

## Bringing Back to Life: Complete Rehabilitation of a Facial Injury Case

**Bhushan Kumar<sup>1\*</sup>, Prabhdeep Kaur Sandhu<sup>2</sup> and A Navin Kumar<sup>3</sup>**

<sup>1</sup>Graded Specialist, Department of Prosthodontics, Army Dental Corps, India

<sup>2</sup>Department of Orthodontics, Private Consultant, Ambala Cantt, Haryana, India

<sup>3</sup>Graded Specialist, Department of OMFS, Army Dental Corps, India

**\*Corresponding Author:** Bhushan Kumar, Graded Specialist, Department of Prosthodontics, Army Dental Corps, India.

**Received:** November 16, 2018; **Published:** December 18, 2018

### Abstract

Facial appearance is most desired thing by any individual because human race is most socialised among all living creatures. At the same time it is most vulnerable to injuries being the most exposed part of the human body. Isolated blast splinter injuries of the face are rarer. This article is presenting a case of 32 years old serving soldier who suffered from an extensive facial injury due to blast of explosive; where high speed splinter sliced the midface diagonally into two; resulting in tissue and dento-alveolar loss. The complete rehabilitation process of the case is discussed in this article.

**Keywords:** Facial Blast Injury; Splinters; Dento-Alveolar Defect; Dental Implants

### Introduction

Face is vital part of human body, in terms of esthetics and is responsible for various essential functions like breathing, speech, eating and drinking etc. Any trauma in this region affects both the appearance and function. These sudden changes lead to a major psychological impact [1].

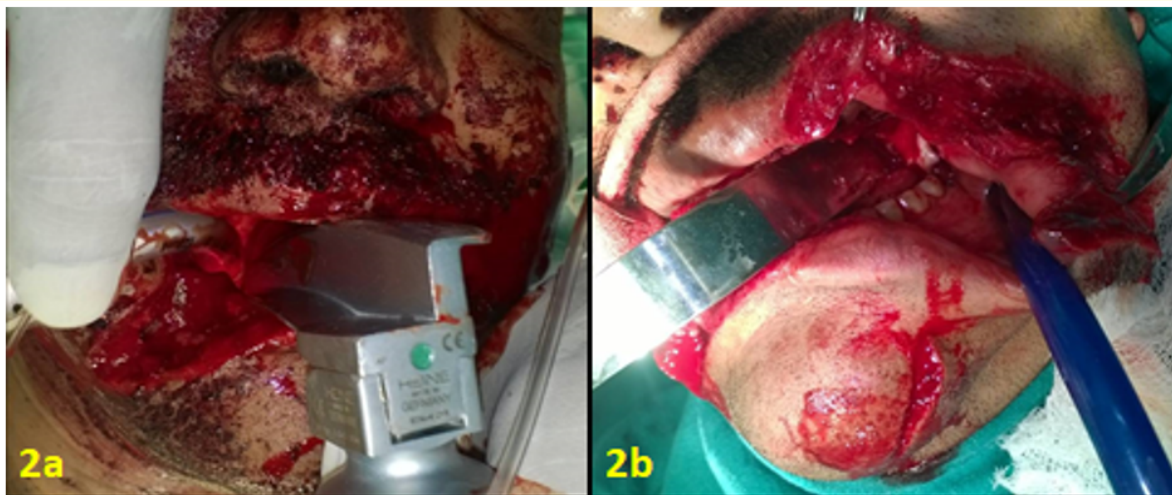
Modern high speed mechanical world has made facial injuries extremely common due to increased incidence of vehicular trauma, industrial trauma, assault etc [2]. Facial isolated injury due to splinter from explosive during combat is common in defence forces and extent of damage to the tissues decides the rehabilitation outcome. It can involve injuries of the skull, facial bone fracture and other associated soft tissue injuries, damage to the airway or other vital structures of neck [3,4].

### Case Report

A 32 years old serving soldier was deployed in a combat zone and after a nearby explosion the metal splinter travelled in air at high speed and hit the individual on right cheek and exit on the left, leaving the face sliced into two halves in midface region (Figure 1). Individual got collapsed and was brought to the Military Hospital by fellow soldiers. Oral examination showed perforated lacerated wound in facial soft tissue combined with loss of dento-alveolar segment in fourth and second quadrant due to high velocity diagonal impact, leaving the skin flaps hanging outwards and the buccal vestibule in continuation with external environment (Figure 2a). Small laceration wound was present in the chin region also. No other facial or neck injury was noticed (Figure 2b).



