The Journal of Laryngology and Otology
November 1991, Vol. **105**, pp. 964–965

Styloid apparatus anomaly causing dysphagia

S. E. J. Leighton, F.R.C.S., H. B. Whittet, F.R.C.S., S. Golding, F.R.C.R.,* A. P. Freeland, F.R.C.S.
(Oxford)

Abstract

An unusual case of dysphagia due to anomalous styloid apparatus anatomy is presented. Clinical and radiological findings are documented. Variations in anatomy and clinical syndromes are discussed together with management.

Introduction

Although variations in the anatomy of the styloid apparatus are common, the recognition of clinical symptoms arising from such anomalies is often difficult. A variety of clinical presentations has been described. Pain in the distribution of the glossopharyngeal and vagus nerves is the symptom most associated with the styloid process and the diagnosis of this is dependent upon a characteristic history. Such symptoms may be reproduced by palpation of the styloid process deep to the tonsillar fossa but often there are no signs to confirm the diagnosis and patients may be dismissed as neurotic. Dysphagia is not a symptom with a documented association with styloid apparatus anomalies. However, as this case illustrates, these should be considered as a possible cause when indicated by radiological findings. Local radiographs may be adequate to demonstrate any anomaly but, if the region is difficult to visualize, tomography or computed tomography may be more helpful. Alleviation of symptoms may be dramatic following surgical excision of the elongated process or ossified stylohyoid ligament.

Case report

A 49-year-old man was referred with a six month history of intermittent episodes of difficulty in swallowing which he described as though his throat was 'in spasm'. The episodes lasted 15 to 20 mins, were associated with absolute dysphagia for solids and liquids, and resolved spontaneously. Clinical examination revealed no abnormality but plain radiographs demonstrated a long styloid process and an ossified stylohyoid ligament on the right side with a pseudarthrosis between them (Fig. 1a). A dynamic study of swallowing done by videofluoroscopy showed normal movement at the pseudarthrotic joint on swallowing and gastro-oesophageal reflux causing early closure of the cricopharyngeus. The latter was thought to be a possible cause of his symptoms; however, the symptoms did not resolve on triple anti-reflux therapy. A pharyngo-oesophagoscopy performed under general anaesthesia was normal although it was possible to palpate the elongated styloid process in the tonsillar fossa. Ultimately, one and a half inches of the ossified stylohyoid ligament were excised via an external approach through an incision along the anterior border of sternomastoid (Fig. 2). The patient's symptoms were dramatically alleviated following this procedure.

Discussion

The styloid apparatus is derived from the second branchial arch cartilage, Reichert's cartilage. The stylohyoid ligament connects the bone of the styloid process to the hyoid bone at the lesser horn. The degree of ossification of the stylohyoid ligament and lesser horn of the hyoid is variable; this is not thought to be an age-dependent degenerative change (Dwight, 1907). Ossification may be segmental with ligamentous unions between the parts allowing some mobility (Dwight, 1907) although total ossification to form a bar of bone has also been described (Lipshutz, 1922).

The styloid process is related to the external carotid artery laterally and the internal carotid artery medially. The stylohyoid ligament is the immediate lateral relation of the glossopharyngeal nerve. Medial to the tip of the styloid process is the superior constrictor muscle which, along with the pharyngobasilar fascia, separates it from the tonsillar fossa.

Styloid apparatus anomalies are often a coincidental asymptomatic radiological finding. It has been suggested that the presence or absence of clinical symptoms may be dictated by variations in the shape of the jaw and the length and position of the lateral process of the atlas in relation to the long styloid process (Loeser and Cardwell, 1942). The average length of the styloid process is 3.27 cm but it is subject to considerable variation (Moffat *et al.*, 1977).

Since swallowing consists of a complex sequence of movements involving pharyngeal constrictor activity and hyoid elevation, it is easy to see how superior constrictor 'spasm' and impaired hyoid movement might occur with unilateral fixation by a bony stylohyoid bar. The pseudarthrosis demonstrated in this case could allow intermittent 'locking' or fixation to occur and its surgical interruption would then result in restoration of 'symmetrical' deglutition.

