“Bone Mapping/Sketching” in Management of Anterior Table Frontal Sinus Fracture

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Abstract

Purpose The aim of this present article was to know the efficacy of bone mapping/sketching in management of anterior table frontal sinus fracture.

Material and methods This prospective clinical study includes 10 patients who reported to department of dentistry, AIIMS Bhopal with anterior table frontal sinus fracture. Sterile plain white paper or a glove cover was used for mapping/sketching. The patients were evaluated for post-operative contour of the fractured frontal sinus defect and any mucocoele formation.

Results All the 10 patients had no infection or post-operative mucocoele formation and all have excellent aesthetic of the anterior table of the frontal sinus.

Conclusion Bone mapping/sketching should be done in all comminuted fractures of cranio-maxillofacial region.

Keywords Frontal sinus fracture · Anterior table · Bone mapping · Sketching

Introduction

In only 5–15 % of cranio-maxillofacial injuries the frontal sinus fracture occurs, out of which the percentage of iso-

lated anterior table fractures was 33 % [1]. Due to better understanding of frontal sinus fracture management and expertise development in endoscopic sinus surgery, the management has become much more conservative [2]. The endoscopic fracture reduction according to some surgeons is technically challenging [3]. Displacement, contour defect and comminuted anterior table warrant reduction and stabilization of these fracture fragments. We recommended the use of bone fragment mapping/sketching to arrange the comminuted bone fragments for better management.

In the comminuted fracture of frontal sinus (Fig. 1), it is mandatory to clean and debride the frontal sinus. The complete removal of sinus lining is to be done, to avoid post operative mucocoele formation. To regain excellent post operative contour each depressed fracture fragment (Fig. 2) is to be placed at the original position.

To do so a number should be given to each fracture fragment and the fragments should be kept over that particular number to avoid mismatch. The bone mapping or sketching is to be done on plane paper (Fig. 3). We usually use glove cover and a sterile skin marking pen for this purpose.

After proper curettage of sinus lining and debridement, the fracture fragments are placed over the defect followed

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Fig. 1 Comminuted frontal sinus fracture

Fig. 2 Depressed anterior table fracture

by fixation (Fig. 4). This helps in excellent post operative contour of the frontal sinus defect.

Advantages

1. Inexpensive
2. Requires less time
3. No expertise required

Discussion

The aim of this article was to present a technique of bone mapping in the management of anterior table frontal sinus fracture, which has not been documented in the literature till date.

Although many authors used similar techniques in management of other fractures, Armitage et al. [4] used three dimensional computed tomography models to create a scapular fracture map. Carsten et al. [5] used a software platform and mapping to reduce the fracture pre

Fig. 3 Bone mapping/sketching on a plane sterile paper

Fig. 4 Proper alignment of fracture fragments

operatively with the help of pre operative multimodal computed tomography (CT) data and transferred it to surgical navigation in the management of orbitozygomatic complex fracture management.

Sindwani [6] used virtual endoscopy for mapping the frontal sinus ostia, but the technique is time consuming and endoscopes are expensive. Schmitz et al. [7] used perimeter marking technique for rigid fixation of frontal sinus fracture. Hershman et al. [8] advocated 3 D virtual planning by medical modeling involving preoperative CT and virtual outlining of the boundaries of the frontal sinus confines in management of frontal sinus fracture. On the other hand the present technique requires a plane white paper and can be done in minutes.

Conclusion

To achieve excellent results, we routinely use the bone mapping/sketching in the management of comminuted frontal sinus fracture management. A similar technique can be used in the management of other comminuted maxillofacial fractures also.

Compliance with Ethical Standards

Conflict of interest The authors Anshul Rai, Adesh Shrivastava and Manal M Khan declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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