**Figure 1:** Pre-operative State in which patient was received.



**Figure 2:** Pre-operative evaluation for extent of damage.

After stabilising the vitals, the injury site was examined by Oral and Maxillofacial Surgeon and found no facial bony fracture except dentoalveolar segment in second and fourth quadrants which were missing from the oral cavity except third molar in maxillary left quadrant which was hanging in fractured tuberosity. Immediate management included the thorough cleaning of raw wound and intraoral suturing of soft tissue over fracture alveolar process using 4-0 silk sutures. Periosteum of fractured tuberosity was detached from the adjacent part and third molar had lost its bony socket so this portion was discarded. The external facial wound was closed in layers; mucosal layer first (4-0; absorbable), followed by connective tissue layer (4-0; absorbable) and outer skin layer in last (4-0; Nonabsorbable) for getting best postoperative esthetic results (Figure 3). The external sutures were removed on tenth postoperative day and a satisfactory healing was noticed (Figure 4a).



**Figure 3:** Three layer suturing for lacerated wound.

Patient was kept under follow up visits on OPD basis for evaluation of healing process (Figure 4b). Though patient had got very good esthetic results in facial injury region but the disquiet finding noticed on every visit was the psychological impact of the incidence on patient's mind. The case was then referred for psychological counselling. The comments from the psychiatrist helped the dental rehabilitation team in enumerating their treatment plan. The comments were "though patient had undergone a tragic moment leading to distress but this is accentuated on daily basis by his disability caused after this incident and it is his inability to chew his food".



Figure 4: a- Healing after 10 days (on day of suture removal), b- Healing after 1 month.

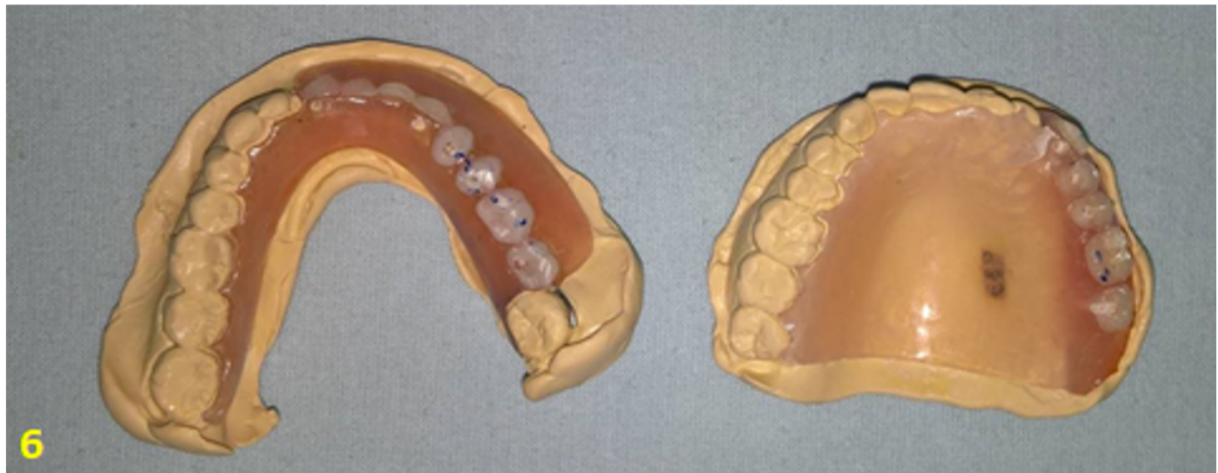
Clinically, patient did not have either of right or left occlusal contacts owing to the loss of second and fourth quadrants (Figure 5). It had put major challenge in front of dental team to bring back individual in main stream by restoring his physiologic oral functions. After a careful clinical and radiographic examination, fixed replacement using dental implants was finalised. The details of phased treatment steps are as follows.



Figure 5: Intraoral pre-prosthetic clinical presentation.

**Phase 1: Pre-Surgical Phase**

- Oral prophylaxis was carried out and patient was educated for oral hygiene procedures.
- An Interim RPD was fabricated (same was used later as a stent during dental implant placement) (Figure 6a).
- OPG revealed following significant findings: fracture lines in the left sinus floor were still evident, bony septum in 26 region was dividing sinus in two parts and the bone height in 25 region was 5.5 mm while in 26 and 27 it was 3.0mm. Sinus lift was only option to gain adequate bone for dental implants in second quadrant (Figure 6b).

