Stylohyoid syndrome

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It is not uncommon, in a busy E.N.T. department, to be asked to see a patient with pain around the region of the hyoid bone in the lateral aspect of the neck and frequently associated with discomfort in the throat. Many such patients have had one, if not more, courses of antibiotic therapy without any relief from their symptoms. Examination of the pharynx and larynx shows no abnormality and often these symptoms tend to be labelled as psychosomatic in origin. A few of these patients may well be referred to the department of physical medicine for a course of local heat, either as short-wave diathermy or radiant heat, with very little benefit. Unfortunately, patients with such severe symptoms are disappointed by the lack of appraisal of their clinical problems. A careful palpation of the neck invariably reveals extreme tenderness over the lesser cornu of the hyoid bone at the insertion of the stylohyoid ligament as shown in fifteen such patients seen over a period of twenty months. There may be ossification in the stylohyoid ligament in a few, and to such a symptom complex the term stylohyoid syndrome is applied for reasons to be discussed. A new method of treatment by local infiltration of 40 mg. of Methyl Prednisolone (Depomedrone) into the insertion of the stylohyoid ligament has resulted in complete relief of symptoms.

Case histories

Case No. 1

E.L. Female aged 33 years, was first seen in the out-patients on 1 July 1966 with a three months' history of constant pain in the left side of the neck, shoulder and pectoral regions. No abnormality was detected in the pharynx, larynx or naso-pharynx and she had a normal cervical spine on radiography. She was referred to the department of physical medicine where once again nothing abnormal was detected. The patient was followed up by her own general practitioner and received various tablets from time to time. including antibiotics, without relief. She was, however, referred back to the out-patients with severe pain in the left side of the throat associated with constant sore throat. Phonation exaggerated the pain. She had a normal pharynx, larynx and naso-pharynx on examination. However, careful palpation of the neck showed severe tenderness at the insertion of the stylohyoid ligament into the lesser cornu of the hyoid. A blood count and E.S.R. were both normal. Radiographs of the stylohyoid ligaments revealed bilateral calcification (Fig. 1). The tender spot was infiltrated with 40 mg. of Depomedrone resulting in complete relief from pain within three days of the injection for the first time ever in

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three years. At subsequent follow-up three months later she has remained symptom free and without tenderness over the lesser cornu.

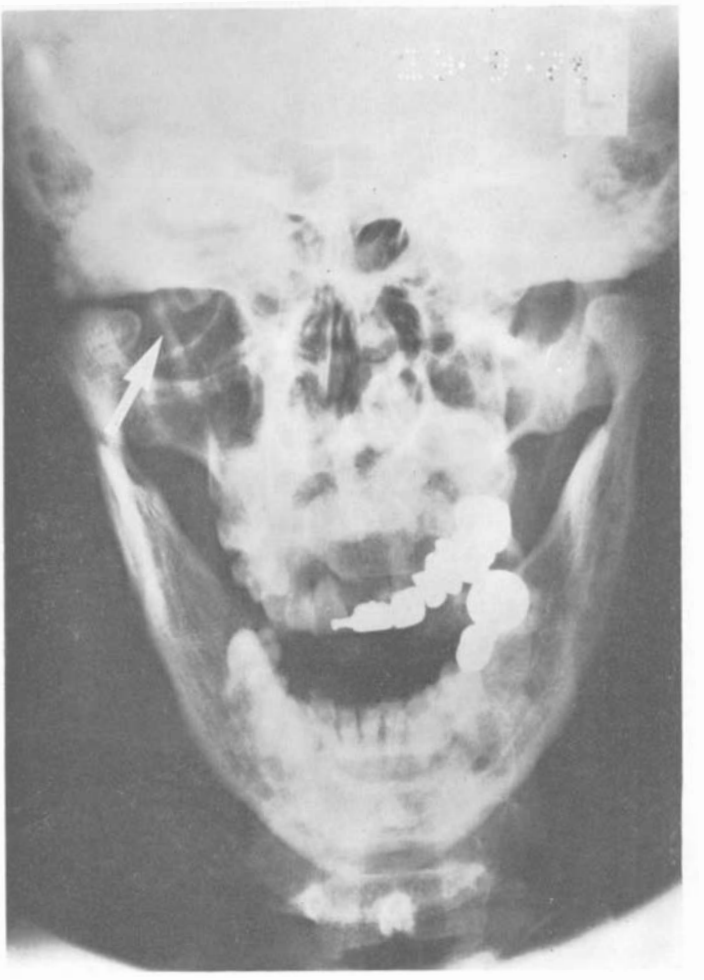


FIG. 1.

