



## Case Report

# Management of two patients with dropped head syndrome utilizing anterior-posterior cervical surgery

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## ABSTRACT

**Background:** Two elderly patients with dropped head syndromes (DHS) were successfully treated with circumferential cervical surgery.

**Case Description:** The two patients, respectively, 72 and 53 years of age, both underwent two-staged surgical procedures. The first surgery included the posterior placement of bilateral pedicle screws with multilevel facetectomies, followed by multilevel anterior cervical discectomy/fusion and posterior rod fixation.

**Conclusion:** Circumferential decompression/fusion successfully addressed chin on chest deformity in two older patients.

**Keywords:** Anterior fixation, Dropped head syndrome, Laminoplasty, Posterior fixation, Surgery

## INTRODUCTION

Dropped head syndrome (DHS) is a chin-on-chest deformity attributed to a noninflammatory myopathy of the cervical paraspinal muscles resulting in weakness of the cervical extensor musculature.<sup>[3,10]</sup> Conservative nonsurgical treatment is rarely successful. Rather, most patients warrant surgical correction (i.e., circumferential 360 degree decompression/fusion).<sup>[6,7]</sup> Here, we present two older patients with DHS who were successfully treated with circumferential cervical surgery.

## CASE PRESENTATION

### Case 1

A 72-year-old female presented with a progressive DHS syndrome and mild myelopathy (i.e., bilateral C5-C7 hyperreflexia). X-rays showed DHS, while the magnetic resonance images documented posterior compression at C-2 to C-3, and stenosis from C-5 to C-7 [Figure 1]. For progressive DHS, the patient underwent posterior placement of pedicle screws C2-C7 and C4-C5 facetectomy, followed by anterior cervical discectomy/fusion from C2-C3 to C6-C7 and posterior C2-C7 rod/pedicle screw fusion [Table 1]. The 5-year postoperative X-rays showed resolution of the DHS and the patient remained neurologically intact [Figure 2].

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**Case 2**

A 53-year-old male presented without myelopathy. Preoperative X-rays demonstrated DHS, while the MR showed C-5 to C-6 cord compression [Figure 3]. The patient underwent circumferential surgery for DHS; bilateral facetectomies C3-C7 with posterior pedicle screw placement, followed by C3-C4 to C6-C7 ACDF and posterior rod/screw placement C3-C7 and laminoplasty C3-C6 [Table 1]. Six

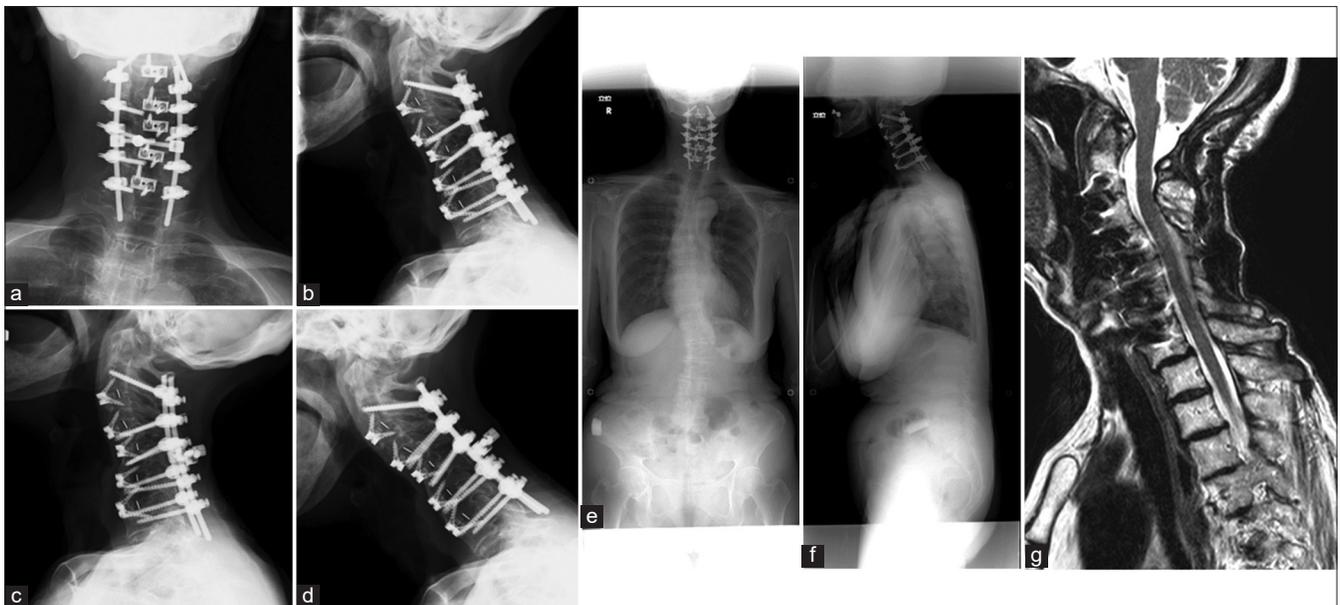
years postoperatively, the X-rays showed continued stability, while the patient remained clinically/neurologically intact [Figure 4].