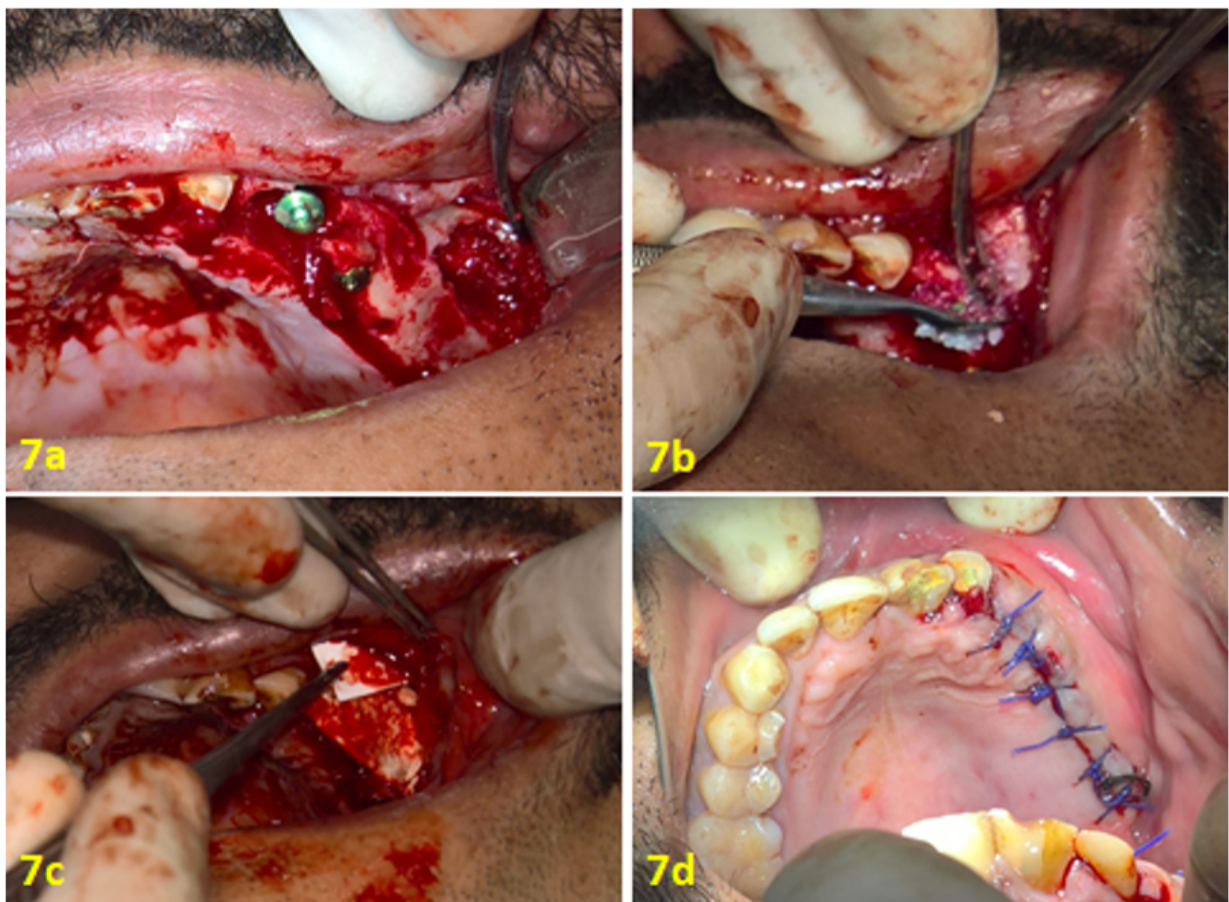


**Figure 6:** a- Interim Removable Partial Denture, b- Radiographic presentation (OPG).

**Phase 2: Surgical Phase (Direct Sinus Lift with Immediate Dental Implant Placement).**

**Maxillae:** after giving local anaesthesia a full thickness buccal flap was raised over the zygomatic buttress in 26 and 27 region. Piezo-surgical unit was used to create window opening (kept slightly bigger in diameter due to presence of bony septum in that part).