Bilateral calcification of the stylohyoid ligaments. The right ligament is shown by the arrow. (Case No. 1.)

Case No. 2

M.B. Female aged 33 years was seen in the out-patients in October 1970 with eight years' history of intermittent pain, not relieved by analgesics, in the left side of the neck and throat. She was extremely tender over the lesser cornu of the hyoid and had a normal pharynx and larynx. Barium swallow and radiographs of the cervical spine were normal. She had a normal blood count and E.S.R. *On 9 November 1970, 40 mg.* of Depomedrone was injected into the insertion of the stylohyoid ligament following which she has remained symptom free for a year.

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Case No. 3

S.Z. Female aged 24 years was seen in the out-patients in April 1970 with a three months' history of severe but intermittent pain in the left side of the neck radiating to the left ear. Movement of the neck to the left caused excruciating pain. She also complained of left-sided deafness and tinnitus and gave a history of otorrhoea in childhood. Examination of the ears showed a scarred and retracted left tympanic membrane with a negative Rinne's test (512 c.p.s.). The only positive physical sign in the neck was the presence of tenderness over the lesser cornu of the hyoid. Radiographs showed bilateral calcification in the stylohyoid ligaments (Fig. 2) and on 16 March 1971, 40 mg. of Depomedrone was injected into the insertion of the left stylohyoid ligament

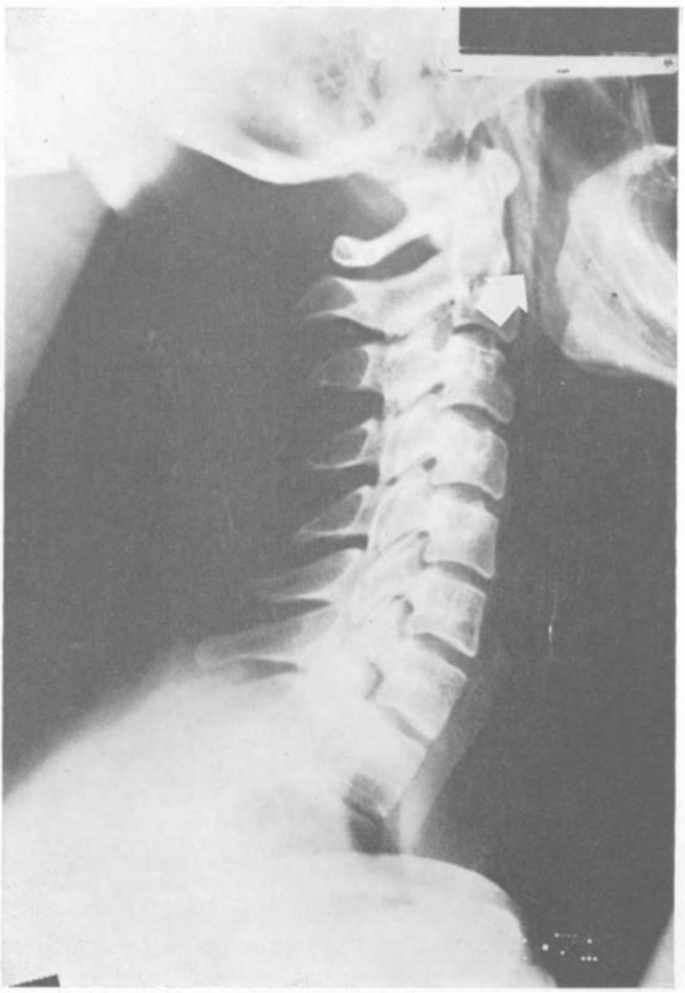


FIG. 2.

