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British Journal of Oral and Maxillofacial Surgery xxx (2016) xxx–xxx
BRITISH Journal of Oral and Maxillofacial Surgery
www.bjoms.com

Technical note

Entrapment of soft tissue: a new technique to improve the stability of malar augmentation with hydroxyapatite

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Accepted 20 November 2015

Keywords: Hydroxyapatite; Implants; Malar augmentation; Orthognathic surgery

As far as we know the first reports of the use of hydroxyapatite for malar augmentation were published in 1986.[1] Its use in the form of granules has since been shown to produce a more predictable result with fewer complications than implant blocks.[2] The granules also permit moulding after implantation, so that the material becomes compacted and approximates closely to the surface of the bone. Moulding is possible because the hydroxyapatite is packed under the periosteum and can be reshaped by pressure on the soft tissues. However, postoperative moulding can result in displacement of the granules through the subperiosteal pocket into the surrounding tissues, and this increases the risk of infection. Implanted granules can also be displaced spontaneously after washout by large haematomas, or under the natural pressure of the muscles during the first postoperative weeks.

The subperiosteal implantation of custom-made material through a "pocket" is well documented.[1] Here we describe a technique that prevents the implanted material from being displaced. For augmentation, we use hydroxyapatite-β-tricalcium phosphate mixed with microfibrillar collagen. Our addition to this is that we combine it with the use of an osteosynthesis screw and a fragment of plate to entrap the soft tissues at the surface of the bone and so close the subperiosteal "pocket", which reduces the possibility of displacement of the implanted granular material (Fig. 1). The osteosynthesis screw and the fragment of plate will not entrap the soft tissues permanently, and they will probably escape gradually from the entrapment when the muscle is active. However, even if the entrapment lasts for only two weeks it will have done its job, as the critical period is the first 14 days during which

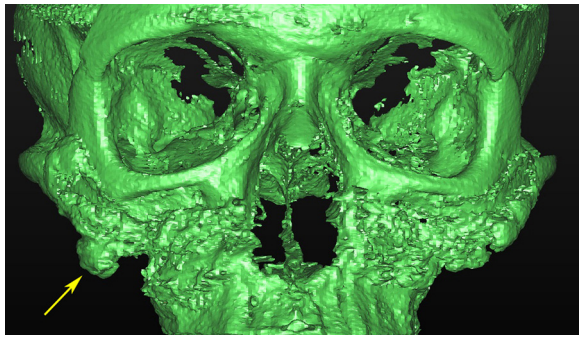

Fig. 1. Application of the hydroxyapatite granules without entrapment of soft tissue can result in early displacement of the implanted material (arrow).

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http://dx.doi.org/10.1016/j.bjoms.2015.11.022

Fig. 2. Augmentation of the cheek bone with porous hydroxyapatite: placement of the implanted material in the subperiosteal "pocket".

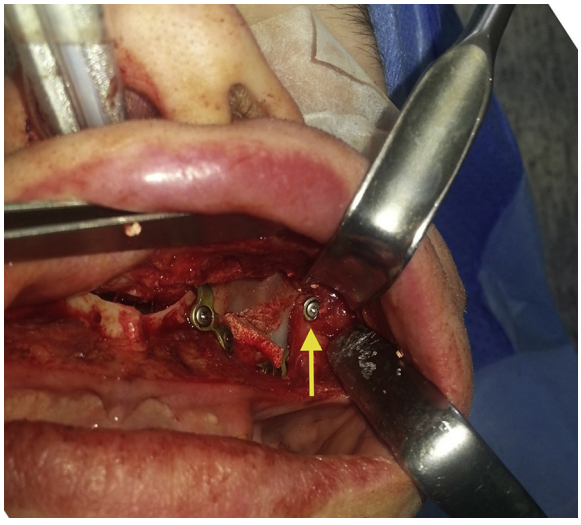

Fig. 3. Immediately after application of the hydroxyapatite and closure of the pocket with a screw and a fragment of ring (arrow).

formation of a haematoma can wash out the implanted material or careless handling can result in displacement of the material through the portal of entry.

A standard, strictly subperiosteal, vestibular incision is made to gain access to the malar and zygomatic regions. We mix hydroxyapatite-β-tricalcium phosphate granules about 2 g with sterile saline solution and microfibrillar collagen. The mixture is dried out in the shape of rods that are placed at the desired location under the periosteum (Fig. 2).[3] The opening of the "pocket" is closed with one screw and one fragment of a ring of an osteosynthesis plate (Fig. 3). The wound is closed according to the surgeon's preference.

To our knowledge, limiting the "pocket" with osteosynthesis screws has not been described previously. We have successfully used the technique in more than 80 cases and found that it is possible to mould the implanted material while limiting the risk of displacement of the granules. Because of

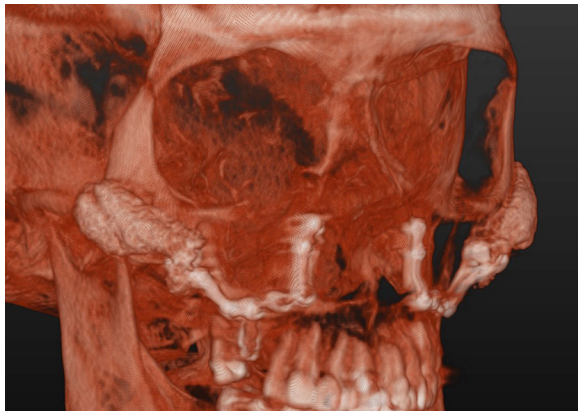

Fig. 4. Oblique view of cone-beam computed tomographic 3-dimensional volume reconstruction showing the implanted material on the surface of the malar bones successfully entrapped with an osteosynthesis screw and ring after 18 months' follow-up.

the surgical restriction of the "pocket", early moulding of the material is possible as soon as the swelling begins to subside. Once the position of the implanted material has been stabilised during the initial and critical first weeks, the material can shrink by 20% in the first year as a result of compaction, and remain stable for years (Fig. 4).[4,5] The long term outcome and prognosis are therefore likely to be improved by this easy, safe and quick technique.

Conflict of Interest

We have no conflict of interest.

Ethics statement/confirmation of patient's permission

Not required.

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Please cite this article in press as: Grybauskas S, et al. Entrapment of soft tissue: a new technique to improve the stability of malar augmentation with hydroxyapatite. *Br J Oral Maxillofac Surg* (2016), http://dx.doi.org/10.1016/j.bjoms.2015.11.022