

Claudication on mastication following bilateral external carotid artery ligation for posterior epistaxis

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Abstract

This case highlights a potentially disabling complication of intermittent claudication in the region of the masseter muscles on mastication, following bilateral external carotid artery ligation for epistaxis. Although there have been few reports of this complication this may be a reflection of the fact that the operation is rarely performed, and not because the complication is rare. Its potentially disabling nature, and its possible common occurrence after this procedure make awareness of it by surgeons who may carry out this procedure important.

Key words: Epistaxis; Intermittent claudication; Masseter muscle; Carotid artery, external; Ligation

Introduction

The surgical management of posterior epistaxis has long been established. Options include ligation of the ethmoidal, maxillary or the external carotid arteries (Shaheen, 1975). The ligation of the external carotid has the advantage that it is surgically easier, and can be done under local anaesthetic. Furthermore it appears to be effective in the control of epistaxis in the long term (Cook, 1985; Waldron and Stafford, 1992).

Bilateral external carotid ligation is rarely performed, and therefore little is known about specific complications associated with it. There have only been three previous cases reported of claudication on mastication following this procedure. The reason for such few reports may be because the operation is rarely performed and not because the complication is rare.

Case report

A 49-year-old man initially presented with a persistent left serous otitis media, and following investigations he was found to have a poorly differentiated nasopharyngeal carcinoma for which he received a full course of radiotherapy. At review over the following three years there was no evidence of recurrence, but he reported recurrent episodes of bilateral posterior epistaxis. This had required numerous admissions, and each time the bleeding had been controlled by conservative measures. More recently the epistaxis had become severe and more frequent. He was otherwise fit and well, a non-smoker and on no medication.

On this occasion he was admitted with a further episode of severe bilateral posterior epistaxis. This was controlled with a posterior nasal balloon, and anterior nasal packing. Haematological investigations revealed a normal platelet count and clotting screen, but a haemoglobin of 9.9 g/dl which was significantly lower than when measured in clinic three days prior to admission (13 g/dl).

In view of the recurrent nature and severity of his symptoms, after discussion with the patient it was decided to carry out a panendoscopy and biopsy of the post-nasal space as well as bilateral external carotid and anterior ethmoidal artery ligation. The endoscopy, and histology of the biopsy confirmed no evidence of recurrence, or any visible bleeding points. The anterior ethmoidal and external carotid arteries were ligated. The right above the lingual artery, and the left above the superior thyroid artery.

The patient was discharged after 48 hours following an uncomplicated post-operative period. Prior to the operation he had no problems on chewing, but on review in clinic 10 days later he reported cramp-like pain in the region of the masseter and temporalis muscles bilaterally while eating solids. There was no sign of temporomandibular joint tenderness or clicking, or any muscle tenderness on palpation. Review of the notes revealed that he had had an easy (grade 1) intubation. Two months after the operation his symptoms had markedly improved, but he continued to get cramp-like pain mainly in the region of the temporalis muscles after chewing gum for two minutes. The pain was relieved after two minutes rest. His 'chewing tolerance' continues to improve. He has had no further episodes of epistaxis.

Discussion

Although 'claudication' is derived from the Latin meaning 'to limp' it is generally accepted that it may be used to describe the characteristic pain experienced as a result of occlusive arterial disease. The pain, which is most commonly experienced in the leg, is typically cramp-like in nature, induced by exercise, and relieved by rest. Continuous exercise sometimes through the pain encourages the development of collateral vessels, and with it brings relief of symptoms.

Claudication on mastication is a common symptom of temporal arteritis, and is believed to be due to vasculitic obstruction or stenosis of the arteries supplying the

muscles of mastication (Achkar *et al.*, 1995). It has also been described in a case of atheromatous occlusion of the external carotid artery (Lewis *et al.*, 1978), although it does not appear to be a feature of unilateral external carotid ligation. There have only been three cases reported following bilateral external carotid ligation (Liston and Siegel, 1990). In the latter three cases the symptoms persisted to various degrees, and the patients had to adapt their diet regimens accordingly. Only in one of the cases did the patient have a history of peripheral vascular disease, which suggests that the development of claudication after bilateral external carotid ligation is not dependent on this. The possibility that the symptoms may be attributable to 'Temporo-mandibular joint dysfunction' cannot be discounted, although the findings on clinical examination, the easy intubation, and the nature of the operation all suggest that the symptoms are most likely to be due to the reduction in the blood supply to the muscles.

The blood supply to the muscles of mastication is mainly via the branches of the second part of the maxillary artery, with a smaller contribution from other branches of the external carotid artery (Gabella, 1995). The deep temporal branches of the second part of the maxillary artery, anterior and posterior, supply mainly the temporalis. The anterior anastomoses with the lacrimal by small branches perforating the zygomatic bone and the greater wing of sphenoid. Pterygoid branches and the masseteric artery supply the respective muscles, the latter anastomosing with the masseteric branches of the facial and transverse facial arteries (branch of the superficial temporal artery). It is clear that the muscles of mastication are mainly supplied by the external carotid, except for a small contribution from the lacrimal artery (Liston and Siegel, 1990).

The fact that external carotid ligation reduces, maxillary artery blood flow has been illustrated experimentally (Rosenberg *et al.*, 1982). It seems reasonable to assume that this reduction in the blood supply to the muscles of mastication gives rise to the symptoms of claudication on mastication. With the development of collateral supply, as well as adaptation of chewing habits the problem may be overcome. Nevertheless if the recovery is slow or if the symptoms are severe it is clear that this complication may be very disabling. As this procedure is not a common one,

the lack of reports of this complication do not necessarily imply that the complication itself is rare. Although there is only a limited place for bilateral external carotid ligation for the control of posterior epistaxis, until further studies are carried out; it would seem reasonable to advise that all patients undergoing this procedure should be warned of this potentially disabling, although not necessarily rare complication.

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