

Technical Note Orthognathic Surgery

The Edinburgh modification of the minimal access zygomatic osteotomy, used for the correction of zygomatic orbital hypoplasia

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Abstract. Zygomatic hypoplasia can be an exceedingly difficult proposition for the surgeon treating facial deformity. The classical approach would be a coronal access, which is time-consuming, leaves a long scar on the scalp that shows in patients with balding patterns, and carries the risk of permanent facial weakness. The Edinburgh technique presents a minimal access approach to the zygomatic osteotomy. This is performed through local incisions and a bone cut made using hand-held diamond-coated wire that mobilizes the entire zygoma.

Key words: facial deformity; zygomatic osteotomy; zygomatic orbital hypoplasia; diamond-coated wire.

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Lateral midface hypoplasia is usually treated with alloplastic onlays, as the morbidity resulting from bicoronal exposure may make the cosmetic benefit marginal. Mommaerts et al.¹ and Bettens et al.² have offered an alternative in the form of an intraoral sandwich technique approach; however, this does not include the majority of the body of the zygoma or the lateral orbital rim.

The Edinburgh technique is a minimal access approach to the zygomatic osteotomy through an established aesthetic eyelid incision and uses a diamond-coated wire to mobilize the entire zygoma.

Case

A 25-year-old female biosciences PhD student was assessed by the cleft multidisciplinary team and considered appropriate for bimaxillary osteotomy and bone graft for her class 3 malocclusion. She also wished to undergo correction of her midface asymmetry during the same operation, but she did not consider a bicoronal scar and the risk of facial weakness as acceptable risks given the level of her concern regarding the asymmetry. At the time of presentation, the department had been working on a cutting diamond wire

for 2 years and had hospital approval for its use; therefore this option was discussed with the patient. She agreed to an attempt with the new technique, but if unsuccessful did not consent to coronal incision and would rather accept the asymmetry.

Method

Following the bimaxillary osteotomy, left upper blepharoplasty incisions and transconjunctival incisions allowed access for trocars to pass 0.3-mm diamond-coated wire (Logitech Limited, Erskine Ferry Road, Old Kilpatrick, GLASGOW, G60



Fig. 1. Three-dimensional model of left zygomatic-orbital hypoplasia prepared for model surgery.

5EU UK) via the standard Le Fort I sulcus incision around the zygoma (Fig. 1). An oblique notch was created just inferior to the Zygomatic-frontal (ZF) using a fissure bur to mark the top of the osteotomy and to retain the loop of wire. After raising sub-

periosteal pockets, the 0.3-mm diamond-coated wire was passed under the zygomatic arch with a zygomatic awl and engaged into the ZF notch made by the fissure bur. It was then passed sub-periosteally with the same awl over the zygoma

to exit intraorally. The osteotomy was undertaken manually as would be done with a Gigli saw. The transconjunctival incision allowed visualization of the orbital rim and protection of the orbital septum (of note, this has been abandoned as unnecessary in subsequent patients). Once the wire had passed through, it was removed and discarded. The osteotomy thus created is 0.3 mm and the zygoma can be 'green-sticked' at the arch by gentle leverage at the buttress. A five-hole 1.7-mm Stryker plate was fixed with two 5-mm screws to the superior/zygomatic side, then the zygoma was flexed laterally by the desired pre-planned amount and fixed with two further 5-mm screws to the inferior maxillary side of the osteotomy. Fixation was also done at the orbital rim and ZF; however this is no longer considered necessary, as the buttress fixation plus sandwich of bone is adequate. A block of iliac autogenous bone was sandwiched and fixed in the osteotomy gap. Closure was performed by standard techniques (Figs 2–7).

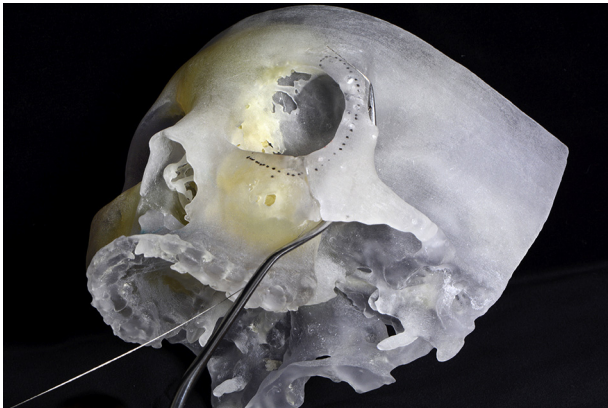


Fig. 2. Three-dimensional model demonstrating passing of the diamond wire with the zygomatic awl.



Fig. 4. Intraoperative view of upper blepharoplasty access to zygomatic-frontal suture.



Fig. 3. Intraoperative view of the maxillary buttress.

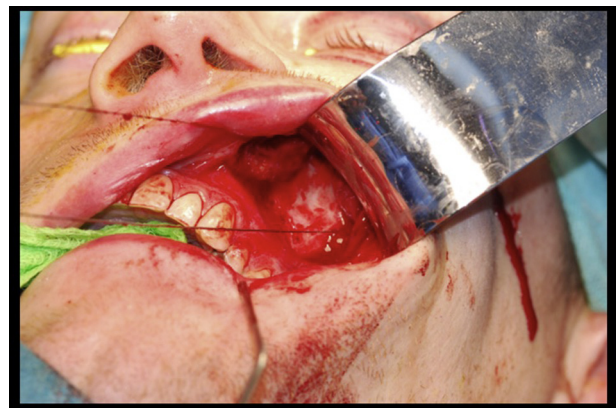


Fig. 5. Intraoperative view of the diamond wire engaged for zygomatic osteotomy.

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