anterior cervical corpectomy for spondylotic myelopathy.
Patients and methods: Forty-two patients underwent cervical reconstruction with either iliac crest autograft and plating (20 patients) or ECC and plating (22 patients). The average clinical and radiological follow-up period was 77.54 ± 44.28 months (range 14–155 months). The authors compared clinical parameters (Nurick Myelopathy Grade, modified Japanese Orthopedic Association (mJOA) scores), perioperative parameters (hospital stays, complications) and radiological parameters (Cobb's angles of the fused segments and C2–C7 segments, cervical subsidence, fusion rate). Fusion was assessed on flexion–extension X-ray films.
Results: No significant differences between the two groups were found in demographics, neurological presentation, preoperative sagittal alignment, clinical improvement and length of hospitalization. Patients of the autograft group experienced more postoperative complications, although the difference between the two treatment groups was not statistically significant (15 *versus* 4.5%, $p = 0.232$). The fusion rate was 100% in both groups. The average lordotic increase of the segmental angle was significantly greater in the ECC group ($p < 0.05$). Other radiological parameters were not significantly different in the two groups.
Conclusion: Cervical reconstruction either with iliac crest autograft and plating or ECC and plating provides good clinical results and similar fusion rates after one- or two-level corpectomy for spondylotic myelopathy. However, the use of ECC obviates donor site complications and provides a more significant increase of lordosis in segmental angle.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Cervical corpectomy and fusion is an effective surgical technique for the treatment of cervical spondylotic myelopathy and myeloradiculopathy [10,16]. Single- or multilevel cervical corpectomy defects have traditionally been reconstructed with autologous bone grafts such as iliac crest and fibula to restore structural integrity and to maintain the cervical lordosis. Several authors still consider autologous bone graft as the gold standard for anterior cervical reconstruction after corpectomy because it is the only graft with the properties of osteogenesis, osteoinduction and osteoconduction [4,21]. However, donor site morbidity, graft collapse and telescoping of the graft with segmental kyphotic changes have been extensively reported in the literature [22,26,28]. The expandable cylindrical cages (ECCs) represent a recent development in vertebral prosthesis and take advantage of *in situ* controlled distraction to allow preservation of a pre-existing lordosis or efficient correction of a kyphotic spine. The aim of the present study is to compare the clinical and radiographic outcomes in cervical spinal alignment between cervical reconstruction with EEC and iliac crest autograft in a consecutive series of patients with spondylotic myelopathy who underwent one- or two-level anterior cervical corpectomy.

2. Patients and methods

2.1. Patient population

We retrospectively reviewed the records of 42 patients with spondylotic myelopathy who underwent 1- or 2-level anterior

* Corresponding author at: Department of Neurosurgery, Azienda Ospedaliero Universitaria Pisana (AOUP), Via Paradisa 2, 56127 Cisanello – Pisa, Italy.
E-mail address: p.perrini@ao-pisa.toscana.it (P. Perrini).

http://dx.doi.org/10.1016/j.clineuro.2015.10.023
0303-8467/© 2015 Elsevier B.V. All rights reserved.

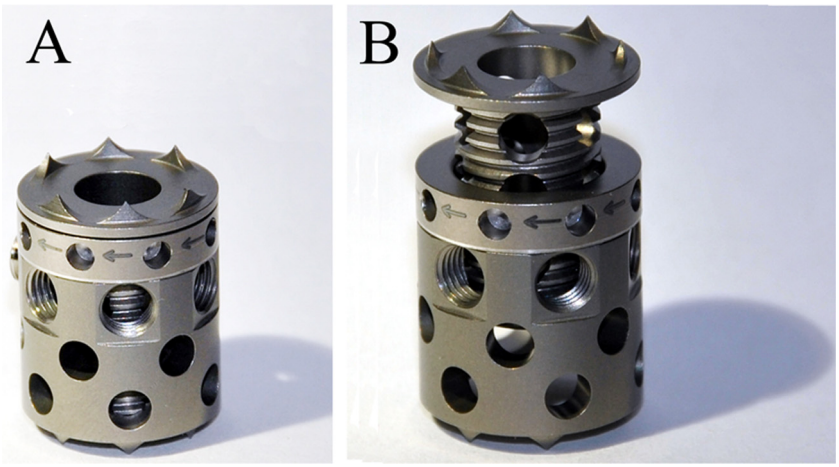

Fig. 1. Photographs showing the anterior distraction device (ADD, Ulrich, Ulm, Germany). (A) The expandable titanium cage is inserted into the corpectomy defect in its non-distracted position. (B) The cage is distracted until it reaches the length of the corpectomy defect. The spikes at both ends increase the stability of the cage at the bone-implant surface.

