Loss Of Swallowing Reflex Lasting For 42 Days After Anterior Cervical Decompression And Fixation Done For Traumatic Cervical Spine Injury: A Case Report

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Abstract

Case report: Post-operative dysphagia is a common complication seen after anterior approach to cervical spine, which is usually mild and recovers well over a period of four weeks. We present a rare case of severe dysphagia with inability to swallow, lasting 6 weeks after anterior cervical decompression and fixation, in a case of post traumatic cervical spine injury, which was treated conservatively. The causes, types and management strategies are discussed with aim to familiarize the surgeon with the complication.

Keywords: Anterior Cervical Spine, Dysphagia, Swallowing reflex

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Introduction

Smith Robinson approach to anterior cervical spine surgery, described more than 50 years ago is still the most commonly used approach for anterior cervical spine procedures [1-4]. It is easy to use, less time consuming, uses inter-muscular plane, gives wide exposure up to 3 disc spaces, and is associated with low blood loss and lower complication rates [4,5]. Most common complaint after this approach is dysphagia, reported in up to 69% cases, caused by medial retraction of esophagus along with trachea to expose the cervical vertebra [6]. It may be due to pharyngeal/esophageal wall ischemia, edema, hematoma, infection, injury to pharyngeal plexus, superior laryngeal nerve or recurrent laryngeal nerve, scar formation around cervical plates or bone graft dislodgement [7]. These patients feel pain while swallowing, which can be classified as mild, moderate and severe according to modified Bazaz Score [8]. Fortunately, this dysphagia is a transient phenomenon, which recovers well within 4 weeks and debilitating dysphagia is relatively uncommon [6,8]. We here present such a case of post-operative severe dysphagia without any structural damage lasting for 42 days, presenting with complete loss of swallowing function, not able to swallow his own saliva, who was fed with the help of Ryles tube and was under constant threat of aspiration, but recovered well with conservative treatment alone.

Case Report

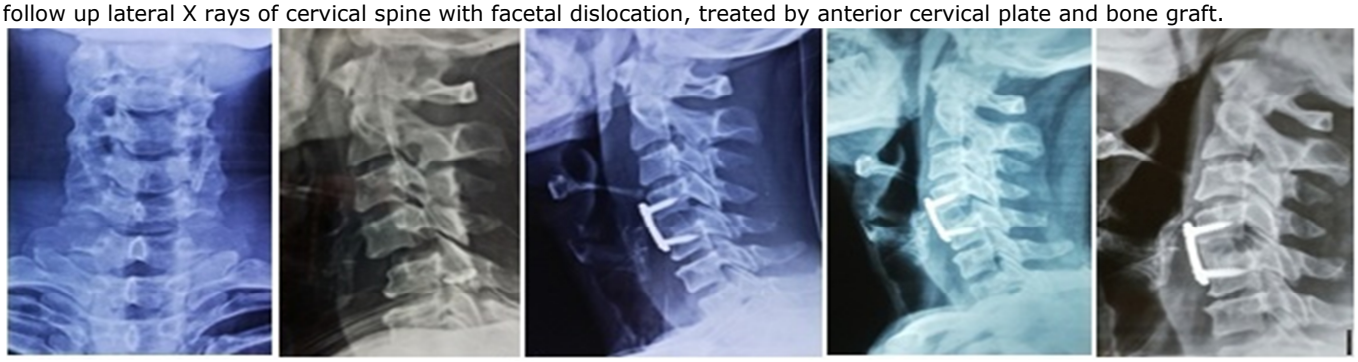
A 55-year-old male patient sustained trauma due to road traffic accident and was referred to us, with complaints of severe neck pain and weakness in all 4 limbs. Radiographs of cervical spine showed C4-C5 facetal dislocation left side, which was confirmed on MR scan of cervical spine. Patient was planned for surgery after investigation and anesthesia fitness.

He was operated via anterior Smith-Robinson approach in supine position under general anesthesia. C4-5 disectomy was done followed

by reduction of facetal dislocation by vertebral body distraction. End plate preparation was done by curved curette and autologous tri-cortical bone graft was inserted between C4-5 vertebral bodies. Four-hole anterior cervical plate was applied between C4 and C5 above the bone-graft anteriorly (fig 1). Intra-operative period was uneventful and patient was shifted out of OT to the ICU.

