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CASE REPORTS

# *Post-traumatic Implant Surgical Rehabilitation of the Alveolar Ridge of the upper Jaw.*

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## *Abstract*

***Introduction;*** Dental trauma can be defined as an injuryto the oral region including the lips, teeth, periodontal tissues, tongue and/or alveolar processes.

*The aims* of management will depend on the age of the patient, type of tooth (primary or permanent) and the extent of the injuries. The treatment varies from preserving the tooth,extraction of the tooth and immediate implant placement. Immediate implantation is defined as placement of the implant into alveolus of the extracted teeth immediately after extraction.

***Materials and methods;*** A 45-year-old patient, suffered teethand dental bridge fracture and injury during car accident.Immediate teeth extraction was performed and immediate implantation with bone ridge preservation was performed, to rehabilitate the lost teeth. Patient underwent successfully for prosthetic rehabilitation 8 months after these procedures.

***Conclusion;*** Affected traumatized teeth often have areduced prognosis and, in some instances, may requireextraction. The majority of dental trauma is initially seenwithin a primary rather than secondary care setting. General dental practitioners should therefore be able to effectively manage the most common dental injuries, and to referthe complicated ones to oral surgeon. Dental implants are reliable to replace teeth lost because of traumatic dental injury. The timing of implant placement may be immediate, early, conventional, or late and is determined by the extent of the trauma, remaining growth, and conditions of the hardand soft tissues.

***Keywords;*** Dental trauma, implant placement, Branemark protocol.

## *Introduction*

Dental trauma can be defined as an injury to the oral region including the lips, teeth, periodontal tissues, tongue and/or alveolar processes. [1] The aims of management will depend on the age of the patient, type of tooth (primary or permanent) and the extent of the injuries.[2]

The timing of implant placement after traumatic dental injuries in adults also depends on the extent of the trauma and the local anatomic conditions at the implant site. In case of tooth avulsion without any damage to the supporting hard and soft tissues, the condition can be compared with a tooth extraction, and the timing of implant placement can be planned accordingly.[3, 4] The treatment varies from preserving the tooth, extraction of the tooth and immediate implant placement.[5, 6] The timing of implant placement after tooth extraction may be categorized as immediate placement (type 1), within 24 hours after extraction; early (type 2), after 6–8 weeks; conventional (type 3), after 3 months; and late (type 4), after more than 6 months.

Immediate implantation is defined as immediate implant placement on the same day as dental trauma and tooth extraction. Immediate implant placement is rarely a realistic scenario because traumatic dental injury is never planned. [1, 10]

However, an immediate approach can be considered if the patient reports to the clinic with an avulsed tooth, or teeth

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that could not be localized or with a non-restorable tooth remnant and if the following conditions apply: intact the implant into alveolus of the extracted teeth immediately after extraction. Socket walls and a facial bone wall thickness of at least 1 mm, thick soft tissue phenotype, no acute infection at the implant site, and bone apical and palatal to the socket are needed to provide ideal primary implant stability. [7, 10] If these conditions do not apply, immediate implant placement will be prone to an esthetically displeasing retraction of the facial mucosal margin and implant failure. In order to achieve successful results in such cases, the extraction needs to be done very carefully preserving both the bone as well as the surrounding soft tissues. [9, 10]

It should be noted that in such cases of immediate implantation it must be combined with augmentation techniques, in order to maintain the result over a longer period of time.

## *Materials and Methods*

A 45-year-old patient, suffered teeth and dental bridge fracture and injury during minor car accident. The fracture was due to abnormal biting force during the car crash (Picture 1 and 2).

The patient was conscious with no other soft tissue injuries. A panoramic image and 3D CBCT were performed preoperatively. Analyzes showed that the dental bridge in the upper jaw was fractured at positions 13 and 23. (Picture 3). There was also a horizontal root fracture of teeth 13 and 23, and an avulsion of tooth 11. (Picture 4, 5, 6). Alveolar ridge dimensions in all directions indicated that this was a borderline case for immediate implantation. Therefore, atraumatic operative extraction of all teeth in the upper jaw had to be performed with little trauma to the soft and hard tissues. Also, the implantation had to be combined with augmentation techniques to preserve the remaining bone tissues. Such conditions required the prosthetic rehabilitation to be performed 6-8 months after implantation. Patient reported no other medical conditions and diseases, that might affect the treatment.

