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Case Report

Six-year follow-up of three-level prestige LP cervical disc replacement: a case report

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Abstract: Three-level Cervical Disc Replacement (CDR) is very rare and has been little reported. Many clinical surgeons are worrying about its efficacy and safety. Considering the little knowledge of three-level CDR, we present this special case of three-level Prestige LP CDR with a six-year follow-up duration. This case reports a 44-year-old female patient presenting multilevel cervical disc herniation with persisting neurological signs. Before surgery she had severe neck pain, shoulders pain and left side arm pain especially in the C5, C6 and C7 roots distribution. The visual analogue scale (VAS) for neck was 7 and the VAS for left arm was 8. SF-36 physical and psychological score was 28 and 36, respectively. The neck disability index (NDI) was 43. The surgery was performedvia a classic right Smith-Robinson approach after induction of general anesthesia in April 16, 2009. The six-year postoperative X-rays showed the good position of the implant, a satisfying disc height and cervical lordosis. The overall results of this patient of three-level Prestige LP CDR are very good even three-level CDR remains controversial about its efficacy and safety. The selection of suitable surgical candidates and determination of valid indications for three-level CDR is essential for a good outcome. The preliminary results indicate that three-level CDR is effective and safe for the treatment of multi-level cervical spondylosis, however, larger studies with longer follow-up duration are warranted.

Keywords: Three-level, cervical disc replacement, Prestige LP, CDR

Introduction

Compared with anterior cervical discectomy and fusion (ACDF), single level cervical disc replacement (CDR) has shown satisfactory results with the potential advantages of preservation of motion, possible decreased rate of adjacent segment degeneration, reducedpostoperative dysphagia and less work stoppage. CDR is also reported to be a safe, effective, and statistically superior alternative to ACDF for the treatment of degenerative disc disease at 2 contiguous cervical levels. Bae et al. reported no statistical differences between one and two-level CDR groups in clinical outcomes, overall complication rates, and subsequent surgery rates [1]. Greiner-Perth et al. reported 2 cases of three-level CDR (Discover, DePuy Spine, Raynham, MA, USA) with a limited 12 months follow-up [2]. Three-level Cervical Disc Replacement is very rare and has been little reported. Many clinical surgeons are worrying about its efficacy and safety. Considering the little knowledge of three-level CDR, we present this special case of three-level Prestige LP CDR with a six-year follow-up duration to share our experience and to explore the safety and effectiveness of three-level CDR.

Case report

A 44-year-old female patient presenting multilevel cervical disc herniation with persisting neurological signs was treated in April 2009. She had paresthesia, decreased muscle strength and positive pathological reflex in her left upper extremity. The neck, shoulders and left arm pain had worsened in the last month despite a 4-week intensive conservative treatment. Before surgery she had severe neck pain, shoulders pain and left side arm pain especially in the C5, C6 and C7 roots distribution. The visual analogue scale (VAS) for neck was 7 and VAS for left arm was 8. SF-36 physical and psychological score was 28 and 36, respectively. The neck disability index (NDI) was 43. Dynamic flexion and extension X-rays showed the segmental movement well preserved (Range of