Post-operatively, patient developed severe dysphagia and he was not able to swallow anything. He was spitting out his own saliva. ENT examination was done; all cranial nerves and laryngeal nerves were assessed and found to be normal. Direct and indirect laryngoscopy was also found to be normal. Chest X rays showed no mediastinal widening. Cervical spine X rays showed well reduced cervical spine with bone graft and plate in place (fig 1). Esophagoscopy was done to rule out any esophageal perforation/injury. Barium swallow study could not be done because patient was unable to swallow the liquid barium. All relevant mechanical causes of severe dysphagia were ruled out. MRI cervical spine & brain was ordered to assess for any other pathology which could hamper swallowing, but it came out to be normal except for mural thickening of laryngopharynx & upper most part of esophagus with resultant luminal attenuation (fig 2).

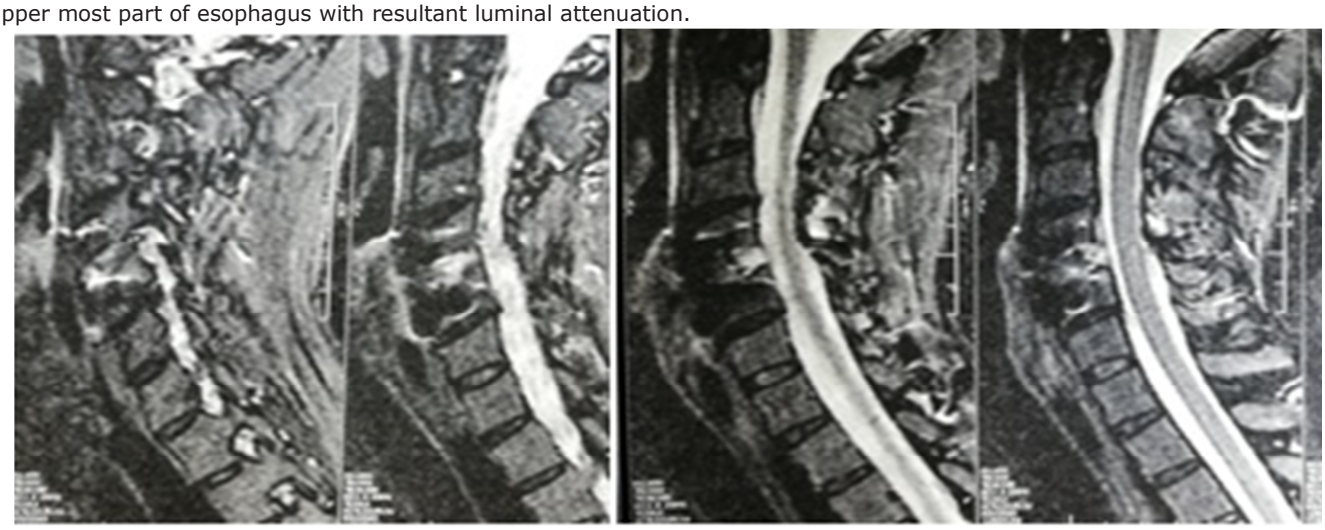
Fig 1: Pre-op antero-posterior (a) and lateral (b) and immediate post-operative lateral (c), 3 month (d) and 6 months (e) follow up lateral X rays of cervical spine with facetal dislocation, treated by anterior cervical plate and bone graft.



a b c d e

The patient was started on steroids and anti-inflammatory medicines along with a Ryles tube for his feeding. Patient was discharged with Ryles tube after stitch removal at two weeks, with improved neurology. Patient reported back to us after 6 weeks as he was able to swallow liquid food. Still the Ryles tube was kept in situ for 2 more days and asked him to swallow semi solid and mashed solid food with the tube. On 44th post-operative day we removed the tube. After that patient was having good swallowing function and had no problem till 6 months i.e. at last follow up (Fig 2).

Fig 2: Post-operative coronal section (a to d) of cervical spine MRI showing edematous mural thickening of laryngopharynx & upper most part of esophagus with resultant luminal attenuation.



a b c d

Discussion

Dysphagia is impairment in the speed and/or safe delivery of food or saliva from the mouth to esophagus increasing risk of aspiration. Bazaz graded dysphagia as none, mild, moderate or severe. Grade "none" indicates no swallowing difficulty with either liquids or solids, "mild" indicated no difficulty with liquids and only rare difficulty with solids "moderate" indicated no (or rare) difficulty with liquids and occasional difficulty with specific solids such as bread or steak and "severe" indicates rare (or occasional) difficulty with liquids and frequent difficulty with most solids [8]. Our case had severe functional dysphagia following anterior cervical spine fixation with complete loss of swallowing of both solid and liquid, which made him to sit all the time and spit out his saliva frequently to prevent aspiration.