### *Surgical protocol*

Local plexus anesthesia (Artinibsa 4%, Inibsa Spain), was administered in the upper jaw. Surgical extraction of the teeth 18,13,11,22,23,28 was performed. (Picture 7). A crestal incision was made and mucoperiosteal flap was elevated. (Picture 8). In the region of 15, a preparation for the placement of a 3.75 x 12mm implant was performed with primary stability of 76 ISQ achieved. Immediate implantation was performed in the area of tooth 13, with a slight palatal approach (Picture 10)

An implant with dimensions of 3.75 x 12 mm was placed. Due to the width of the gap, which did not exceed 2 mm, no bone augmentation was performed in this zone. Immediate implantation was also performed at positions 11 and 23, and two 3.75 x10mm implants were placed. (Picture 9 and 11). Mediate implantation was performed at position 25 with dimensions 3,75 x 12,5 mm. Bone augmentation was performed due to insufficient alveolar ridge at the area of 11, 21, 23.

A mix of xenograft and autograft, provided by a collagen resorbable membrane, was used for grafting (BioOss xenograft and BioGide Membbrane, Geistchlich, Switzerland) (Picture 12). Suturing was performed. (Picture 13, 14).

Postoperative antibiotic (tbl. Amoxiclav a 1000mg 2x1), antiedematous (Drag. Chymoral forte), and painkiller therapy, were prescribed for 7 days postoperative. Advices were given to maintain oral hygiene and rinsing with chlorhexidine solution (Perio Plus). Postoperative checkup was performed 1 day after the surgery. Sutures were removed 7 days after the surgery.

## *Results and Conclusions*

The majority of dental trauma is initially seen within a primary rather than secondary care setting. General dental practitioners should therefore be able to effectively manage the most common dental injuries, and to refer the complicated ones to oral surgeon. Affected traumatized teeth often have a reduced prognosis and, in some instances, may require extraction. Dental implants are reliable to replace teeth lost because of traumatic dental injury.

Immediate implantation is the best treatment protocol If possible, because it preserves the remaining bone, and shortens the period for prosthetic rehabilitation. None of the implants showed biological complications. Osseointegration was successful especially with implants that were immediately placed.

