Available online at www.sciencedirect.com
SCIENCE DIRECT
British Journal of Oral and Maxillofacial Surgery 44 (2006) 20–23
BRITISH Journal of Oral and Maxillofacial Surgery
www.bjoms.com

Pterygomaxillary separation in Le Fort I osteotomy UK OMFS consultant questionnaire survey

Barry O'Regan *, Girish Bharadwaj

Maxillofacial Unit, Queen Margaret Hospital, Dunfermline, Fife KY12 0SU, UK

Accepted 13 July 2005
Available online 12 September 2005

Abstract

Pterygomaxillary osteotomy or leverage alone is commonly used to achieve separation of the posterior maxilla from the pterygoid process in the Le Fort I osteotomy. An osteotomy of the tuberosity is less often used. No published data exist on the extent to which surgeons in the UK have adopted these techniques or on the incidence of technique-related vascular complications.

We aimed to investigate techniques that are currently used for pterygomaxillary separation and maxillary mobilisation, and the incidence of serious vascular complications among orthognathic surgeons in the UK in 2004.

A questionnaire was sent to 301 oral and maxillofacial (OMFS) consultant surgeons in the UK and 205 were returned (response rate 68%). Most of these surgeons (78%) reported that they use an osteotome or a micro-oscillating saw for pterygomaxillary separation. The others use leverage alone or osteotomy of the tuberosity. Eleven (8%) of the surgeons who use a pterygomaxillary osteotome reported that they had had a serious vascular complication in the past year. There were no vascular complications reported by surgeons who use leverage alone or osteotomy of the tuberosity.

Keywords: Le Fort I osteotomy; Tuberosity osteotomy; Survey; Pterygomaxillary separation; Vascular complications; Orthognathic

Introduction

The Le Fort 1 (LFI) osteotomy is a proven and relatively safe orthognathic operation. Von Langenbeck[1] described it in 1859, and Wassmund[2] first used it in 1927 for correction of midfacial deformity. Axhausen[3] and Schuchardt[4] later described the separation of the pterygomaxillary suture using an osteotome.

A number of techniques are used to achieve pterygomaxillary separation.[5,6] A curved Obwegeser osteotome is often used through a blind approach to the pterygomaxillary suture to achieve separation.[7] Swan neck[8] and shark fin[9] modifications of osteotomes have also been described to improve the safety of this operation.

Precious et al.[10] reported that pterygomaxillary separation can be achieved safely and easily by leverage alone without the use of a pterygoid chisel. They described the use of Tessier's spreaders and digital manipulation to achieve pterygomaxillary separation followed by maxillary mobilisation. Smith's 3-prong spreaders, Turvey's maxillary expanders, and modified mobilisation forceps[11] are also used to aid leverage.

Concerns about the risk of haemorrhage as a result of pterygomaxillary separation led to development of osteotomy techniques anterior to the pterygomaxillary suture. Dupont et al.[12] described a transbuccal approach to a vertical osteotomy through the tuberosity. Trimble et al.[13] advocated an intraoral vertical osteotomy in the region of the tuberosity. Neither modification has been adopted widely in the UK. Rohner et al.[14] described an endoscopically assisted LFI osteotomy to ensure preservation of the descending palatine artery. Ueki et al.[15] recently reported the use of an ultrasonic bone curette

* Corresponding author. Tel.: +44 1383 623623x6637.
E-mail address: Barry.oregan@faht.scot.nhs.uk (B. O'Regan).

0266-4356/$ – see front matter
doi:10.1016/j.bjoms.2005.07.012

to mobilise the pterygoid process to avoid damage to the descending palatine vessels.

The incidence of serious complications after LFI osteotomy is low.[16] Vascular complications can arise from direct trauma to vessels because of the blind nature of the osteotomy, and unwanted fractures can extend to the pterygopalatine fossa, base of skull, and orbit.[18] The vessel most often involved is the descending palatine artery.[19] Less often the maxillary artery and its terminal branches, the pterygoid venous plexus, the internal carotid artery, and internal jugular vein may be damaged.[20]

We found no published prospective comparative studies on technique-related serious vascular complications of pterygomaxillary separation in LFI osteotomy. We therefore made a questionnaire survey of all OMFS consultants in the UK in the year 2004 to identify the techniques used to achieve pterygomaxillary separation and the incidence of serious vascular complications.

Method

In late December 2004, a questionnaire was sent by mail to all consultant OMFS surgeons in the UK (301) based on the directory of the British Association of Oral and Maxillofacial Surgeons. A pilot questionnaire was initially sent to all Scottish consultant OMFS surgeons (23) and the results of this pilot study (response rate 87%) were presented at the annual meeting of the Scottish Oral and Maxillofacial Society in October 2004. The questionnaire was modified (Table 1) and the survey expanded nationally.

We did not attempt to explore the level of experience of, or number of operations done by, each surgeon, nor did we attempt to identify those surgeons who may have used more than one method of pterygomaxillary separation. We defined a serious vascular complication as one that required blood transfusion or the return of the patient to theatre and assumed that in bimaxillary cases, surgeons would report only those cases where bleeding arose as a consequence of the maxillary operation.

Results

Three hundred and one questionnaires were sent and 205 (68%) were returned. Two replies were invalid.

Q1. Orthognathic practice status:

One hundred and seventy-five (86%) of the respondents did LFI osteotomies (Table 2).

Q2. Pterygomaxillary separation by osteotomy:

Table 1
UK OMFS consultant survey 2004

Pterygomaxillary separation in the non-cleft low level Le Fort I osteotomy

Q1. Do you regularly perform a Le Fort I osteotomy? Yes No

Q2. Do you routinely perform a pterygomaxillary osteotomy for separation? Yes No

If yes, what technique do you use?

Curved or straight osteotome Microoscillating saw

Q3. If the response to Q2 was No,

what other technique do you use for pterygomaxillary separation?

Leverage alone Tuberosity osteotomy

Q4. Which downfracture or leverage technique do you use for maxillary mobilisation?

Digital Smith's spreaders Rowe's forceps Tessier's/Turvey's expander

Q5. Have you experienced a serious vascular complication in the past year? Yes No

Peroperative Postoperative Requiring transfusion Return to theatre

Q6. Have you experienced any other serious complication in the past year? Yes No

Please expand