Dysphagia can be caused due to abnormality in neural control of structures involved in swallowing process [9]. Swallowing reflex is divided into three phases - oral, pharyngeal, and esophageal. Oral phase starts with entry of the food into oral cavity and controlled by complex coordination of the soft palate, tongue, salivary glands, and facial muscles which are innervated by glossopharyngeal, hypoglossal and facial nerves. Pharyngeal phase involves involuntary coordination of laryngeal elevation, inversion of epiglottis and closure of vocal folds to prevent entry of food into airway, contractions from superior, middle, and inferior pharyngeal muscles to clear the food, with momentarily stoppage of respiration during this phase. Superior and recurrent laryngeal nerves play important role in this phase. The esophageal phase is completely involuntary and occurs through the coordinated peristalsis of the esophageal musculature controlled by myenteric plexus of Auerbach triggered by vagus nerve for this esophageal contraction [10].

The nerves involved in swallowing are at risk during anterior cervical spine surgeries, and hence postoperative dysphagia is a common complication associated with anterior cervical spine surgery [11-15]. Glossopharyngeal and hypoglossal nerves are vulnerable in surgeries involving C3 level or above. Superior laryngeal nerve is at risk in surgeries at C3-C4 level. Recurrent laryngeal nerve is at higher risk in surgeries at C6 level or below. The vagus nerve is vulnerable to retraction injury at any sub-axial cervical levels. Some surgeons consider postoperative dysphagia as an inevitable result of the surgery rather than a surgical complication [11,16].

Mild to moderate dysphagia is transient and recovers well within 4 weeks. But severe dysphagia after anterior cervical spine surgery requires urgent evaluation to exclude any potentially reversible surgical complications [17]. Patient history, physical examination, X-ray, direct or indirect laryngoscopy, and video radiographic swallow evaluation (VSE) are the primary modalities for evaluating oropharyngeal dysphagia [18]. History should include the onset, duration, severity and progression of the condition. Physical examination includes assessment of oral sensation, oral reflexes, and postural abnormalities, as well as motor assessment of face, lips, tongue, palate and larynx, level of arousal, ability to follow directions, and saliva management. Neurologic examination should include cranial nerve testing, especially the nerves involved in swallowing (the sensory components of cranial nerves V, IX, and X, and the motor components of cranial nerves V, VII, X, XI, and XII). Plain cervical radiographs rule out structurally induced dysphagia, caused by bone graft dislodgement, retropharyngeal abscess, postoperative edema or hematoma [13,17]. No identifiable neural or structural damage could be found in our case on clinical and neurological examination, cervical spine radiograph, direct or indirect laryngoscopy, and on MRI scan.

Goals of treatment in dysphagia are to maximize food transfer and prevent aspiration [19,20]. This includes various compensatory strategies for facilitating the safe and effective passage of bolus material like: (1) diet modifications: controlling bolus size or texture, avoiding certain foods; (2) heightening sensory input prior to or during swallowing; (3) modified swallowing maneuvers like applying voluntary control to swallow (breath

holding, effortful swallow); (4) protecting the airway with postural adjustments to reduce risk of aspiration (e.g., chin tuck, head tilt, head rotation, head lift, lying down); and (5) doing exercises to strengthen weak facial muscles, to improve range of oral or pharyngeal structural movement, and/or to improve coordination [17]. If the patient is still unable to swallow safely despite these rehabilitation strategies, then medical or surgical intervention may be necessary. Vocal cord medialization and devices such as palatal lifts can also be used to reduce aspiration risk. A temporary feeding tube may be needed in cases where aspiration risk cannot be reduced and/ or nutritional needs cannot be met [17].

We managed our patient conservatively with above modifications and temporary naso-gastric tube placement and he recovered fully after 6 weeks. Prognosis of dysphagia depends on complication which may develop from the condition, including pneumonia, dehydration, and malnutrition.

Conclusion

Postoperative dysphagia is a common complication associated with anterior cervical spine surgery, which is usually a mild and transient phenomenon, which recovers well. But if the condition is severe, it necessitates proper examination and investigation to rule out identifiable neural or structural cause.

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