**DISCUSSION**

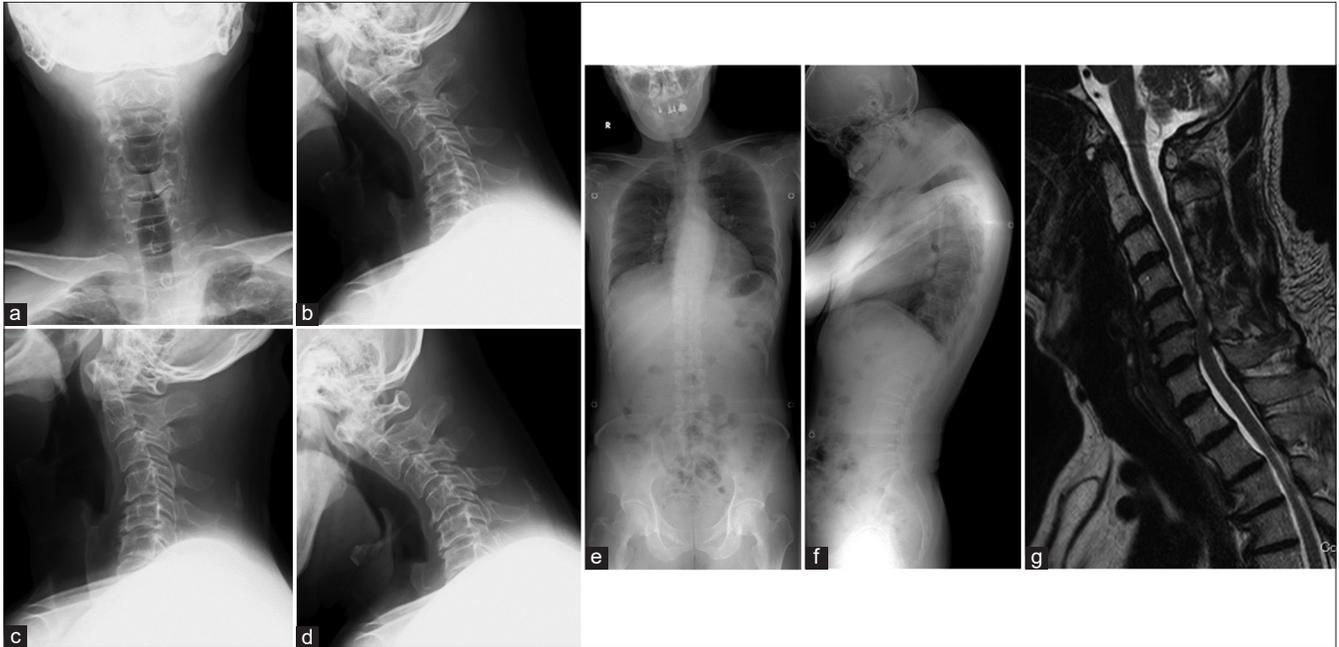
DHS can be classified into three groups based on preoperative radiological parameters; Type 1 (SVA  $\leq 0$  mm