Lateral view of the neck showing left calcified stylohyoid ligament. (Case No. 3.)

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resulting in complete relief of symptoms. When seen seven months following the injection, she has remained symptom free and without tenderness over the left lesser cornu of the hyoid. Recently she had an homograft incus interposition in the left ear following which the hearing has returned to normal.

Case No. 4

A.W. Fifty-two-years-old female was first seen in the out-patients in June 1971 with a six weeks' history of sore throat. She had had a course of antibiotics from her general practitioner without relief. During a bout of coughing she developed sudden and severe pain in the left side of the neck radiating to the left ear. Pain was exaggerated by coughing, swallowing and phonation. Examination of the pharynx and larynx was normal; however, there was severe tenderness over the left lesser cornu of the hyoid bone. Radiographs showed bilateral calcification in the stylohyoid ligaments (Fig. 3). She was given a supply



FIG. 3.

Bilateral calcified stylohyoid ligaments seen between the lateral edge of the cervica vertebrae and medial margin of the ramus of the mandible. (Case No. 4.)

of analgesics which, even in double the dose, failed to relieve the pain. Due to the severity of the pain, the patient reported to the department two days later and the insertion of the left stylohyoid ligament into the lesser cornu of the hyoid was injected with 40 mg. of Depomedrone. Within three days she became symptom free and remained so for five months. When reviewed at six months

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following the injection, she complained of discomfort in the left side of the throat with reappearance of the tender spot over the lesser cornu. Blood count and E.S.R. were normal. Barium swallow showed no abnormality and radiographs of the cervical spine show narrowing of disc spaces of C5 and C6. A further 40 mg. of Depomedrone was injected into the left lesser cornu of the hyoid resulting in relief of symptoms up to the last follow-up three months following the injection.

Case No. 5

L.R. Seventy-five-years-old man was seen in February 1969 with a twelve months' history of 'dragging feeling' in the left side of the throat. There was no abnormality in the pharynx or the larynx and the patient was reassured. However, he was referred back to the out-patients by the practitioner in September 1971 with severe burning pain in the left side of the neck radiating to the ear. He had a normal pharynx and larynx on examination but was very tender over the left lesser cornu of the hyoid. Radiographs of soft tissue of neck, cervical spine and sinuses were normal. On 4 October 1971, 40 mg. of Depomedrone was injected into the left lesser cornu following which he has remained symptom free when seen at three weeks and three months.

Case No. 6

M.P. Forty-years-old female had a bout of common cold in March 1971 which left her with left-sided pain in the neck and sore throat. She was seen in June 1971 with a history of severe pain in the throat which was exaggerated by movements of the neck, sneezing and coughing. Often the pain woke her at night and several short courses of antibiotics had little effect. Examination showed normal pharynx and larynx, but there was severe tenderness over the left lesser cornu of the hyoid. On 2 June 1971, 40 mg. of Depomedrone was injected into the left lesser cornu. There was considerable difficulty in locating the lesser cornu due to the excessive layer of subcutaneous adipose tissue. However, following the injection she was symptom free for only ten days with recurrence of pain and tenderness over the lesser cornu. A further injection of 40 mg. of Depomedrone was administered into the lesser cornu giving her total relief from pain. She has remained symptom free when last seen nine months following the injection.

Case No. 7

D.T. Female aged 60 years was seen on 4 March 1969 with recurrent sore throat and pain in the left side of neck radiating to the ear. Examination showed a normal pharynx and larynx and radiographs of the sinuses were clear. Past history included tonsillectomy in 1951 for sore throats. In 1954 cervical spondylosis was diagnosed for pain in the left side of the neck radiating to the ear and left shoulder. Radiographs of the cervical spine then showed narrowing of disc spaces between C5 and C6. She received a course of short-wave diathermy to the neck with temporary relief.

She continued to have pain in the left side of neck radiating to the left ear and when seen on 1 June 1971, she had a normal pharynx and larynx but there

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was severe tenderness over both lesser cornua of the hyoid. The left lesser cornu was injected with 40 mg. of Depomedrone resulting in complete relief of pain so much so that when seen five weeks later the right side was also injected at patient's own request. A further injection of 40 mg. of Depomedrone was administered on the left side five months later, since when she has remained symptom free.