- Standard procedure of membrane lifting was followed and osteotomy for implant site was carried out. Bone graft material (Bio-Oss- xenograft -Geistlich Biomaterials, Switzerland) was filled in sinus cavity before placement of dental implant (Biohorizons-Tapered Internal). Four implants were placed in 23, 24, 25 and 27 region. Sinus window is packed with bone graft material and covered with Colo-guide Collagen GTR membrane (Cologenes Healthcare Pvt Ltd) and mucosal flap sutured back (Figure 7).
- The patient was prescribed with antibiotic and anti-inflammatory medication.



**Figure 7:** Steps of Maxillary sinus lift and immediate implant placement.

**Mandible:** after a gap of fifteen days to prior surgery, five implants were placed in mandible (31,43,44,45,47 region) through standard implant placement procedure (Figure 8).

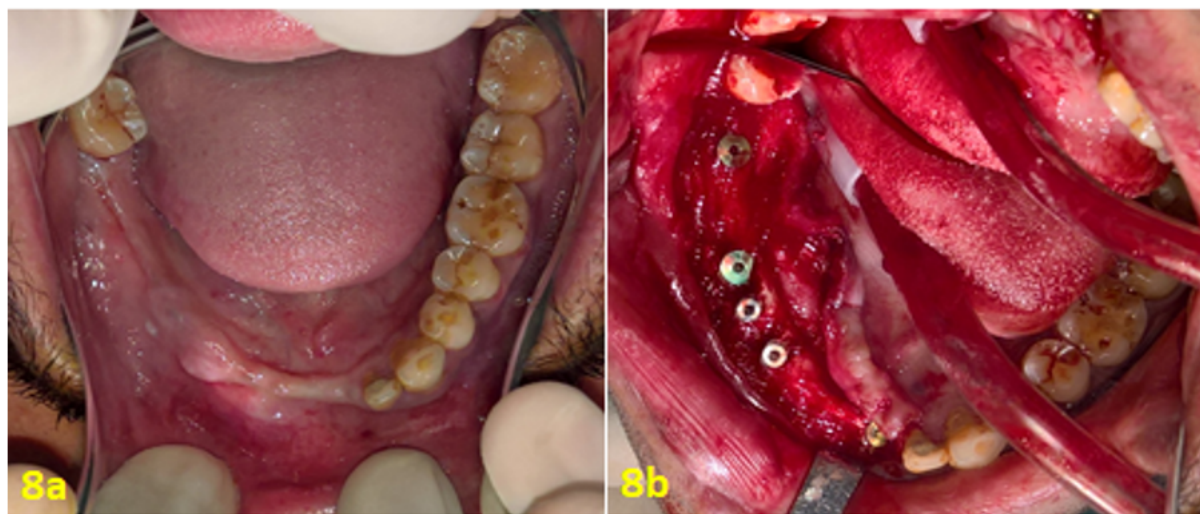


Figure 8: Steps of mandibular implant placement.

**Phase 3:** Post-surgical healing phase

- Interim RPD was given during this phase.
- Patient was periodically monitored for five months and checked for healing process. Implants were then exposed in second stage surgery. ISQ (Implant Stability Quotient) value was found between 74 - 80 and was adequate enough to enter in prosthetic replacement phase (Figure 9).

