



Case Report

Recurrent spinal stenoses after implant removal: A case report



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ABSTRACT

Introduction and importance: Cervical spinal stenoses is becoming more and more common due to the aging population. The degenerative changes in the spine including discopathy or spondylosis will constrict and narrow the spinal canal and the usual site for the stenoses is in the cervical and lumbar region. The mainstay of the treatment is surgical, however there still a controversy regarding which approach is the best for the patient with cervical stenoses.

Case presentation: In this case reports we present a case of 63-year-old male who came to our center due to weakness of arms and legs due to cervical spinal stenoses and underwent treatment after which the implant was removed, and the symptoms worsens.

Clinical discussion: We performed Anterior Cervical Discectomy and Fusion (ACDF) and insertion of a cages to stabilize the spine. ACDF associated with lower intraoperative blood loss, similar surgical duration, and complication rate compared with laminoplasty. From the radiological outcome, ACDF showed a better-preserved cervical lordosis, which could affects patient's quality of life.

Conclusion: ACDF is one of the viable methods for the treatment of the cervical stenoses with lower complication rate and good clinical outcomes.

1. Introduction and Importance

Disease of the spine is becoming more and more common in the population. One of the main causes is due to the increased longevity of the people around the globe. The degenerative changes include discopathy or spondylosis, which will constrict and narrows the spinal canal. The usual site for the degenerative changes to occur are in the cervical region and lumbar region [1] (see Figs. 1–3)

Normally, spinal canal in the cervical provides enough space for the neural element to pass through them. The sagittal diameter of the spinal canal usually varies with height and individuals. The Atlas or C1 is about 21.8 mm high, and the spinal cord makes up to 50% of the canal. Conversely, the canal in the C6 is only about 17.8 mm and the spinal cord takes the space up to 75% of the canal [1]. The most frequent stenoses in these regions are progressive changes of the disk degeneration accompanied by disk protrusion, ventral spondylophyte formation, thickening of the ligamentum flavum, and hypertrophy of the dorsal facets [1–3].

Ideally, the treatment should be targeted to assess the etiological problem. The problem is to decide whether to go with the surgery or

with conservative treatment. The objective of the surgery is decompression of the spinal cord and the neutralization of instability [1]. These can be done either by ventral resection of the vertebral disk protrusion and removal of spondylolisthesis or by dorsal removal of ligamentum flavum or hypertrophic facets. The instability after the procedure should be considered and necessitate stabilization. The methods of anterior decompression include anterior cervical discectomy and fusion (ACDF), anterior cervical corpectomy and fusion (ACCF), hybrid procedures, and cervical arthroplasty. For the methods of posterior decompression include laminoplasty or laminectomy with or without fusion [2].

Here we case a report of a 63-year-old male who came to our center with weakness over both arms and legs for 2 months before admission due to the recurrent spinal stenoses after the removal of the implant. This case report has been reported in line with the SCARE Criteria [4].

2. Case presentation

A 63-year-old male came to our center with weakness over both arms and legs for 2 months before admission. Patient felt neck pain in the last

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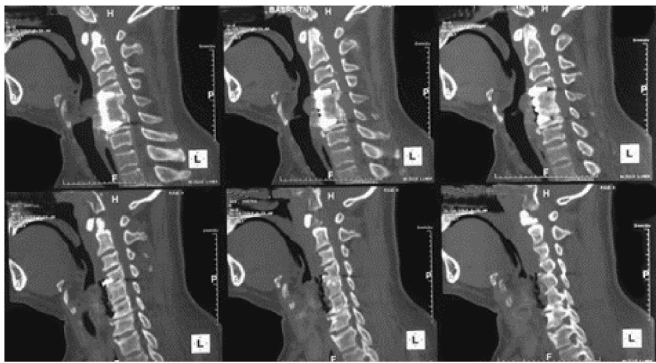


Fig. 3. Final construct confirmed by image intensifier.