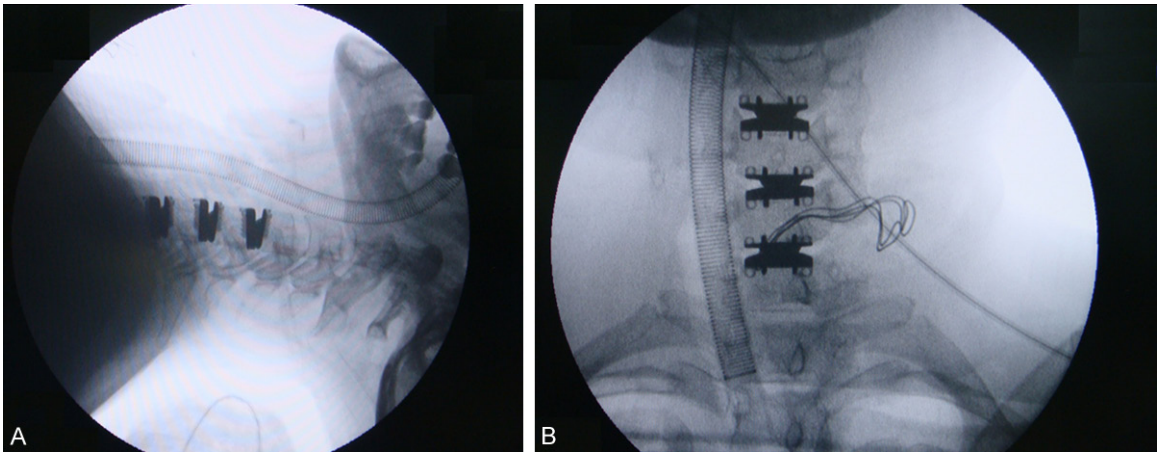

Figure 1. Intraoperative fluoroscopy confirmed the good position and appropriate size of implant. Lateral view (A) andanterior-posteriorview (B).

motion C2-C7 = 31°). Computed tomography scan showed no bony spinal stenosis. Magnetic resonance imaging (MRI) confirmed multilevel cervical disc herniation (C4/5, C5/6, C6/7), compromising the neural foramen at the left C4-C7 nerve roots seriously.

The surgery was performed on a classic right Smith-Robinson approach by a very experienced surgeon after induction of general anesthesiain April 16, 2009. The patient was carefully placed supine on a radiolucent operating table. A horizontal right side skin incision (about 5 cm long, at the level of C5/6) was performed. The discs of C4/5, C5/6 and C6/7 were removed and posterior longitudinal ligament along with anterior, posterior and lateral ostophytes were resected. Meticulous hemostasis was used throughout this procedure to diminish the blood loss and reduce the risk of heterotopic ossification. Preparation of the endplates for CDR was accomplished in the standard technique and the subchondral end-plates are preserved for the prevention of implant subsidence. After complete decompression and endplate preparation of three segments, prostheses of appropriate size were implanted from the cephalic to the caudal end under radiographic monitoring (**Figure 1**).

The patient was followed at 1, 3, 6, 12, 24, 48, 72 months after surgery. Postoperative complications such as hoarseness, dysphagia, cerebrospinal fluid leakage, were not found. The six-year postoperative X-rays (**Figure 2**) showed the good position of the implant, a satisfying disc height and cervical lordosis, preserved range of motion in dynamic view. The main clinical outcomes are summarized in **Table 1**.

Discussion

A recent meta-analysis based on a series of prospective randomized controlled trials demonstrated CDR is superior to ACDF with favourable functional outcomes, fewer adverse events, and fewer secondary surgical procedures [3]. Several studies have reported the application of artificial cervical disc in the treatment of multilevel cervical discdiseases [1, 4]. However, CDR is not entirely perfect: a recent cost-effectiveness analysis concluded that anterior cervical discectomy without fusion is a cost-effective alternative to ACDF and CDR in patients with single-level cervical disc disease [5]. Three-level CDR is very rare and many clinical surgeons are worrying about its efficacy and safety. To the best of our knowledge, this is the first report of three-level Prestige LP CDR with a long follow-up duration. The overall results of this case are very good. A three-level cervical disc replacement can be safely and successfully performed via a classic right Smith-Robinson approach. Implanting of the artificial cervical discs after adequate decompression in three levels is recommended in such a case. Meticulous hemostasis is also recommended throughout the procedure to diminish the blood loss and reduce the risk of heterotopic ossification.