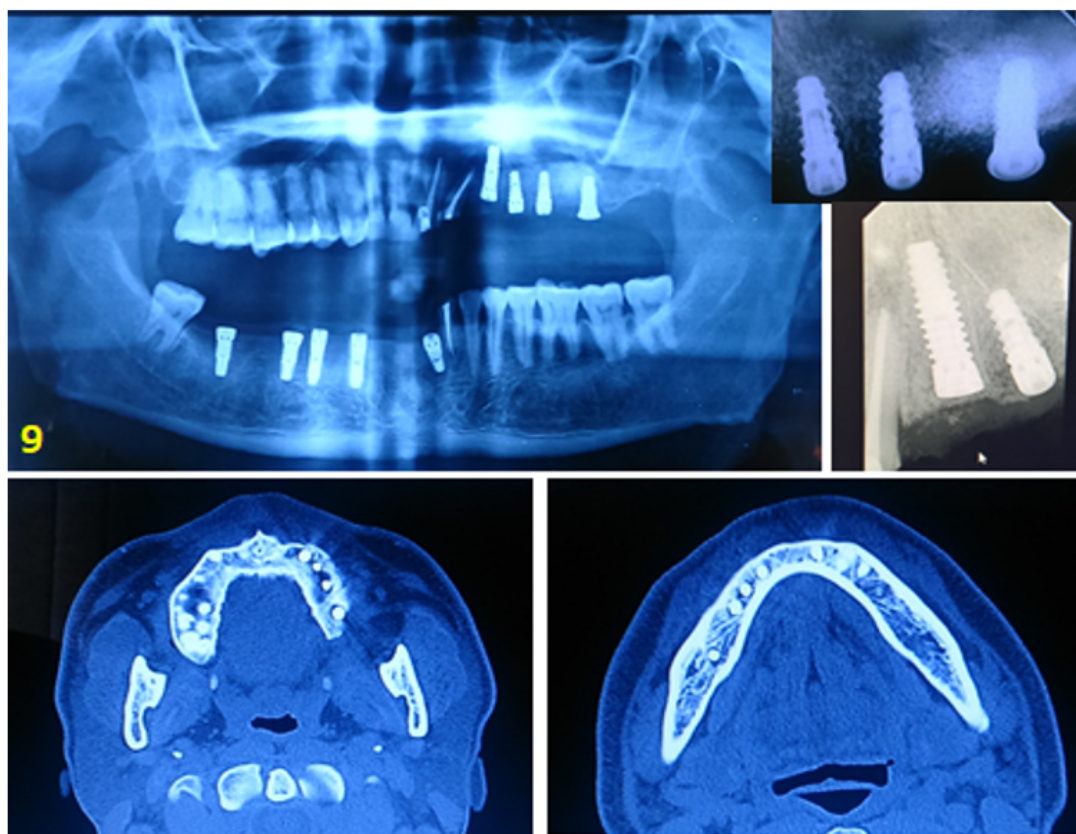


Figure 9: Radiographic presentation after five months.

**Phase 4: Prosthetic Phase**

- RCT was performed on 21, 22, 32.
- Zirconia (C-Zar) FPD was fabricated. Details are: single crowns over 21, 22; five unit implant supported cement retained bridge over 23-27; single crown on 32, four unit implant supported bridge over 31-43 region and four unit implant supported bridge over 44-47 region.
- Group function occlusal scheme was adopted for this particular case as implant prosthesis was opposing natural dentition (Figure 10).
- Importance of hygiene maintenance was emphasised to the patient for long term treatment success and use of Superfloss was demonstrated for cleaning the interdental areas and below the tissue surface of pontic.



**Figure 10:** Post-prosthetic intraoral view.

**Phase 5: Follow up Phase**

- Patient was recalled on weekly basis for the first one month followed by three months visit annually. Oral hygiene maintenance was reinforced during each follow up visit.

**Treatment outcome:** Excellent esthetics and occlusion achieved. Patient was very happy and has started living normal life (Figure 11 and 12).

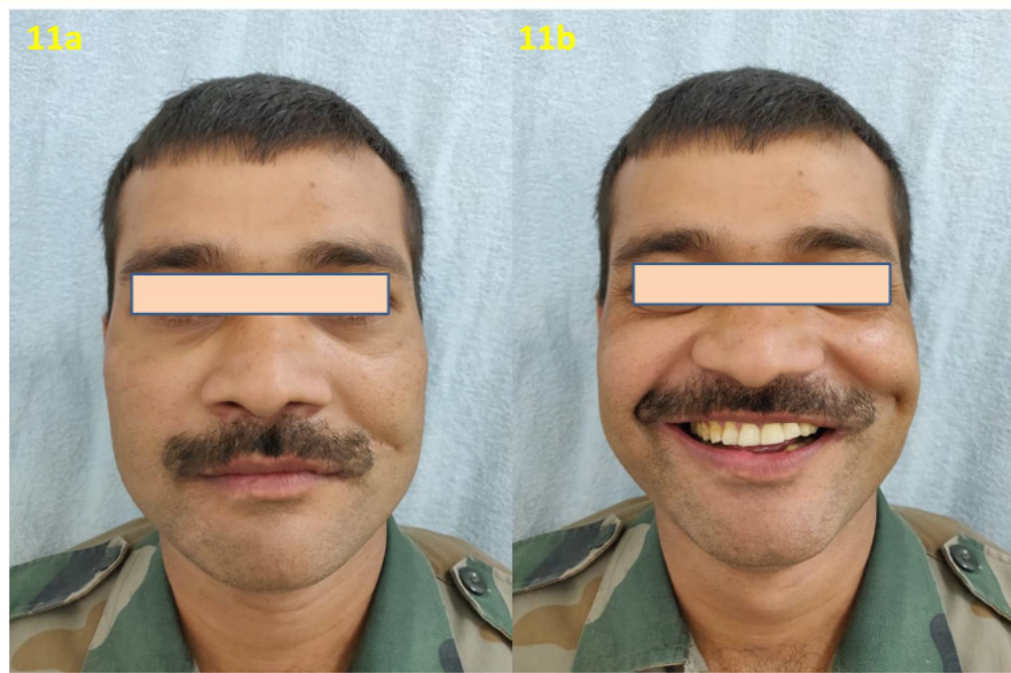


Figure 11: Final outcome of treatment (no facial scarring, esthetic smile).



