Innovative Intraoperative Titanium Mesh Preparation for Safer Implantation

Vigneswaran Nallathamby, MB BCH BAO LRCP/SI (NUI), MRCS (Edinburgh), MMED (Surgery)¹
 Hanjing Lee, MBBS (Singapore), MRCS (Edinburgh), MMED (Surgery)¹
 Jane Lim, MBBS (Singapore), FRCS (Edinburgh), FRCS (Glasgow), FAMS (Plastic Surgery)¹
 Wei Chen Ong, MBBS (Singapore), MRCS (Edinburgh), MMED (Surgery), FAMS (Plastic Surgery)¹
 Thiam Chye Lim, FRCS, FAMS, MBBS (Malaya)¹

¹ Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Health System, National University Hospital, Singapore

Craniomaxillofac Trauma Reconstruction 2013;6:65–66

Address for correspondence and reprint requests Vigneswaran Nallathamby, MB BCH BAO LRCP/SI (NUI), MRCS (Edinburgh), MMED (Surgery), Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, National University Hospital, 5 Lower Kent Ridge Road, S(119074), Singapore (e-mail: vancino@gmail.com).

Abstract

Keywords

- ▶ titanium mesh
- ▶ cut to shape
- ▶ sharp edges
- ▶ file edges
- ▶ tip cleaner
- ▶ scratch pad

Titanium meshes have been extensively used in craniomaxillofacial surgery. The benefits of these titanium implants include being inert, stable, and radiopaque and having good drainage properties. The titanium mesh is cut to shape and bent before implantation, which may give rise to the cut edges being jagged and sharp. This can lead to soft tissue being caught or lacerated by these sharp ends. A change in technique to cut and shape the implant may reduce this problem. The implant should be cut right at the end of the bars flush with the remaining parts of the implant. We present a new and simple method for smoothing these troublesome edges. We use the diathermy scratch pad or tip cleaner, a tool used frequently in every major surgery. This scratch pad can be used as a rasp to smoothen the edges of the titanium mesh once it is cut into shape.

Dear Sir,

Titanium meshes are used extensively in craniomaxillofacial surgery. They are the mainstay for orbital floor and cranial reconstruction. They are inert, stable, and radiopaque and have good drainage properties that also encourage good tissue ingrowth.^{1,2} These implants come in various shapes, sizes, and types and may be combined with polyethylene (e.g., Titan implants; Medpor®; Newnan, Georgia). Precontoured orbital implants (e.g., from Synthes®; Suzhou, Shanghai, China) have made it easier to repair orbital floor defects.

During the surgical procedure, the titanium mesh is cut to shape and bent before implantation. The cut edges tend to be jagged and sharp.^{1–3} This can lead to soft tissue being caught or lacerated by these sharp ends. This problem would have most impact in orbital floor reconstruction. If the periorbital fat or recti muscles are caught onto the implant, the move-

ment of the eye will be restricted, resulting in pain, diplopia, and possible fibrosis of the soft tissue. A similar situation can happen in reconstruction of the cranium. These sharp ends exert pressure onto the overlying tissue and skin leading to pressure necrosis and implant extrusion.⁴

A way to reduce this problem is a neat, concise technique in cutting the implant to shape. These implants consist of a pattern of straight connecting bars between the screw holes (▶Fig. 1). The implant should be cut right at the end of the bars flush with the remaining parts of the implant. This ensures there are no protruding shortened bars that lead to the complications mentioned earlier. Even in the best of hands, tiny sharp edges remain (▶Fig. 2).

A bone file or bone rasp reduces and smoothes the edges but leads to early wear and tear of those instruments. Conversely, these instruments may be so sharp as to take

received

January 18, 2012

accepted after revision

March 15, 2012

published online

January 15, 2013

Copyright © 2013 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA.
 Tel: +1(212) 584-4662.

DOI <http://dx.doi.org/10.1055/s-0032-1329544>.
 ISSN 1943-3875.

Figure 1 Titanium implant.

Figure 2 Sharp edges after cutting implant to shape.

Figure 3 Using the scratch pad to file down sharp edges.

off more titanium than intended or necessary, weakening of the implant. The large particles getting into the wound can lead to foreign body reaction or infection.

We present a new and simple method for smoothing these troublesome edges, which renders the usage of titanium mesh safer without the aforementioned problems encountered with bone rasp. We use the diathermy scratch pad or Devon Tipolisher® (Madrid, Spain), a tool used frequently in every major surgery. It is readily available, cheap, and has a more delicate abrasive surface compared with the bone rasp. This scratch pad can be used as a rasp to smoothen the edges of the titanium mesh once it is cut into shape (►Fig. 3). This rounds off the sharp edges and removes tiny fragments from the implant, making the cut edge safer to be used.

References

- 1 AO Foundation website. Midface orbital floor fracture—orbital reconstruction. Available at: http://www2.aofoundation.org/wps/portal/surgerymobile?showPage=redfix&bone=CMF&segment=Midface&classification=92-Orbit,%20Orbital%20floor%20fracture&treatment=operative&method=Open%20treatment&implanttype=Orbital%20reconstruction&approach=&redfix_url. Accessed March 12, 2009
- 2 Janecka IP. New reconstructive technologies in skull base surgery: role of titanium mesh and porous polyethylene. *Arch Otolaryngol Head Neck Surg* 2000;126:396–401
- 3 Merbs SL, Iliff NT, Grant MP, Garibaldi DC. Use of MEDPOR TITAN Implants in orbital reconstruction. [E-Abstract] *Invest Ophthalmol Vis Sci* 2005;46:4210–4568
- 4 Zanetti D, Nassif N. Transmastoid repair of minor skull base defects with flexible hydroxyapatite sheets. *Skull Base* 2003;13:1–11