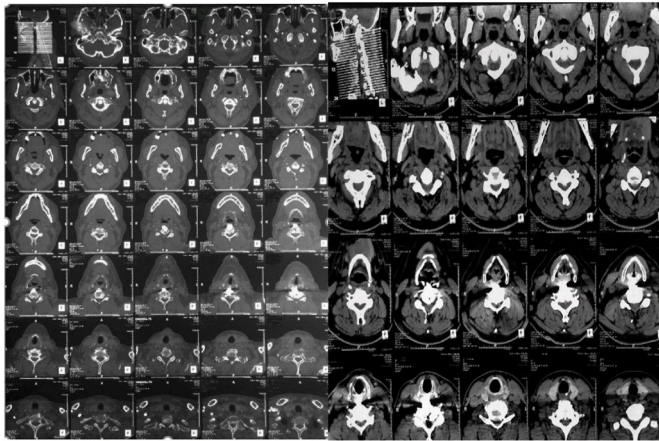


Fig. 1. Pre-operative CT

18 years. The pain was dull, not elevated by activity, non-radiating, and relieved by rest. There was no history of injury preceding the pain. At the time, there was history of weakness and diagnosed with cervical

stenoses. He then underwent an operation. For 2 months, he complained weakness in both arm and legs become again and sometimes tingling sensation. He can still walk but must walk slowly with short gait. Then he decided to use cane. Patient also felt numbness and slightly spastic on his leg. There was no disturbance in micturition and defecation.

From the physical examination no deformity was found, with tenderness VAS 2–3. The ROM of neck was limited due to the stiffness. The special test performed was positive in L’hermitte, Spurling, Hoffmann Trommner, Finger escape test, and Grip and release test. The motoric for both arms and legs was 4 according to manual muscle testing.

The first surgery was performed to remove the implant with Smith Robinson’s approach. Surgery was performed by an orthopedic surgeon. The incision was made on the scar from previous surgery. Wound was cleaned with sterile NaCl and sutured layer by layer with a drain left.

In the second surgery, the classic Smith Peterson technique was performed. C3 and C4 were confirmed with an image intensifier and subsequent C3-4 discectomy was performed. Single cage No. 5 was inserted. Second incision was done at the level of C6-7. After identification of C6-7, discectomy was performed. Insertion of the trial was completed, and the No. 5 was used. The second cage was also inserted and confirmed by an image intensifier. Wound was cleaned with sterile

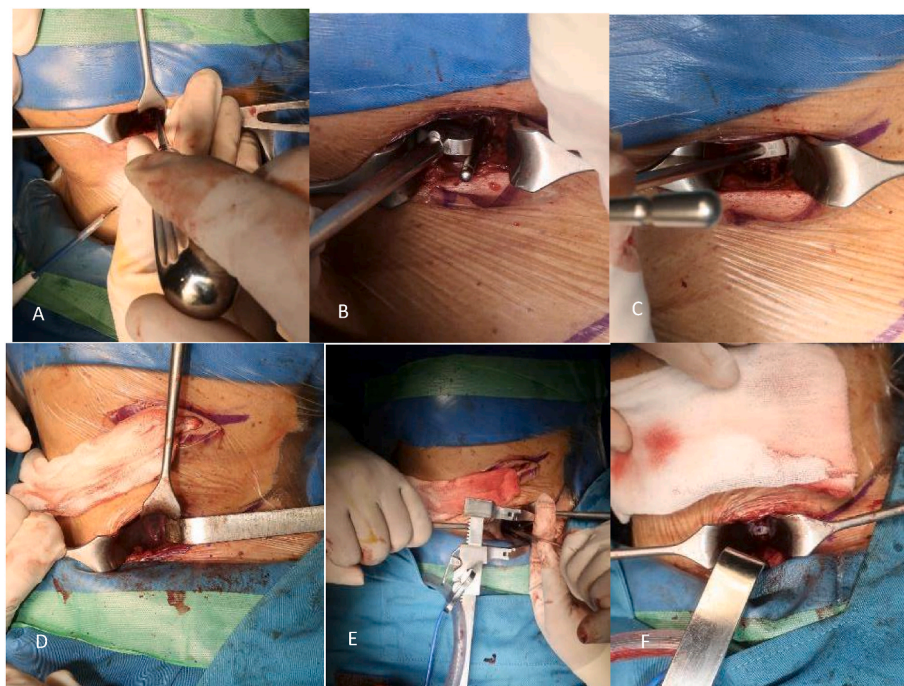


Fig. 2. Intraoperative management of the patient, (a) Discectomy of C3-4, (b) trial insertion at C3-4, (c) cage insertion, (d) exposure of C6-7, (e) discectomy of C6-7, (f) final construct of C6-7.

NaCl and sutured layer by layer with a drain left. Postoperatively, the patient was satisfied with the surgical outcome.