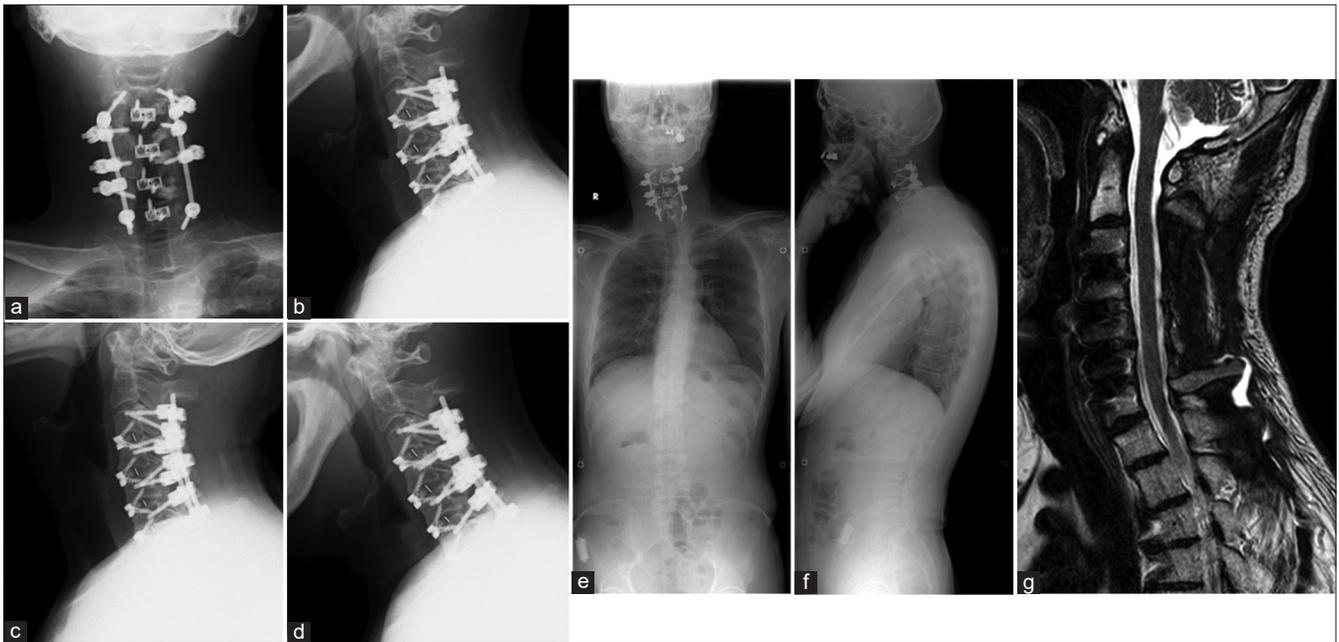
**Figure 1:** Preoperative radiological findings (Case 1) (a-f). The midline sagittal preoperative cervical MR documented a tortuous/compressed cord at the C2 to C3 level without myelomalacia and C-5 to C-7 stenosis (g).



**Figure 2:** Postoperative radiological findings (Case 1) (a-f). After 360° surgery, the postoperative MRI documented correction of the preoperative cervical deformity (g).



**Figure 3:** Preoperative radiological findings (Case 2) (a-f). The preoperative midline sagittal MR showed both anterior and posterior cord compression at the C5-C6 level (g).



**Figure 4:** Postoperative radiological findings (Case 2) (a-f). Following 360-degree circumferential decompression/fusion, including a C3-C6 laminectomy, the postoperative sagittal MR documented spinal cord decompression (g).

and  $PI-LL \leq 10^\circ$ ), Type 2 ( $SVA > 0$  mm and  $PI-LL \leq 10^\circ$ ), and Type 3 ( $PI-LL > 10^\circ$ ).<sup>[5]</sup> Several surgical strategies for DHS have been reported including; posterior multilevel fixation or combined anterior and posterior cervical fixation [Table 2].<sup>[1,2,4,7-9]</sup> In our two cases of DHS, we chose

first to perform posterior cervical facetectomies with pedicle screw application, followed by multilevel ACDF with posterior rod/pedicle/screw fusion. The final posterior fixation was accompanied in the second case by an additional laminoplasty.

