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Technical note

Proposal for a new bone marker for maxillofacial surgery

C.M.S. Fernandes [a,b,*], M.C. Serra [b], P. Scolozzi [a]

[a] *Division of Oral and Maxillofacial Surgery, Department of Surgery, University of Geneva and University Hospitals of Geneva, Geneva, Switzerland*
[b] *Department of Community Dentistry, Faculty of Dentistry of Araraquara, São Paulo State University, Araraquara, SP, Brazil*

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The use of ink or dye to outline surgical approaches on the skin is common in plastic and reconstructive operations.[1] However, marking bone with ink or dye before an osteotomy is difficult because of the need for irrigation. Some surgeons use burs, which we do not recommend, because it could compromise thin bones, it is time consuming, and irreversible.[2]

Wooden pencils are ideal markers for hard tissue,[3] but they cannot be sterilised,[2,4] and they are straight, which would make access difficult in some surgical sites. We propose a new bone marker - a sterilisable, angulated instrument made of surgical stainless steel, with a changeable graphite point.

Fig. 1 shows a prototype of the proposed instrument. The angle can be regulated and set according to the needs of the surgeon. It has a body and a graphite camera, with a total length of 20.7 cm–16.7 cm and 4.0 cm, respectively. The diameter of the cross-section of the body part is 0.7 cm and, between this and the graphite camera, there is a screw that allows the angle to be changed. There is a ring that fixes the graphite point to the camera, and the prototypes are made in surgical stainless steel.

Our prototypes were tested during bone graft operations using dental implants, and in bimaxillary orthognathic operations (Figs. 2 and 3). They were precise and stable for the outlining of osteotomies, which were then completed with saws and burs.

Our bone marker can be used by different specialties. As skin markers decrease the risk of mistakes with incisions,[5] our instrument will help to make all operations on bone safer and more accurate, particularly maxillofacial ones.

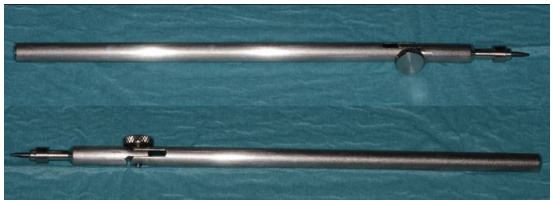

Fig. 1. Prototypes of the bone marker.

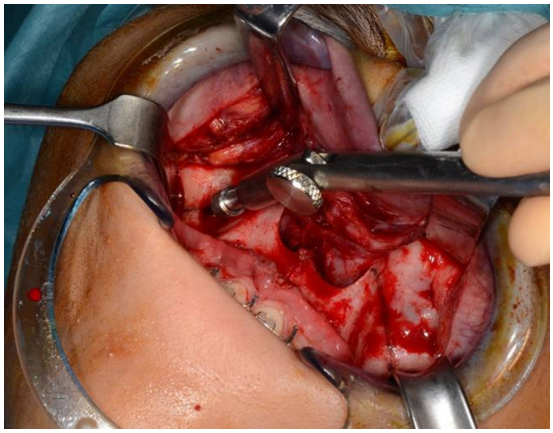

Fig. 2. Use of the proposed bone marker to outline a Le Fort I osteotomy.

We were also concerned with the ergonomic aspects of the device. We needed to insert a mobile angulation that was adaptable to different needs and surgical sites, and which facilitated access to mark the outlines of the osteotomy. Graphite points are also cheaper than pencils, they can be

* Corresponding author at: School of Dentistry, Araraquara, São Paulo State University, Rua Humaitá 1680, Araraquara, SP 14.801-903, Brazil. Tel.: +55 16 33016353/+55 16 997831222.
E-mail addresses: mcserra@foar.unesp.br, c.face@terra.com.br, monicaserra25@hotmail.com (C.M.S. Fernandes).

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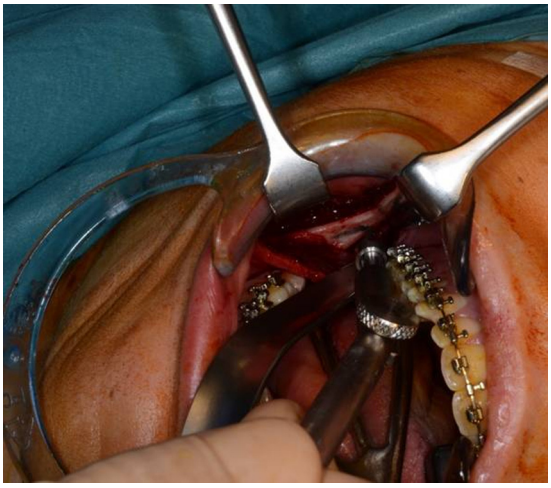

Fig. 3. Use of the proposed bone marker to outline a sagittal split osteotomy.

kept in small sterilisation bags until needed, and the bone marker itself could be part of the set of surgical instruments.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patients' permission

Not required.

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