3. Clinical discussion

With respect to preoperative stenoses in a previously operated field, there may be different causes to be suggested. MEP and SSEP need to assess the neurological condition specifically from both a clinical and a medico-legal viewpoint. Pre-operative neuromonitoring can show potential alterations to existing cord or nerve roots, and intraoperative analyzes may help track progress after decompression. This is an argument during the patient consultation to explain the intent of the surgery and encourage him to often consider the surgery. Iatrogenic stenoses caused by a malpositioning of the screw is easily treatable by removing the screw, but the regeneration of the nerve (sequale) cannot be excluded. After reviewing and evaluating postoperative stenoses in this literature, it seems important to include some advice to prevent revision surgery that is more or less caused by the operation [5]. It seems important to analyze the possibility of instability caused by decompression and facet resection but also by a global balance study when conducting simple decompression without fusion in the lumbar spine. Intraoperatively, the use of neuromonitoring and navigational intraoperative CT scanning is a valuable tool [6].

A systematic review conducted by Yu et al. [7] showed that total disk replacement resulted in a significant increase in overall success rate and a significant decrease in the reoperation rate. For the short term and long term outcome, the cervical discectomy and fusion should be used as a standard surgery, while the total cervical disk replacement should be an alternative for patient with single-level symptomatic cervical disease [7–9]. Moreover, a study conducted by Landers et al. [10] showed that patient undergone ACDF will have improved ROM of neck and decrease in pain and headache frequency.

Cervical spondylotic myelopathy surgical treatment has focused on decompression of the spinal cord to prevent neurological deterioration and promote recovery. Cervical compression in myelopathy is mainly due to the pressure on the anterior spinal cord with ischemia and deformation of the cord through anterior herniated anterior cervical corpectomy is to maintain cervical height and restore cervical lordosis allowing and promoting bony fusion and subsequent stability. The rationale for inserting a plate over the graft and put a screw into the neighboring vertebral bodies improves durability, decreases the occurrence of graft dislodgement before it enters bony fusion and also reduces complications of pseudo-arthritis [3]. Compared with conservative treatment, surgical treatment gives greater relief of neck/arm pain, weakness, and sensory loss at 3–4 months after the surgery, with longer lasting functional improvement [11].

ACDF compared with laminoplasty should be preferred for treatment of multilevel cervical myelopathy. Even though the clinical outcome measured by JOA score are similar, ACDF associated with lower intraoperative blood loss, similar surgical duration, and complication rate compared with laminoplasty. From the radiological outcome, ACDF showed a better preserved cervical lordosis, which could affect patient's quality of life [12]. But, in comparison between ACDF and cervical disc arthroplasty (CDA) for cervical degenerative disc disease, CDA is more superior in terms of improving clinical outcomes, preserving range of motions, adjacent segment disease incidence, and reoperation rate at long-term follow up [13]. A study conducted by Wang et al. [14] said that both ACDF and ACCF are good in clinical outcomes, but ACDF is better in radiographic outcomes and total complications such as injury to spinal cord or roots, excessive bleeding, and graft displacement or extrusion for the treatment of multi-level cervical myelopathy.

Controversy persists as to how best to provide support for anterior columns following removal of bones. Traditionally, the use of autologous tri-cortical iliac bone has been considered the gold standard of graft material, but the morbidity of the donor site is a concern. Allograft bone reduces harvesting morbidity, but the fusion rate was not comparable

with autograft (allograft strut grafts combined with anterior plates produced fusion rates of up to 86.6%). Therefore, the use of regional autograft bone would be preferable to avoid morbidity of the donor site and to facilitate fusion as much as possible; in these cases, titanium mesh and/or titanium expanding cages allow the use of local autografts for graft material in cervical corpectomy surgery, thus providing good mechanical aid. Expanding cages also provide theoretical restoration of physiological lordosis with a strong diversion. Complications of titanium mesh and expanding cages with autografts and anterior plates can involve subsidence and kyphotic deformity; any over-distraction maneuvers should be avoided while using these devices [3]. In summary, our case presentation showed that ACDF is associated with lower complication rate and better clinical outcomes, therefore suitable for treatment of recurrent cervical spinal stenoses.

4. Conclusion

ACDF is one of the viable methods for the treatment of the cervical stenoses. Compared with other methods of treatment, ACDF has a lower complication rate and better clinical outcomes.

Ethical approval

Ethical approval clearance was not required in the treatment of the patient in this report.

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Author contributions

Singkat Dohar AL Tobing contributes in the study concept or design, data collection, analysis and interpretation, oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.

Aryo Winartomo contributes in the study concept or design, data collection, writing the paper, analysis and interpretation.

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Consent

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Declaration of competing interest

The authors declare that there is no conflict of interest regarding publication of this paper.

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