**Table 1:** X-ray, clinical, and surgical findings for two patients with DHS.

	Case 1 Preoperative/ Postoperative	Case 2 Preoperative/ Postoperative
C2–C7 lordosis	–31°/7°	–34°/8°
EAM-C7	64.8 mm/19.8 mm	73.2 mm/–42.3 mm
SVA	58.7 mm/51.6 mm	64.5 mm/37.4 mm
T1-slope	19°/26°	23°/20°
T1-slope – C2-7 lordosis mismatch	50°/19°	57°/12°
PI-LL	11°/13°	–19°/–17°
JOA score	14/14.5	15.5/17
CMEQ score	65/35	50/100
VAS	70/70	45/50
First Surgery	Bilateral facetectomy (C-4/C-5) Bilateral pedicle screws (C-2 - C-7 except C-3)	Bilateral facetectomy (C-3 to C-7) Bilateral pedicle screws (C-3 to C-7)
Second Surgery	ACDF (C-2/C-3 to C-6/C-7) Anterior correction and posterior fixation with rod placement	ACDF (C-3/C-4 to C-6/C-7) Anterior correction and posterior fixation with rod placement LAP (C-3 to C-6)

EMA: External acoustic meatus, SVA: Sagittal vertical axis, PI: Pelvic incidence, LL: Lumbar lordosis, JOA: Japan Orthopedic Association, CMEQ: Cervical myelopathy evaluation questionnaire, VAS: Visual analog scale-pain in neck and shoulders, ACDF: Anterior cervical discectomy/fusion, LAP: Cervical laminoplasty

**Table 2:** Summary of surgical strategy in the previous cases from the literature.

	Patients (age/sex)	Surgical strategy
Bronson <i>et al.</i> <sup>[1]</sup>	One Patient: 64 (years), male	<b>Anterior approach (first operation)</b> ACDF (C-3/C-4, C-4/C-5, C-6/C-7) Bilateral partial sternocleidomastoid release <b>Posterior approach (second operation)</b> Fixation (C-2 to T-10) Laminectomy (C-4 to C-5) Osteotomy (C-4 to C-5)

(Contd...)

**Table 2:** (Continued)

	Patients (age/sex)	Surgical strategy
Gerling <i>et al.</i> <sup>[2]</sup>	Eight Patients	Anterior release (C-2 to C-7) Posterior fusion (C-2 to T-3) Anterior release (C-3 to T-2) Posterior fusion (C-2 to T-5) Anterior release (C-5 to C-6) Posterior fixation (C-2 to T-3) Anterior release (C-2 to C-5) Posterior fusion (C-2 to T-3) Posterior fusion (C-2 to T-1) Posterior fusion (C-2 to T-3) Posterior fusion (C-2 to T-4) Posterior fusion (C2-T5)
Koda <i>et al.</i> <sup>[4]</sup>	One Patient: 72 (years), female	Posterior fusion (C-2 to T-4) Laminectomy (C-3 to C-6)
Koda <i>et al.</i> <sup>[4]</sup>	One Patient: 64 (years), female	Laminectomy (C3-C6) ACDF (C-4/C-5 to C-5/C-6) Posterior fixation (C-2 to T-6) Posterior fusion (C-2 to T-2)
Petheram <i>et al.</i> <sup>[7]</sup>	One Patient: 79 (years), female	Posterior fusion (C-2 to T-2)
Rahimizadeh <i>et al.</i> <sup>[8]</sup>	One Patient: 67 (years), male	<b>First operation</b> ACDF (C-3/C-4 to C-5/C-6) Laminectomy (C-3 to C-6) Posterior fixation (C-2 to C-7) <b>Second operation</b> Extended posterior fixation (C-2 to T-4) Posterior fusion (C-2 to T-2)
Sharan <i>et al.</i> <sup>[9]</sup>	Two Patients	Anterior fixation (C-4 to C-6 and T-1 to T-2) Posterior fusion (C-2 to T-2)

y: Years, N.A.: Not available, ACDF: Anterior cervical discectomy/fusion

## CONCLUSION

Here, we corrected the DHS syndrome in two older patients utilizing a combined circumferential 360 degree decompression/fusion.

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## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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