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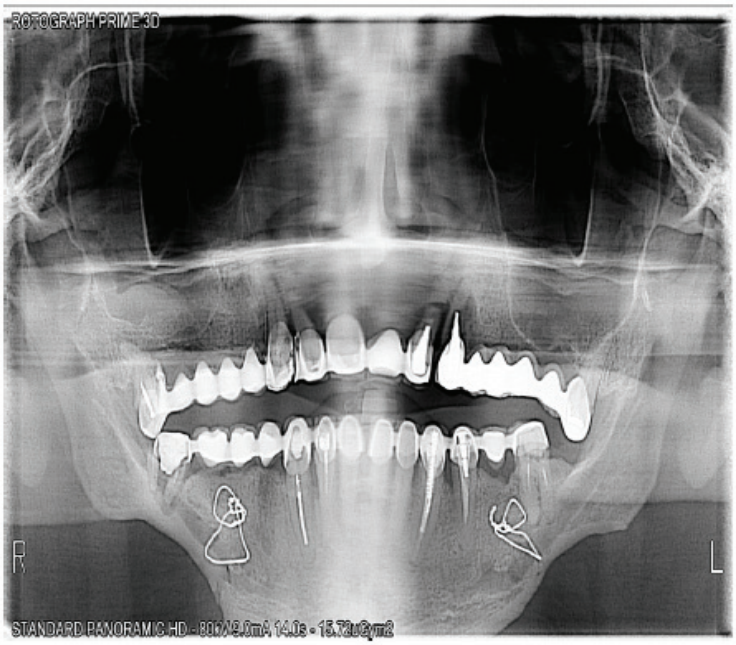
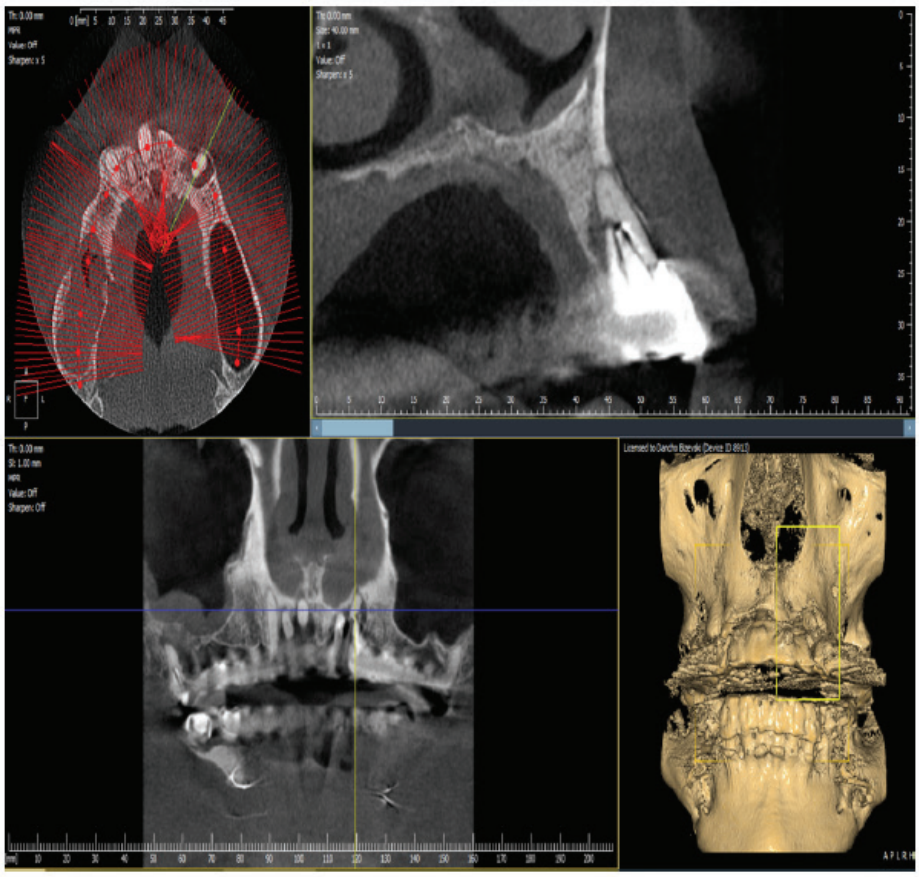
## *Pictures*

*Picture 1 - Preoperative assessment – frontal view*

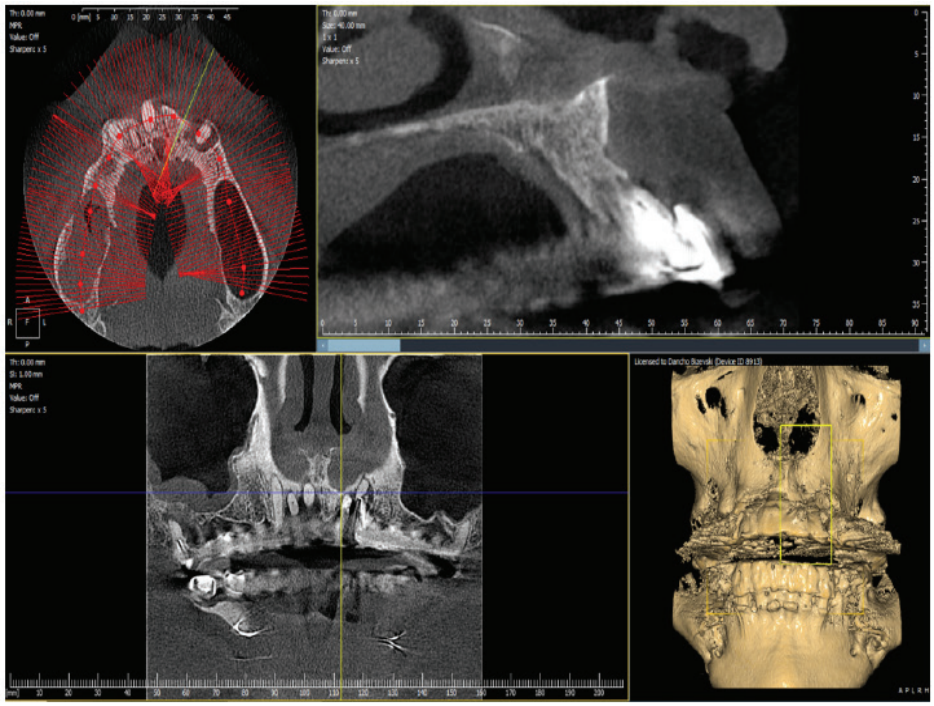
*Picture 2 - Preoperative assessment – occlusal view*