cervical corpectomy and fusion (ACCF) at our department during a 12-year period (January 2002–December 2013). Our institutional review board approved this study and all patients provided informed, written consent. Clinical indications for cervical corpectomy were signs and symptoms of severe or moderate myelopathy (mJOA $\leq$ 12) or signs and symptoms of mild myelopathy (mJOA > 12) with evidence of progressive neurological decline. Patients with rheumatoid arthritis, posttraumatic deformity of the cervical spine and patients who had a history of previous cervical spine surgery were excluded. The characteristics of vertebral body substitute followed the trends in neurosurgery. Accordingly, 20 patients (14 men and 6 women) of mean age 53 years (range 37–72 years) underwent fusion with tricortical iliac crest autograft (autograft group) early in this series (from January 2002 to September 2008) and 22 patients (17 men and 5 women) of mean age 61 years (range 41–77 years) underwent cervical reconstruction with an expandable titanium cage (ADD, Ulrich, Ulm, Germany) (expandable cage group) late in this series (from October 2008 to December 2013). Clinical and radiological indications for surgery were the same in both groups. Cervical plating was performed in all patients (Osmium, Ulrich, Ulm, Germany). The expandable cage was chosen with an endplate inclination of 0° or 6° according to the anatomy of the corpectomy cavity (Fig. 1). Morcellized bone was usually harvested from the corpectomy and used to fill the cage. All patients were maintained in a firm collar (Philadelphia collar) for 1 month.

2.2. Radiological evaluation and follow-up evaluation

All patients underwent preoperative cervical spine MR imaging, computed tomography (CT) and plain radiographs. A cervical X-ray was obtained before discharge and repeated 3 and 6 months after the operation then annually thereafter. Dynamic flexion and extension views were generally performed 12 months after the operation. Lateral cervical spine radiographs obtained preoperatively and postoperatively were used to measure the cervical lordosis, defined as the angle created by the lower endplate of C2 and C7 using Cobb's method (Fig. 2A). In addition, we measured the curvature of the fused segment or segmental angle by drawing lines along the superior endplate of the superior vertebra and the inferior endplate of the inferior vertebra (Fig. 2B). Subsidence was calculated using the settling ratio described previously by Narotam and colleagues (Fig. 2C) [17]. Successful fusion was defined by lack of segmental movement in flexion–extension radiographic views in the absence of any dark halo around the cage or iliac bone graft [12]. A neurosurgery provider performed clinical follow-up examination after each radiological examination. Clinical findings were evaluated at presentation and latest follow-up using the Nurick

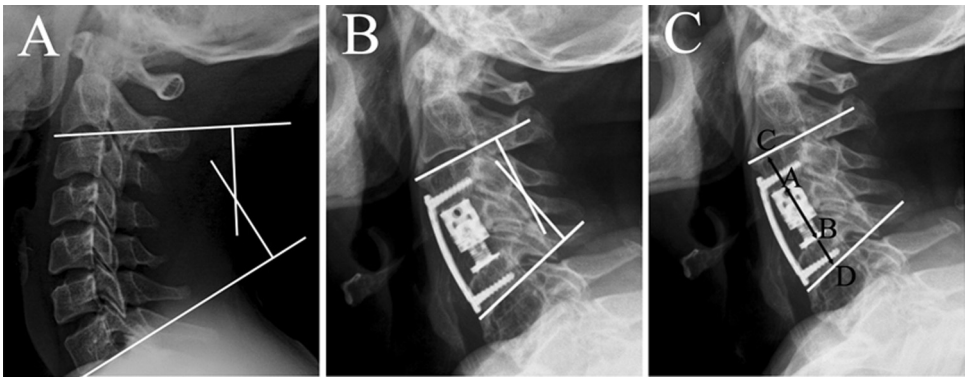

Fig. 2. Lateral radiographs showing the radiological parameters. (A) The cervical lordosis was defined as the angle formed between the lower endplate of C2 and the inferior endplate of C7 using Cobb's method. (B) The segmental angle was defined as the angle formed between the superior endplate of the superior vertebra and the inferior endplate of the inferior vertebra of the fused segment using Cobb's method. (C) The subsidence was defined as the ratio of the cage height (A and B) and the distance between the superior endplate of the superior vertebra (C) and the inferior endplate of the inferior vertebra (D) of the fused segment.

Download English Version:

https://daneshyari.com/en/article/3039794

Download Persian Version:

https://daneshyari.com/article/3039794

Daneshyari.com