

Research Article

Stand-Alone Cervical Cage for Cervical Radiculopathy: A Retrospective Study

I Ketut Martiana¹ , Reyner Valiant Tumbelaka¹

¹Department of Orthopaedic and Traumatology, Faculty of Medicine, Universitas Airlangga/ Dr. Soetomo General Hospital, Surabaya, Indonesia

Correspondence should be addressed to I Ketut Martiana, Department of Orthopedic and Traumatology, Faculty of Medicine, Universitas Airlangga/ Dr. Soetomo General Hospital, Jl. Mayjen Prof. Dr. Moestopo 6-8, Surabaya 60286, Indonesia. e-mail: i-ketut-m@fk.unair.ac.id

ABSTRACT

Background: Cervical radiculopathy is a clinical condition characterized by unilateral arm pain, numbness and tingling in a dermatomal distribution in the hand, and weakness in specific muscle groups that can be treated with nonsurgical or surgical method. This study aims to evaluate the outcome of the stand-alone cervical cage surgical method for cervical radiculopathy in our hospital institution from 2013 to 2017.

Methods: This is a retrospective observational study on every patient who undergoes a stand-alone cervical cage for cervical radiculopathy in our hospital institution from 2013 to 2017. The study runs from December 2017 until April 2018. We evaluated the clinical outcome with the Neck Disability Index (NDI). The data were collected from medical records, and postoperative follow up is done by house visits, phone calls, and outpatient visits.

Results: Five male and one female subjects with a mean age of 58 years old (45–65 years old) underwent the procedure; one patient passed away on three year postoperative due to other events not related to operation procedure; one patient could no longer be reached. Four patient has an increasing score of NDI postoperative. There is no postoperative complication

Conclusion: Stand-alone cervical cage shows a safe and effective treatment providing a favorable clinical outcome for cervical radiculopathy in our hospital institution from 2013 to 2017.

Keywords: Cervical radiculopathy; Stand-alone cervical cage; Neck disability index; Human and medicine

INTRODUCTION

Degenerative cervical spine disease is a pathological change in the cervical spine associated with the degenerative process, also referred to as cervical spondylosis. Although most degenerative changes in the cervical spine are often asymptomatic, it can manifest as three main complex symptoms, including axial neck pain, radiculopathy, myelopathy, or a combination.^{1,2} Axial neck pain refers to pain along the cervical spine and paraspinal muscles.

Cervical radiculopathy characterized by neck pain that radiates to the arm and can be accompanied by radicular sensory or motor deficit.

Stabilization is one of the operative options in managing cervical injuries. In the beginning, this technique was mostly done for non-trauma cases, and there was controversy regarding the use of this technique in trauma cases.^{3,4} In association with these methods, cervical intervertebral disc replacement by a

stand-alone cage provides immediate load-bearing assistance to the anterior column and may promote arthrodesis. Meanwhile, there is data documenting relatively persistent complications in stand-alone cage assisted ACDF, such as cage subsidence and cervical kyphosis.⁵⁻⁷

ACDF is the golden standard to treat degenerative cervical spine operatively. The stand-alone cervical cage fusion is performed to stabilize the segment, maintain foraminal height, and maintain the normal sagittal profile and therefore relieve the symptom of radiculopathy. The indications for stand-alone cervical cage involved recurrent and disabling pain that has failed non-operative modalities. Progressive and significant neurologic deficits and remains gold standard in the surgical treatment of cervical radiculopathy.⁵⁻⁷

In this study, we evaluated the outcome of a stand-alone cervical cage for cervical radiculopathy in our hospital institution clinically.

METHODS

This study was an observational retrospective study in patients who underwent a stand-alone cervical cage procedure for cervical radiculopathy in our hospital institution from 2013 to 2017. This research was conducted at the Orthopedic Outpatient Clinic from December 2017 to April 2018. The samples of this study were all male and female patients who underwent the stand-alone cervical cage procedure for cervical radiculopathy at our hospital institution. The patient characteristics

such as age, sex, duration of follow up was recorded. The measurement of the patient's self-reported neck pain-related disability by using the 10-item questionnaire of the Neck Disability Index (NDI). NDI is a self-report questionnaire used to determine how neck pain affects a patient's daily life and to assess the self-rated disability of patients with neck pain. NDI also used to assess pre-operative and post-operative outcomes in all patients.