Previously described clinical manifestations of styloid apparatus anomalies are varied. Pain is a common feature; pharyngeal pain on swallowing, referred to the ear: Eagle's syndrome (Eagle, 1937), glossopharyngeal neuralgia (Loeser and Cardwell, 1942), otalgia (Asherson, 1957) and carotidynia, with or without pulsatile tinnitus (Eagle, 1948) have all been reported. Dysphonia (Blatchford and Coulthard, 1989), globus pharyngeus (Paparella and Shumrick, 1980) and palpable neck lumps (Moffat *et al.*, 1977) have also been attributed to anomalous styloid apparatus anatomy.

Definitive treatment is surgical amputation of the tip of the styloid process or proximal ossified stylohyoid ligament. This may be performed intra-orally (Ranger, 1976) or via an external approach. The latter has the advantages of better access and a lower risk of infection (Moffat *et al.*, 1977). Simple digital outfracture of the styloid process is also described but is unreliable (Eagle, 1948) and, indeed, accidental fracture or dislocation of the tip of an unduly long styloid process may cause further symptoms (Asherson, 1957).

Department of Otolaryngology, Radcliffe Infirmary, Oxford and *Department of Radiology, University of Oxford.
Accepted for publication: 15 July 1991.

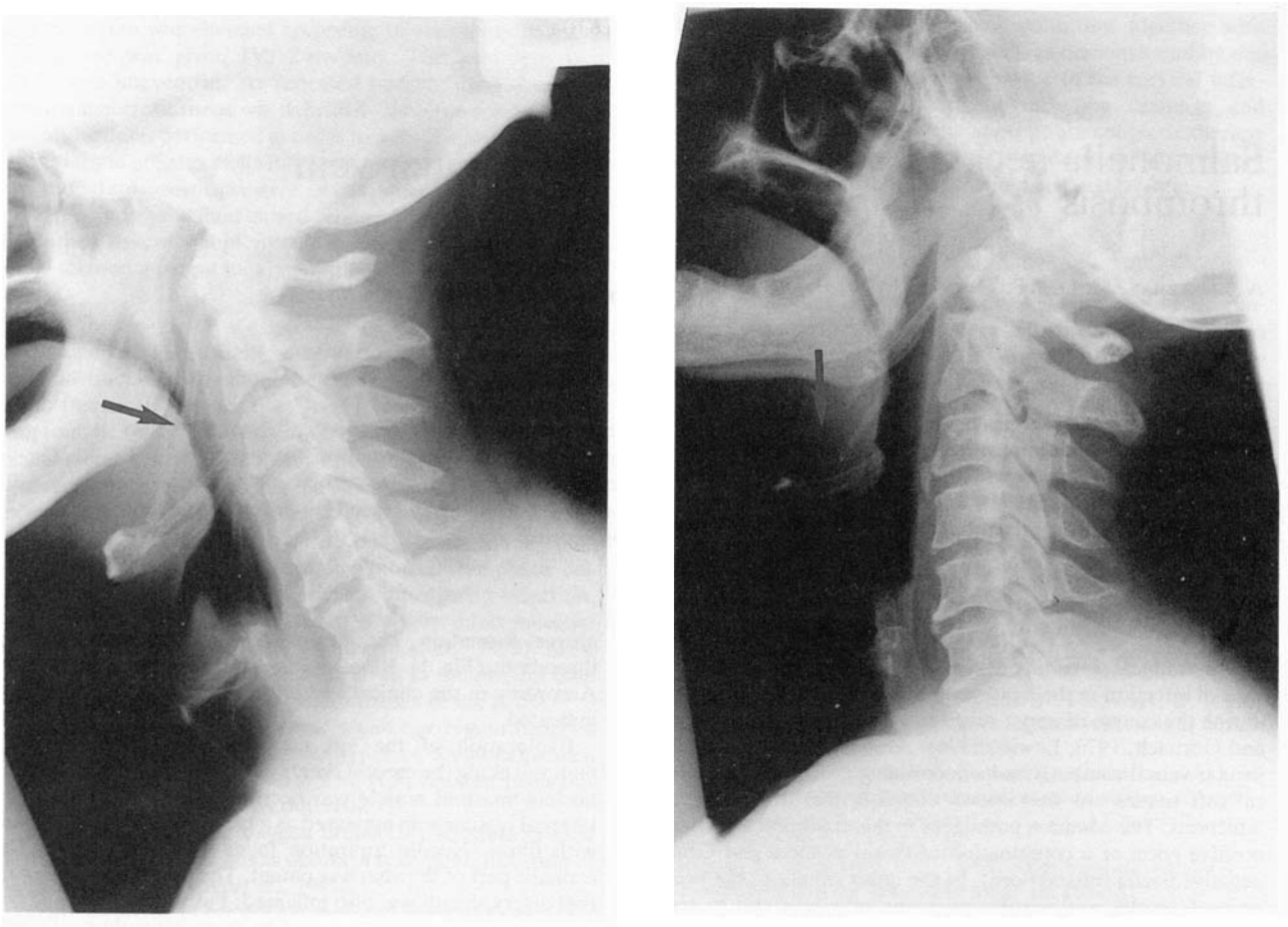

FIG. 1

Lateral neck radiographs showing (a) the pseudarthrosis between an elongated styloid process and an ossified stylohyoid ligament and (b) the postoperative appearance.

This case suggests dysphagia as a new presentation of anomalous styloid apparatus anatomy and confirms the need not to dismiss such radiological findings as purely anatomical variants of no clinical significance.

References

Asherson, N. (1957) Glosso-pharyngeal neuralgia (otalgia) and the elongated styloid process: a record of five cases. *Journal of Laryngology and Otology,* **71:** 453–470.