Case No. 8

C.S. Sixty-five-years-old female was first seen on 1 June 1971 with a two months' history of discomfort in the throat. She had had one course of penicillin from her general practitioner without relief. The pharynx and larynx were normal on examination, but there was acute tenderness over the right lesser cornu of the hyoid. Radiographs of soft tissue neck and cervical spine were normal. During observation in the out-patients, the pain continued unabated during the next three months and when seen on 28 September 1971, she complained of excruciating pain in the left side of the neck associated with acute tenderness over the lesser cornu of the hyoid, for which she received 40 mg. of Depomedrone infiltrated into the lesser cornu. When seen five months later she has remained symptom free.

Discussion

The hyoid bone is suspended from the base of the skull by muscles and ligaments. By virtue of various muscular attachments it is intimately connected above to the mandible, tongue and the styloid process; below to the scapula, manubrium sterni and thyroid cartilage; to the pharynx at the sides. Thus the hyoid bone is an extremely mobile structure in the neck, moving as it does with respiration, phonation and deglutition. Developmentally the upper part of the body of the hyoid is derived from the second visceral arch (hyoid arch). The stylohyoid ligament, with which the present report is mainly concerned, is derived from the sheath of the second arch cartilage between the styloid process above and the lesser cornu below (Hamilton, Boyd and Mossman, 1945). The stylohyoid ligament is attached above to the tip of the styloid process and below to the lesser cornu of the hyoid (Gray, 1967). The stylohyoid muscle on the contrary is attached above to the posterior surface of the styloid process and below to the body of the hyoid at the junction with the greater cornu. The mobility of the hyoid bone has been a subject of intense investigation; thus Stepovich (1965) showed from cephalometric studies that accurate measurements of the movements of the hyoid bone was always fraught with difficulty as a result of considerable changes in the position of the hyoid in the same individual from minute to minute. Furthermore, Stepovich (1965) concludes that previous authors using radiographic studies of the hyoid failed to take cognizance in the fluctuation of its position.

However, Shelton *et al.* (1960) using cinefluorographic methods in ten

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normal subjects observed that during phase I of swallowing in the upright position, the hyoid moved directly upwards and in phase II it moved ventrally or obliquely upwards; in phase III the hyoid was displaced dorsally. The extent of the movement in phase I was equivalent to approximately half the full height of the middle cervical vertebrae. During phonation, however, there was no consistent pattern of displacement. Recently, Steinmann (1968) concludes from a series of radiographic studies that during inspiration the hyoid was level with the upper border of the third cervical vertebra and during expiration it had descended to the lower border of the third cervical vertebra; during phase I of swallowing the hyoid was observed to be about the upper border of third cervical vertebra and at the level of middle of the same vertebra during phase II of swallowing. Phonation causes the hyoid to assume a position level with the lower border of the third cervical vertebra. From the available studies there seems little doubt that the hyoid bone is an extremely mobile structure moving as it does with respiration, phonation and deglutition.

Several syndromes have been described in connection with the stylohyoid chain (styloid process, stylohyoid ligament and lesser cornu) and Richards (1970) divides these briefly into two groups—group I is associated with total ossification of the stylohyoid ligament in which the commonest mode of presentation is failure at per-oral endoscopy; group II is associated with ossification of the proximal half of the stylohyoid ligament and could present as (*a*) acute dysphagia due to fracture of the elongated styloid process, (*b*) glossopharyngeal neuralgia, (*c*) stylocarotid syndrome (Eagle, 1949) in which the elongated styloid process is responsible for pain in the distribution of the external or internal carotid arteries. Brown (1954) described hyoid bone syndrome in a group of thirty-five patients in whom the main features were pain in the neck and throat associated with tenderness over the tip of the greater cornu of the hyoid. Recently Steinmann (1968) described a similar group of thirty patients all of whom had variable degree of thickening of the greater cornu in addition to tenderness. Zachary *et al.* (1969) described a single case of omohyoid syndrome in a 56-year-old male who developed severe pain in the right side of the neck following yawning and swallowing with his head turned to the left; there was severe tenderness along the course of the right omohyoid muscle due to spasm of the muscle.