RESULTS

Six patients underwent a stand-alone cervical cage procedure in 2013-2017, out of the six patients, 5 were men, with an average age of 58 years (patients aged 45-65 years). Two patients could not be evaluated; one patient died three years after the procedure with the cause of death that was not related to operative procedure; one patient lost from follow up. The longest follow-up duration was four years and the shortest is eight months.

As many as 4 out of 6 patients who could be evaluated experienced an increase in post-operative neck disability index scores. The postoperative complication such as surgical wounds infection, speech disorders owing to an injury to the recurrent laryngeal nerve, airway, and esophageal airway disorders are not obtained. No patient reported limited movement in the neck after the procedure. All of the patients showed improvement in NDI score after the operations. The table showed the decrease of the NDI score, the least score in NDI means better results clinically.



Table 1. Patients Profile

Case	Age (years)	Sex	Follow up duration	Pre-operative NDI Score	Post-operative NDI Score
1	61	F	N/A	N/A	N/A
2	65	M	N/A	N/A	N/A
3	45	M	2 years	42	16
4	58	M	8 months	48	14
5	62	M	2 years	44	12
6	55	M	3 years	50	22

DISCUSSION

One of the main frequently occurring and treated cervical spinal conditions is cervical radiculopathy. Radiculopathy is a condition of the cervical nerve root, usually demonstrates as an assembly of neck and upper limb pain, sensory deficit, or motor disruption.^{1,8} The goal of therapy in Cervical Radiculopathy is to relieve pain, prevent neurological damage, increase functional limitations, and restore or enhance neurological function both operatively and nonoperatively. Operative treatment was performed when there is evidence of progressive neurological deficits, compression of nerve fibers and the symptoms and signs of radiculopathy with persistent pain that was treated conservatively for at least 6-12 weeks.^{4,9}

The efficacy for restoring the intervertebral disc height and lordosis is achieved by the use of stand-alone intervertebral cages, thus providing loadbearing support to the anterior column and inhibiting graft collapse. However, nowadays stand-alone cage also reported some of the problems. For instance, non-union and subsidence into the endplates have been reported as the hardships of these procedures and some surgeons encouraged that plate assisted cervical fusion offers better outcomes

than stand-alone cages.^{10,11}

Nonunion and subsidence have been reported as complications of ACDF using stand-alone cages. Over-distraction, a casualty of the endplate, and osteoporosis are risk factors for subsidence and nonunion. Adequate preparation of both endplates to avoid the impairment of the bony cartilage is an essential factor in decreasing subsidence after ACDF with stand-alone cage.^{8,12}

A study in elderly cervical radiculopathy patients showed there is a significant correlation between patient pain scores and functional limitations in Oswestry Disability Index (ODI) scores ($p < 0.0001$).¹³ In this study, NDI was used to evaluate patient progress at follow-up with the questionnaire system. In this study, there were no complications and no postoperative neurological deterioration. A study showed that there was a significant improvement in patient VAS scores at one year, through this improvement maintained at three years postoperatively. Fifty-one patients underwent 2-level ACDF, and 39 patients underwent 1-level ACDF, usually at the C5/C6 (65%).⁸ Assessment of disability scores on the neck using the NDI showed an increase in all cases. Quality of life is a reflection of the ability of



individuals to cope and adapt to their new living conditions.^{14,15}

CONCLUSION

A stand-alone cervical cage is one treatment option for cervical radiculopathy. Operative therapy is carried out with an indication of a failure of nonoperative therapy. Patient follow-up measurements in this study use the neck disability index with the results of increasing scores in all patients that can be evaluated after follow-up. In this study, we evaluated the clinical outcome of a stand-alone cervical cage for cervical radiculopathy in our hospital institution from 2013 to 2017 and shows a safe and effective procedure providing a favorable clinical outcome. Radiological evaluation and more samples are needed for further study.

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