IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 12 Ver. 8 (December. 2018), PP 75-77
www.iosrjournals.org

Customized Surgical Plate-Screw Holder- A step towards efficiency enhancement

*Dr. Mohammad Ansari[1], Dr. Ankita Mutha[1], Dr. B. M. Rudagi[2]
1-M. D. S. (Post-graduate student, Oral and Maxillofacial Surgery, A.C.P.M Dental College, Dhule)
2- M. D. S.(Professor and Head of the Department, Oral and Maxillofacial Surgery, A.C.P.M Dental College, Dhule)
Corresponding Author- Dr. Ankita Mutha

Abstract: *Routinely performed Oral and Maxillofacial Trauma Surgeries involve the use of various surgical Plates and Screws of varying dimensions. The surgical screws and plates used in the surgeries are available in different dimensions and its use requires a highly skilled professional. They are often found scattered over the surgical table due to their small sizes and unavailability of adequate storage products in the market. Often easily misplaced, or the cause of medical negligence due to use of wrong screw dimensions, most of the time leading to waste of time during the operative procedure. The Purpose of this study was to evaluate the efficiency of an innovative Surgical Plate-Screw holder to help the Surgeon to save time during the operative procedure and reduce the stress of the operators by making the instruments easy to identify, handle and use.*

Key words: *Maxillofacial trauma, surgical plate, surgical screw, surgical plate-screw holder.*

Date of Submission: 08-12-2018 Date of acceptance: 24-12-2018

I. Introduction

Maxillofacial trauma is common and can cause significant functional and aesthetic alterations. The main objective of treatment for facial fractures is restoration of the structure and function, which requires adequate fracture reduction and immobilization. The techniques have ranged from closed reduction with maxillomandibular fixation (MMF), to open reduction with wire osteosynthesis, to open reduction with either rigid internal fixation or adaptive miniplate fixation using screws.

According to the site and extent of the fracture, the operating surgeon decides on what type and dimension of the plate and screw to be used for the fixation of the fractured segment. During the operative procedure, due to the unavailability of adequate storage systems for screws and plates, they are often found scattered on the operating table. Screws and plates of various sizes are kept together on the operating table and when the surgeon needs a particular screw of a particular dimension, the assistant is unable to hand it over to the surgeon, leading to operator stress and waste of time during the operative procedure. Most of the time, the screws of a particular dimension are not in stock with the operator and the operator realizes that during the procedure leading to more stress and delay. Even when available, handing over of the screw to the operator becomes difficult for the assistant as it needs right amount of skill to handle those screws of small sizes and engaging them in screw holder. In order to counteract this problem and reduce the stress of the operator as well as the assistant, we came up with a innovative product called as the Surgical Plate-Screw Holder which organizes the screws according to their available dimensions and easy to handle. Saving the time of the operator during the procedure and also reduce operative time for the patient.

II. Material used for the fabrication of Surgical Plate-screw Holder

The materials used are as follows:

- Empty Can
- Surgical Screws of Different Sizes
- Straight Hand Piece
- Drill-bit of 1.3mm,1.5mm,2mm Sizes
- Screw Driver

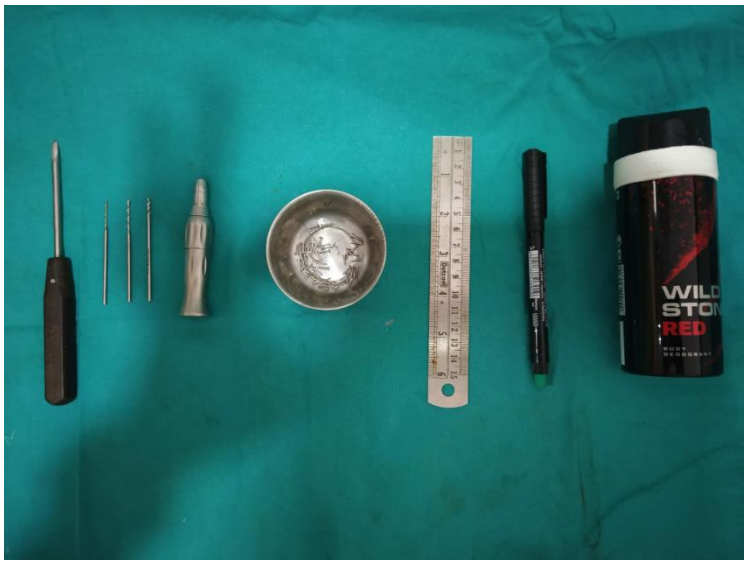

Fig. 1. Armamentarium required for the fabrication of surgical plate-screw holder

III. Method Of Fabrication of plate-screw holder

Take an empty spray can and make sure that the can is devoid of any gaseous or liquid substances. Using a stainless steel measuring scale, draw horizontal and vertical lines over the can. Each line should be at equal distance to each other and maintaining adequate space according to user convenience. At each intersection, using a straight handpiece and drill-bit, holes are made to suit the screw of the size which will fit into the hole. Drill-bit of various sizes are used to make holes into the can.

