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Effect of Videofluoroscopic-guided UES ballooning for dysphagia associated with C6 subsidence in cervical cord injured patient: a case report

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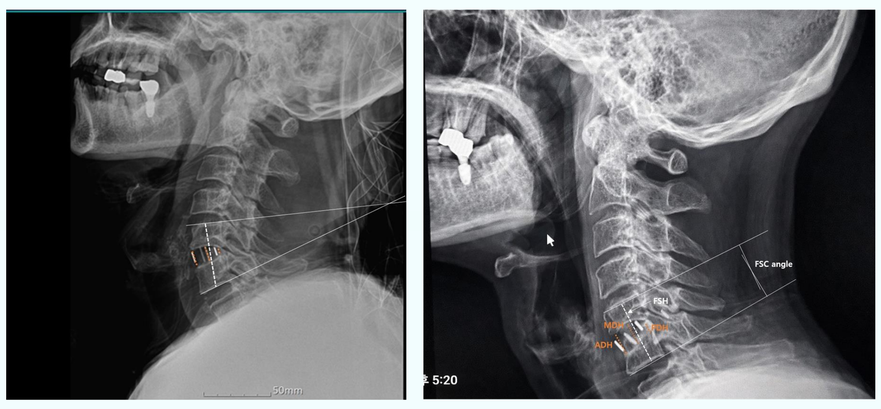
INTRODUCTION

- Dysphagia is a common complication in patients with cervical spinal cord injury (SCI) and may be exacerbated by postoperative anatomical alterations following anterior cervical spine surgery. In particular, cervical cage subsidence can influence pharyngoesophageal mechanics and contribute to upper esophageal sphincter (UES) dysfunction, leading to aspiration and prolonged dependence on non-oral feeding. However, the therapeutic role of UES balloon dilatation in dysphagia associated with postoperative cervical subsidence has never been reported.

CASE REPORT

Subject

- A case of a tetraplegic patient with traumatic cervical SCI at the C5/6 motor level (AIS grade B) who underwent anterior cervical discectomy and fusion.
- The postoperative course: progressive subsidence at the C6 vertebral level.
- Radiographic evaluation demonstrated a marked reduction in fused segment height (from 41.5 mm to 35.8 mm) and fused segmental Cobb angle (from 19.7° to 6.0°) over an 8-month period (Fig 1A, B).
- During this time, the patient developed recurrent aspiration pneumonia and severe dysphagia, necessitating nasogastric tube feeding and total parenteral nutrition.

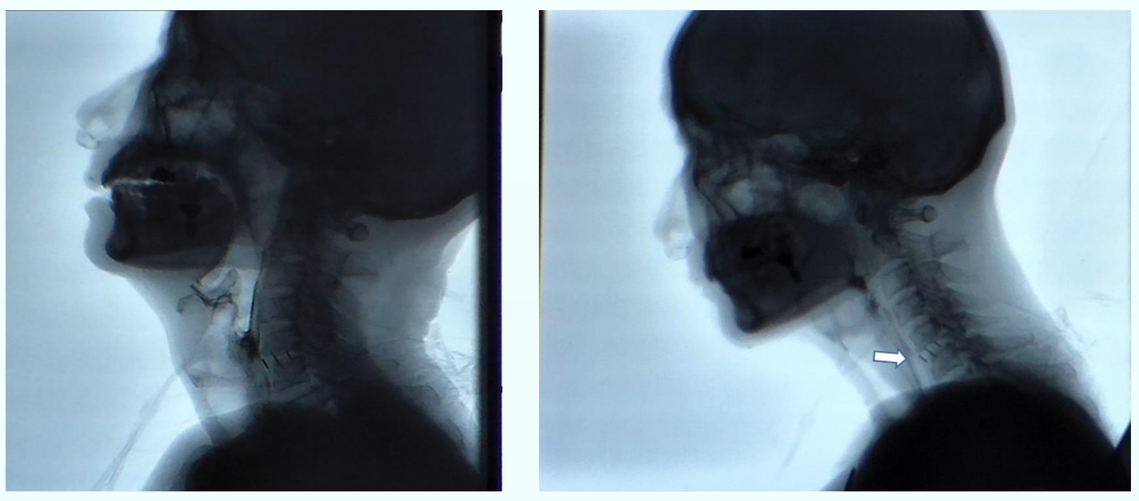


(A) (B)