In the present report all patients manifested a totally different clinical picture compared to the known syndromes described around the region of the hyoid, often of long duration, which was frequently referred to the throat or ear and in all patients there was acute tenderness over the lesser cornu of the hyoid bone in the region of insertion of the stylohyoid ligament. Furthermore, in the syndromes described in connection with the elongated styloid process, the majority of the patients developed their symptoms following tonsillectomy (Eagle, 1949) and the presenting

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features were difficulty in swallowing or dragging pain in the throat. In glossopharyngeal neuralgia the lesser cornu is not tender and radiographs of the neck confirm the presence of elongated styloid process. In patients described in this report only three patients had ossified stylohyoid ligaments and in a further two there were degenerative changes in the cervical spine. It is alleged that 4 per cent of the population have calcified stylohyoid ligaments (Eagle, 1949). However, all these patients had the typical tenderness over the lesser cornu. In the hyoid bone syndrome (Brown, 1954) and the styloid syndrome (Steinmann, 1968) the tenderness was confined to the greater cornu of the hyoid. Since the presentations in this report show a consistent pattern both in their symptomatology and physical signs, it would be appropriate to separate this entity from the well-known syndromes in this region and because of the persistent acute tenderness over the lesser cornu of the hyoid, where the stylohyoid ligament is inserted, to label this particular symptom complex as stylohyoid syndrome.

The aetiology and pathology in the present group of patients is obscure other than supposition that it may be due to degenerative changes in the fibres of the stylohyoid ligament at its insertion, a hypothesis supported by the relief obtained from local infiltration with corticosteroids. Case No. 4 presented with acute symptoms precipitated by a bout of coughing and it is tempting to postulate that the violent strain from coughing caused rupture of the degenerated fibres. The degeneration is probably caused by constant movements of the hyoid bone during deglutition, phonation and respiration. Pedersen *et al.* (1951) have described the histological changes from patients having similar degenerative changes in the tendinous insertion elsewhere in the body, notably in the supraspinatus tendon.

Treatment of syndromes associated with ossified stylohyoid chain (i.e. failed per-oral endoscopy group, acute dysphagia group, glossopharyngeal neuralgia group and stylocarotid group) has been that of excision of the elongated styloid process. Treatment of hyoid bone syndrome varies from simple reassurance (Brown, 1954) to injection of a composite preparation of procaine and caffeine into the lower pole of the tonsillar niche (Steinmann, 1968). The treatment of the omohyoid syndrome is sedation and rest (Zachary *et al.*, 1969). Treatment in the present group of patients consisted of injection of 40 mg. of Methyl Prednisolone (Depomedrone) into the lesser cornu of the hyoid and is carried out with the patient lying supine with the head rotated to the opposite side to allow good access. By gentle pressure on the opposite greater cornu, the hyoid bone on the affected side is thrown into prominence. After identification of the lesser cornu, usually shown by the tenderness, the injection is completed by using a disposable No. 21 gauge needle. The exact location of the tip of the needle in the lesser cornu is indicated by the grating sensation. There have been no complications up

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to date following the injection. Most patients required only one injection of 40 mg. of Depomedrone whilst in three patients a second injection was necessary to relieve the symptoms. There were eight patients who required the treatment with females predominating (seven females and one male). The youngest patient was 24 years and the oldest 75 years. In the majority the symptoms were unilateral with the left side being the commoner. In two patients, however, the symptoms were bilateral; only one patient required bilateral injection. All patients up to the time of writing are symptom free following the injection. A further seven patients with mild symptoms and of shorter duration are at present under observation in the out-patients at their own request.

Summary

A total of fifteen patients with pain in the side of the neck associated with tenderness over the lesser cornu of the hyoid were seen over a period of twenty months. To this symptom complex the term stylohyoid syndrome is suggested. In eight patients the symptoms were severe and had been present for six weeks to eight years. In these patients 40 mg. of Depomedrone was infiltrated into the lesser cornu with complete relief of symptoms up to the time of writing. Seven patients who did not have the treatment are being followed up currently in the out-patients.

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