Blatchford, S. J., Coulthard, S. W. (1989) Eagle's syndrome: An atypical cause of dysphonia. *Ear, Nose and Throat Journal,* **68:** 48–51.

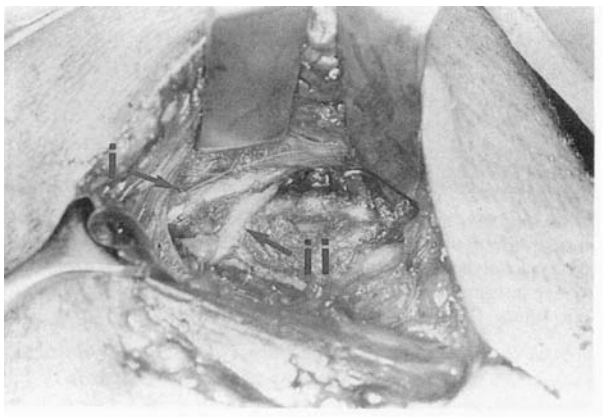

FIG. 2

Exposure, via an external approach, of the ossified stylohyoid ligament (i) in close relation to the hypoglossal nerve (ii).

Dwight, T. (1907) Stylo-hyoid ossification. *Annals of Surgery,* **46:** 721–735.

Eagle, W. W. (1937) Elongated styloid processes: Report of two cases. *Archives of Otolaryngology,* **25:** 584–587.

Eagle, W. W. (1948) Elongated styloid process. Further observations and a new syndrome. *Archives of Otolaryngology,* **47:** 630–640.

Lipshutz, B. (1922) The clinical importance of ossification of the stylohyoid ligament. *Journal of the American Medical Association,* **79:** 1982–1984.

Loeser, L. H., Cardwell, E. P. (1942) Elongated styloid process. A cause of glossopharyngeal neuralgia. *Archives of Otolaryngology,* **36:** 198–202.

Moffat, D. A., Ramsden, R. T., Shaw, H. J. (1977) The styloid process syndrome: Aetiological factors and surgical management. *Journal of Laryngology and Otology,* **91:** 279–294.

Paparella, M. M., Shumrick, D. A. (1980) Elongated styloid process. In *Otolaryngology* Vol. III Head and Neck, Second edition. W. B. Saunders Company, Philadelphia, London, Toronto, pp 2275–2278.

Ranger, D. (1976) Division of a long styloid process in the tonsillar fossa. In *Operative surgery.* Third edition. (Rob, C., Smith, R., general eds., Ballantyne, J., volume ed.) Butterworths: London, pp 158–160.

Address for correspondence:
Mrs S. E. J. Leighton, F.R.C.S.,
Department of Otolaryngology,
St George's Hospital,
Blackshaw Road,
London SW17.

Key words: Styloid process; Deglutition disorders