Figure 1. Immediate postoperative lateral cervical radiograph illustrating the measurement of fused segment height (FSH), anterior, middle, and posterior disc heights, and the fused segmental Cobb (FSC) angle. FSH was defined as the distance between the midpoints of the superior endplate of the cranial vertebra and the inferior endplate of the caudal vertebra at the fused segment. The FSC angle was measured to assess segmental alignment (A). Lateral cervical radiograph obtained 8 months postoperatively demonstrates cage subsidence with decreased FSH and reduced FSC angle, indicating segmental kyphotic change (B)

Videofluoroscopic swallowing study

- Videofluoroscopic swallowing study (VFSS) revealed a cricopharyngeal bar, reduced laryngeal elevation, increased piriform residues, shortened cricopharyngeal opening duration (Fig 2A, B). These findings indicated combined pharyngeal dysfunction and UES dysfunction.
- The UES dysfunction was presumed to be secondary to postoperative cervical subsidence, which reduced cervical lordosis and promoted anterior protrusion of the implanted device, thereby mechanically compromising the UES passage.



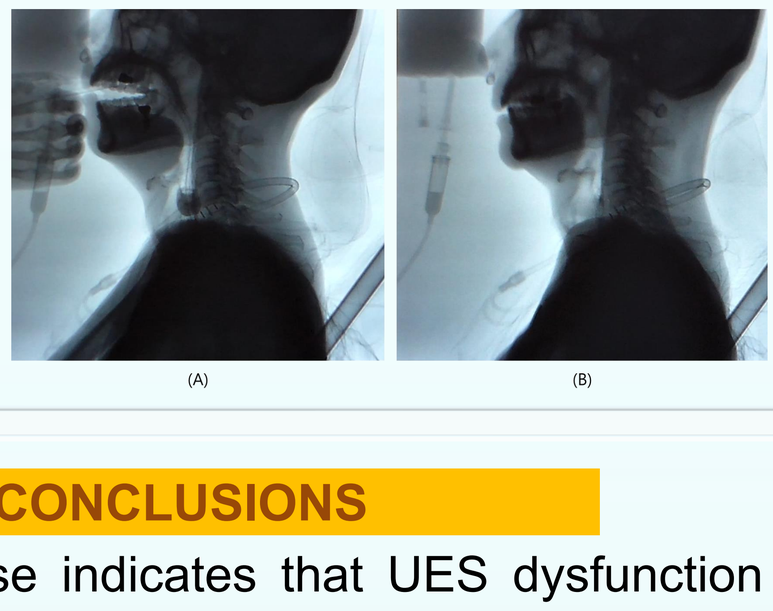
(A) (B)

Figure 2. Lateral-view videofluoroscopic swallowing study (VFSS) images obtained before VFSS-guided upper esophageal sphincter (UES) balloon dilatation. During thick liquid swallowing, prominent after-swallow residue is observed predominantly in the piriform sinuses compared with the vallecular space, consistent with UES dysfunction (A). During liquid swallowing, a cricopharyngeal bar (white arrow) is observed, indicating underlying UES dysfunction (B).

RESULTS

Videofluoroscopic-guided ballooning intervention and results

- Swallowing rehabilitation therapy was initiated based on VFSS findings. After stabilization of pulmonary infection, videofluoroscopic-guided UES balloon dilatation was performed three times at one-week intervals (Fig 3A).
- Follow-up VFSS demonstrated improved clearance of pharyngeal residue with multiple swallows, and a marked reduction in aspiration severity (Fig 3B). The patient successfully transitioned to full oral feeding and discontinued tube feeding.
- During an 8-month follow-up period, oral intake was maintained without recurrence of aspiration pneumonia while comprehensive swallowing and spinal cord rehabilitation.



(A) (B)

Figure 3. Fluoroscopic image during VFSS-guided UES balloon dilatation demonstrating balloon expansion at the level of the cricopharyngeal segment (A). Post-intervention lateral-view videofluoroscopic swallowing study showing improved UES opening and a marked reduction in post-swallow piriform sinus residue during thick liquid swallowing (B).

CONCLUSIONS

- This case indicates that UES dysfunction secondary to postoperative cervical subsidence may be a key contributor to dysphagia following cervical spinal cord injury. UES balloon dilatation appears to be a safe and effective option for improving UES function and enabling the resumption of oral intake in selected patients after anterior cervical spine surgery.
- In addition to treatment, careful surgical technique during anterior cervical discectomy and fusion is important, including appropriate cage sizing, preservation of vertebral endplates, and symmetrical cage placement. Postoperative cervical immobilization and maintenance of cervical lordosis may further reduce the risk of cage subsidence and related swallowing complications.