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Sir,

Partial facial paralysis following temporal artery biopsy

A superficial temporal artery (STA) biopsy is often required to confirm the diagnosis of giant cell arteritis (GCA) prior to committing the patient to a long course of corticosteroid therapy.¹ It is considered a benign procedure with a low complication rate. However, complications can occur as in any surgical procedure, including infection, bleeding, haematoma formation, wound dehiscence and scarring. Recently, we encountered a patient who developed a partial facial paralysis manifested by brow ptosis following a STA biopsy.

Case report

A 63-year-old woman was referred to the neuro-ophthalmology service for evaluation of possible ocular involvement due to GCA although she was visually asymptomatic. Her past medical history was notable for hypothyroidism, colon cancer, rheumatoid arthritis and atrial fibrillation.

On examination visual acuity was 20/20 in both eyes. Pupils were equal with no relative afferent pupillary defect. Extraocular movements were normal. Slit-lamp biomicroscopy and intraocular pressures were normal. The optic nerves were normal OU. External examination

Fig. 2. Low-power view (×13.2) of the pathological specimen demonstrating a small piece of artery (curved arrow) with predominantly nerve (arrows).

revealed subtle left-sided brow ptosis at rest (Fig. 1, left), an inability to raise the left eyebrow with contraction of the frontalis muscle (Fig. 1, middle) and normal orbicularis oculi function bilaterally (Fig. 1, right). No further tests were recommended.

One month prior to our evaluation, at the discretion of her primary physician, a general surgeon was consulted for a STA biopsy because of an elevated Westergren erythrocyte sedimentation rate (59 mm/h), left temporal headache and pain on mastication. Intraoperative reports indicate there was an estimated 200 cm³ of blood loss. Prior to surgery an arterial pulse was identified with the aid of a vascular ultrasound in the left temporal scalp region. After an unsuccessful first attempt with dissection that penetrated the deep facial layers, a second separate incision was made anteriorly, and after further dissection a small arteriolar branch was identified and collected along with a 'second specimen around it'. The pathological specimen from the STA biopsy demonstrated a small segment of artery with no signs of inflammation and normal facial nerve (Fig. 2).

A short trial of oral corticosteroids was unsuccessful in resolving her symptoms and eventually the headaches improved spontaneously.

Comment

GCA is a systemic vasculitis with involvement of medium-sized and large vessels. The only definitive diagnostic modality is the pathological demonstration of

Fig. 1. Left: Subtle left-side brow ptosis at rest (arrow). Middle: Note the inability to raise the left eyebrow with contraction of the frontalis muscle, demonstrating a partial facial nerve paresis. Right: Orbicularis oculi function intact bilaterally.

Fig. 3. The branches of the superficial temporal artery are illustrated in white and the facial nerve in black. The shaded box delineates the 'danger zone'.⁸ The anatomical landmarks composing the zone are: 1, tragus of the ear; 2, junction of the zygomatic arch and lateral orbital rim; 3, 2 cm above the level of the superior orbital rim and a line directly superior to (2); and 4, superior to the tragus and in horizontal alignment with (3).

vasculitis consistent with GCA. It is important to confirm the diagnosis, otherwise the patient may be committed to a long course of corticosteroid treatment with its potential deleterious side-effects.¹

The STA is the most commonly biopsied artery, with other potential sites being the occipital and facial arteries.^{2,3} STA biopsy is considered a fairly benign procedure with a low complication rate.¹ However, complications such as haematoma, infection, skin necrosis and cerebral stroke may occur.^{1,4-6} A review of the English language literature revealed only one previous case documenting brow droop following a routine STA biopsy.⁷ It is intriguing given the intimate anatomical relationship of the branches of the STA with the branches of the facial nerve that this has not been documented more frequently.

Several points need to be emphasised demonstrating the importance of surgical anatomy and technique of STA biopsies as it relates to our case. Pre-operatively, it is necessary to accurately identify and confirm the intended surgical site containing a branch of the STA, preventing random intraoperative dissection.

If the artery can not be properly identified and an incision has already been performed, a deeper dissection should not be performed and random samples of tissue should not be biopsied, as was the case with our patient. Not only is it important to understand the branching pattern of the STA but also the facial planes and the relationship of the various anatomical structures to one another. The branches of the STA course within the

superficial temporalis fascia, immediately beneath the subdermal fatty layer. However, the branches of the facial nerve innervating the temporalis muscle and upper half of the orbicularis oculi muscle run deeper, underneath the superficial temporalis fascia within the loose avascular areolar layer. The anatomical landmark that delineates the area where the temporal branch of the facial nerve is in most proximity to the frontal branch of the STA and therefore most susceptible to damage has been termed the 'danger zone'⁸ (Fig. 3). If a biopsy is performed within this area, particular attention should be paid to remaining above the superficial temporalis fascia, avoiding deep dissection into the plane of the branches of the facial nerve.

Although we suspect our patient was initially referred by her primary care physician to the general surgeon because of a referral bias, it is vital that any surgeon who is called upon to perform STA biopsies be familiar with the regional anatomy of the scalp and proper surgical techniques, thereby minimising potential post-operative complications.

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