Fig. 2. Surgical plate-screw holder

For a screw of 1.50 mm size, a drill bite of size 1.10 to 1.30 mm is used, for a screw size of 2.00 mm, we can make holes using 1.50-1.70 mm size drill-bit and for a screw size of 2.50 mm, drill-bit of size 2.00 mm is used. Separate columns are made over the can which will store particular size of the screws used in Oral & Maxillofacial trauma surgeries. For example, 1.50x6 mm screws, 1.50x8 mm screws, 2.00x6 mm screws, 2.00x8 mm screws, 2.00x10 mm screws, 2.50x8 mm screws, 2.50x10 mm screws. At the bottom of the can, few extra holes are made to store screws to be used in case of emergency. Markings are made over the can which will indicate which screw to be kept in which column. According to the sizes, the screws are placed into the cans using the screw holder, half the length of the screw goes inside and half is left outside so as to easily access the screw onto the screw driver directly while doing the operative procedure. It helps to easily identify the screw as the dimensions are marked over the column in which the screw is placed. Easy to access for the surgeon as well

as the assistant. The cap of the can is removed so as to store plates of varying sizes and the entire thing is readily autoclaved as the product is made of metal.

IV. How to Use

All the screws are fitted into the can using the screw driver, autoclaved and available for use. During the operative procedure, the screws to be used are easily accessible for the operating surgeon and the assistant because of the markings present over the can denoting the dimension of the screws. Each screw is placed at an equal distance and are easily accessible. Using Screw holder, the operator directly engages the screw and rotates to remove it from the hole, saving time and improving work efficiency at the same time.

V. Advantages

- Easy to Handle.
- Decreases stress of the operating surgeon and the assistant.
- Improved accessibility of the screws and plates.
- Easy to locate and identify.
- Can be autoclaved.
- Reduces operative time and improves work efficiency.

VI. Discussion

Surgical Plates-Screw holder is a unique innovation to organize and manage the available instruments and help the Operating surgeon and assistant during the surgical procedure. Instrument boxes of various shapes and sizes with engraved markings are available in the market to store screws and plates, which are not much cost effective and most of the times cannot be autoclaved. Even if available in autoclavable boxes, the size of the box to store the screws of various sizes isn't sufficient and if any screw gets misplaced into the box of screw of different dimension, it becomes difficult to identify. In order to overcome this, we have made a surgical plate-screw holder which is cost effective and easy to fabricate.

VII. Conclusion

The Surgical Plate-Screw Holder can be quite helpful in arranging, organizing and managing the available instruments. Often the screws are out of stock and the operator realizes during the operative procedure, by using this product it's easy to keep a track of the missing screws and plates. It reduces the unnecessary mess on the instrument table in the operating theatre.

FINANCIAL SUPPORT AND SPONSORSHIP

No funding was received for this study.

CONFLICT OF INTEREST AND INFORMED CONSENT

There is no conflict of interest. This article does not contain any studies with animals or humans performed by any of the authors.

References

[1]. Adam R. Dyas, Kelly M. Lovell, Courtney J. Belentine, Thomas N Wang, Herbert Chen. Reducing cost and improving operating room efficiency: examination of surgical instrument processing. Journal of surgical research _ semptember 2 0 1 8 (2 2 9) 1 5e1 9.

[2]. Harders M, Malangoni MA, Weight S, et al **Improving operating room efficiency through process redesign** (MetroHealth Med Ctr, Cleveland, Ohio) *Surgery(2006)* 140:509-516.

[3]. Robert R Cima, Michael J Brown, James R Hebl, Robin Moore. J Am Coll. Use of Lean and Six Sigma Methodology to Improve Operating Room Efficiency in a High-Volume Tertiary-Care Academic Medical Center .Surg 2011;213:83–94. © 2011 by the American College of Surgeons.

[4]. Dhaka RS, Shukla AK, Maniraj M, D'Souza SW, Nayak J, Barman SR. An ultrahigh vacuum compatible sample holder for studying complex metal surfaces. Rev Sci Instrum. 2010 Apr;81(4):043907.

[5]. Choen SR, Holmes RE, Amis P, Fitchner H, Shusterman EM. Tacks: a new technique for craniofacial fixation. J Craniofac Surg. 2001 Nov;12(6):596-602.

[6]. Ganesan SK, Thandapani BS, Jude NJ, Rajendiran S, Thomas SJ. Modified orthopedic wire twister for fixing and removing screws in craniomaxillofacial osteosynthesis. Natl J Maxillofac Surg. 2017 Jul-Dec;8(2):170-171.

*Dr. Mohammad Ansari. "Customized Surgical Plate-Screw Holder- A step towards efficiency enhancement"." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 12, 2018, pp 75-77.