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Subjective perception of paraesthesia of the lower lip after bilateral sagittal split osteotomy at a district general hospital

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Abstract

Our aim was to assess patients' perception of paraesthesia of the lower lip after bilateral sagittal split osteotomy (BSSO) at a district general hospital. Patients who had BSSO between August 2013 and August 2014 (n = 46) were asked to score their perception of numbness between 0–10 (0 = normal sensation. 10 = complete loss of sensation/total numbness) one day postoperatively and then weekly for seven weeks, and at three months, 6 months, and one year. Data was collected on score sheets and by regular contact by telephone. Of the 46 operated on, 31 were female and 15 male. Data were available one year postoperatively for 43 patients. Ten of the 92 sides were reported as feeling normal on day 1 postoperatively, three-quarters as feeling normal at six months, and 79 at one year. On multivariate analysis there was no significant difference in postoperative sensation at one year between sides operated on by the registrar (left) and consultant (right) operated (p = 0.76). Our results compared favourably with the limited data available in similarly designed studies.

Keywords: Bilateral Sagittal Split Osteotomy; Paraesthesia

Introduction

Bilateral sagittal split osteotomy (BSSO) is used to treat skeletal discrepancies while achieving a stable dental occlusion and an improved facial profile. Many patients may also require a Le Fort I maxillary osteotomy or genioplasty to achieve the desired result.

Mandibular orthognathic surgery was first described by Hullihen in 1846 for treatment of mandibular prognathism,[1] and the BSSO technique usually used in contemporary orthognathic surgery was first described by Trauner and Obwegeser in 1957.[2] Since the inception of this technique various modifications have been described to reduce complications, help prevent relapse, and improve healing. Commonly-used modifications were first described by Dal Pont, Hunsuck and Epker in the 1960s and 70s.[3] Bony healing required intermaxillary fixation until 1976, where rigid internal fixation was first described.[4]

Paraesthesia of the inferior alveolar nerve (IAN) is a well-documented postoperative complication of BSSO, which may be caused by injury to the IAN or its more distal portion, the mental nerve, which results in numbness of the ipsilateral side of the lower lip, chin, anterior gingiva, and teeth. Paraesthesia of the lower lip is usually imperceptible to others except during the early postoperative period, when it may be associated with increased oral incompetence during eating or ineffective phonation. A study has shown that only 7/50 patients with neurosensory deficit after BSSO described the

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problem as having a "moderate" or "serious" adverse impact on their lives.[5]

A systematic review of published papers in 2015 found that there was a wide variation in the reported incidence of paraesthesia of the IAN postoperatively, because there was a lack of standardised assessment protocols and reporting techniques. The authors concluded that an international consensus meeting should be held to remove ambiguity and establish an accepted standard.[6]

Subjective testing investigates a patient's perception of the numbness compared with their preoperative (baseline) sensation. Objective clinical testing is commonly achieved with two-point discrimination and light touch testing. It is critical that patients understand the risk and implications of paraesthesia of the lower lip before they give valid informed consent to operation.

A systematic review of previous publications showed that patients reported less paraesthesia of the IAN after objective than after subjective testing.[7] One week postoperatively, objective testing revealed 63.3% (n = 98) patients sensory disturbance compared with 83% of patients (n = 24) who were asked for their subjective opinion. One year postoperatively, 12.8% of patients (n = 195) reported some sensory impairment on objective testing compared with 23.8% of patients (n = 143) tested subjectively.[7] A subjective questionnaire-based study by Al-Bishri et al (2004)[8] found that 18.6% of 131 patients had some degree of paraesthesia of the lower lip at least one year postoperatively. A more historical review study compiled data from studies using the objective "two-point discrimination" test. It found that postoperative IAN sensory disturbance at one year was 15% (7/46 sides were affected).[10] There seem to be relatively few subjective datasets of paraesthesia after BSSO compared with more quantifiable objective methods. However, patients seem to be more likely to report more subjective loss of sensation than quantifiable (objective) loss.

Operative technique has also been shown to affect postoperative paraesthesia of the IAN. Another systematic review showed that the use of chisels during BSSO significantly increased the risk of postoperative paraesthesia of the IAN by over nine times.[11] One study in which the Obwegeser–Dal Pont technique was compared with the modified Hunsuck–Epker technique showed that the latter provided a more reliable fracture mechanism with less "bad splits" and fewer episodes of excessive bleeding. However, they found no significant differences in the incidence of long-term paraethesia.[12]

The aim of this prospective study was to investigate patients' subjective perception of paraesthesia of the lower lip after BSSO at Eastbourne District General Hospital, and we recorded patients' age and sex, experience of the operator, and the side of the lip affected.

The results are intended to be used to set a local standard against which future performance can be measured, and to contribute towards a national standard, which is yet to be established. They will be used to inform all patients of the risk of postoperative paraesthesia of the lower lip, and to help to gain informed consent for operation.

Methods

A questionnaire was distributed to all consecutive patients treated with BSSO at Eastbourne District General Hospital over the course of the year 7 August 2013–7 August 2014 (n = 46). Those who also had a genioplasty were excluded. A single consultant oral and maxillofacial surgeon and two different specialty registrars (ST5 and ST6) operated on the patients. Written consent was gained from all patients before inclusion in the study, and all were given the opportunity to opt out at any stage. All patients were reassured that their data would be strictly confidential and anonymised before publication or distribution. The chief investigators collected data from the self-completed questionnaires,which was supplemented with a weekly telephone call at the patient's discretion.

The patients were asked if they had any paraesthesia of the lower lip preoperatively as a result of a previous prophylactic lower third molar extraction, or for other reasons such as trauma. They were asked to give their perception of "numbness" of the lower lip on the left and right sides on their first postoperative day using a scale of 0–10 to communicate the "numbness score". Ten was used to imply complete numbness (anaesthesia) and 0 to imply complete sensation, and the baseline score was recorded on each individual questionnaire. The patients were then asked to score their perception of numbness weekly on the left and right sides for seven consecutive weeks, then at three and six months, and at a year. As many patients would have lost their questionnaires, we obtained verbal consent for telephone follow up if necessary or preferred.

Surgical technique

We approached the mandibular ramus through an incision about 3 cm long made with cutting diathermy buccal to the last standing tooth. The mucosa was then stripped off the temporalis tendon with a forked ramus retractor. After full exposure of the tendon, it was sharply divided sagittally and the medial component raised in the subperiosteal plane along the medial aspect of the ramus. This resulted in generous exposure, and the inferior alveolar bundle could clearly be seen and was without tension in all cases. Cortical cuts were made with burs using the Hunsuck modification, and these were made as close as possible to the buccal cortex. The splits were completed with osteotomes with progressive and controlled separation. Fixation was with three bicortical screws placed through a transbuccal trochar in all cases.

Statistical analysis

Data were collected using Excel 2003 and statistics generated with the help of MedCalc V14.10.2 (MedCalc Statistical

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