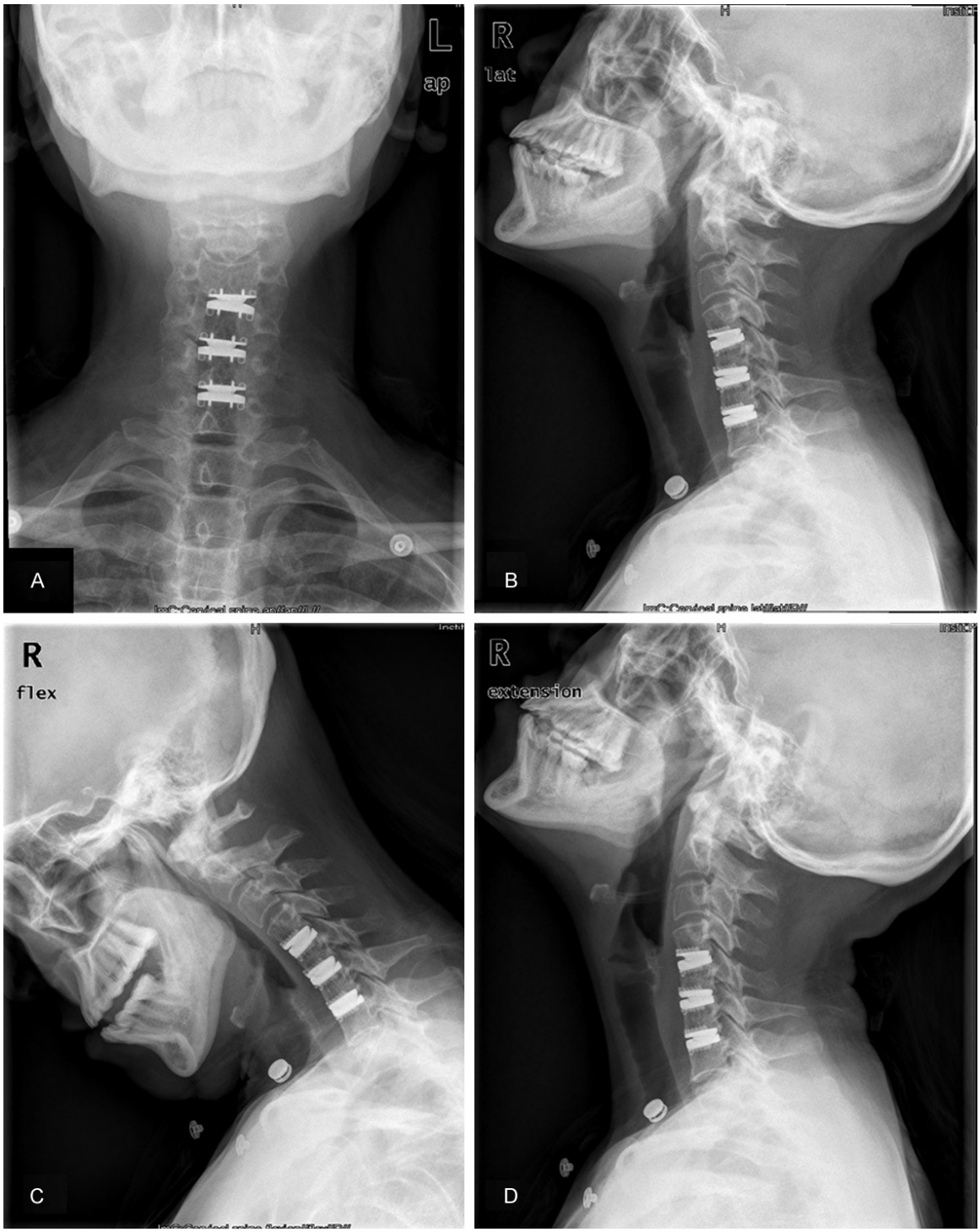

Figure 2. Six years postoperative X-rays showed the good position of the implant, preserved range of motion in dynamic view, a satisfying disc height and cervical lordosis. Anterior-posteriorview (A), Lateral view (B), Flexion view (C) and Extension view (D).

Conclusion

The overall six-year follow-up results of this case of three-level Prestige LP CDR are very good even three-level CDR remains controversial about its efficacy and safety. The selection of suitable surgical candidates and determination of valid indications for three-level CDR is

Table 1. The main clinical outcomes of this three-level prestige LP cervical disc replacement patient

Time	NDI	VAS for neck	VAS for arm	SF-36 Physical score	SF-36 Psychological score
Preoperative	43	8	7	28	36
One week	22	3	5	39	49
One month	12	2	1	46	54
Three months	7	1	0	48	53
Six months	5	0	0	48	52
One year	2	0	0	46	53
Two years	1	0	0	48	52
Four years	1	0	0	48	52
Six years	1	0	0	48	53

NDI, neck disability index; VAS, visual analogue scale.

essential for a good outcome. The preliminary results indicate that three-level CDR is effective and safe for the treatment of multi-level cervical spondylosis; however, larger studies with longer follow-up duration are warranted.

Disclosure of conflict of interest

None.

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