Figure 12: Radiographic presentation after 1 year of completion of treatment.



### Discussion

The psychological impacts after facial trauma could be because of disability or facial disfigurement left over after healing. This correlation was first noticed in military veterans and survivors of disasters [1-4]. This underlying stress factor also termed as Post Traumatic Stress Disorder (PTSD) goes unnoticed in most of the cases [4,5]. The etiology includes the memory of the incident and disability or disfigurement post healing especially when face is involved [6].

Careful evaluation of wound, thorough debridement and removal of debris/foreign material and necrotic tissue followed with layer by layer suturing can reduce fibrosis. Suture material and needle size as well as thread diameter plays a role in achieving esthetic healing. In full thickness facial lacerations suture the inner most mucosal layer first. Use absorbable 3-0 or 4-0 chromic sutures, give minimum sutures needed to approximate the edges (care should be taken not to include muscle or underlying tissue and edge should be everted out). By doing so the oral cavity is separated from the raw wound. Irrigate the wound again and suture the connective tissue layer with 4-0 or 5-0 absorbable sutures if thickness is sufficient or else suture connective tissue and skin in one layer using 4-0 or 5-0. Nonabsorbable sutures are preferred as they hold skin better under muscle pull and for a longer time [7,8].

With the advancement in dental implantology, the results are very promising even in compromised cases and Implants have become treatment of choice for replacement of missing teeth. Sinus lift procedures are very common in deficient alveolar bone height in posterior maxillae. Careful treatment planning, adequate number of Implants and good prosthesis with desired occlusion are the key to success in dental implants [9,10].

### Conclusion

This article demonstrates how early intervention and careful execution of each simple step during treatment procedure can help in achieving excellent esthetic results and restoration of lost physiologic function and these were the game changer for the patient in bringing back him to normal life from psychologically distressed state.

### Bibliography

1. Islam S., *et al.* "The association between depression and anxiety disorders following facial trauma: A comparative study". *Injury* 41.1 (2010): 92-96.
2. Singh SK., *et al.* "Extensive facial damage caused by blast injury arising from 6 volt lead accumulator". *British Journal of Plastic Surgery* 52.2 (1999): 149-151.
3. Danic D., *et al.* "War injuries to the head and neck". *Military Medicine* 163.2 (1998): 117-119.
4. Avinash De Sousa. "Psychological issues in acquired facial trauma". *Indian Journal of Plastic Surgery* 43.2 (2010): 200-205.
5. Shetty V., *et al.* "Psychological sequelae and correlates of orofacial injury". *Dental Clinics of North America* 47.1 (2003): 141-157.
6. De Sousa A. "Psychological issues in oral and maxillofacial reconstructive surgery". *British Journal of Oral and Maxillofacial Surgery* 46.8 (2008): 661-664.
7. RV Kishore Kumar., *et al.* "A Clinician's Role in the Management of Soft Tissue Injuries of the Face: A Clinical Paper". *Journal of Maxillofacial and Oral Surgery* 12.1 (2013): 21-29.
8. Luluah Al-Mubarak and Mohammed Al-Haddab. "Cutaneous Wound Closure Materials: An Overview and Update". *Journal of Cutaneous and Aesthetic Surgery* 6.4 (2013): 178-188.

9. Tarun Kumar AB and Anand U. "Maxillary sinus augmentation". *Journal of the International Clinical Dental Research Organization* 7.3 (2015): 81-93.
10. Sahana Purushotham., *et al.* "Direct Sinus Lift and Immediate Implant Placement Using Piezosurgical Approach- A Case Report". *Journal of Clinical and Diagnostic Research* 10.1 (2016): ZD20-ZD22.

**Volume 18 Issue 1 January 2019**

**©All rights reserved by Bhushan Kumar., *et al.***