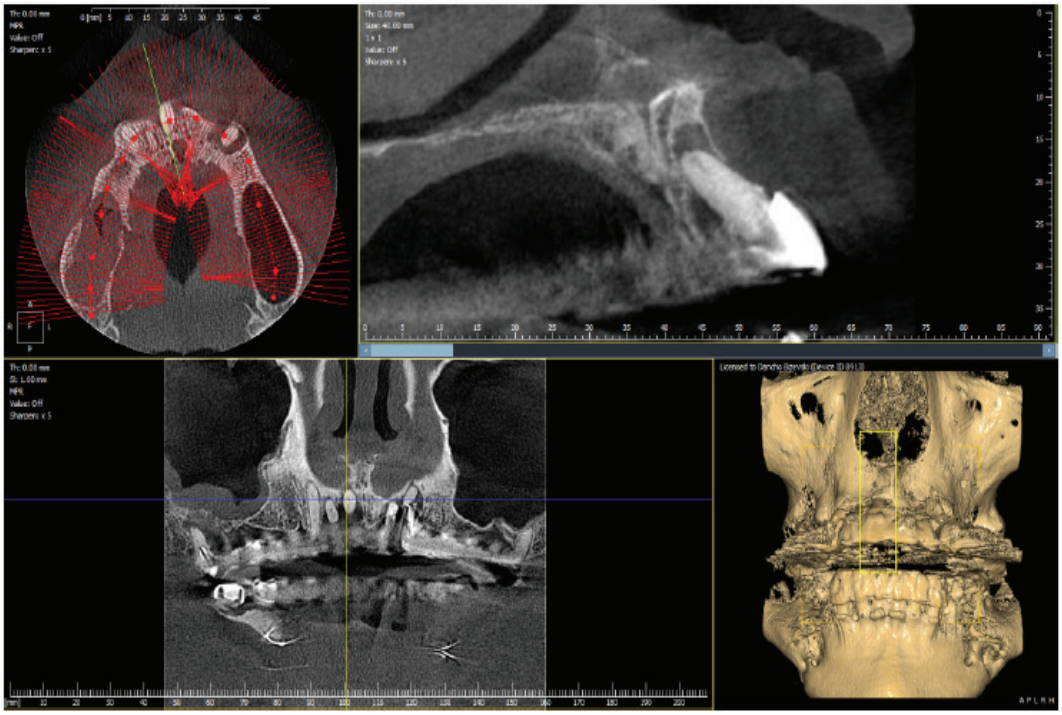

*Picture 3 - Preoperative panoramic*



*Picture 4 - Preoperative 3D CBCT, area 23*

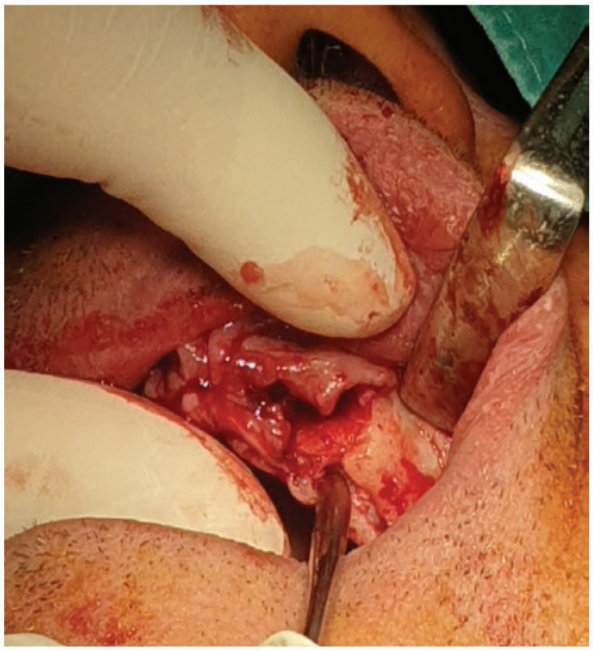


*Picture 5 - Preoperative 3D CBCT, area 21*

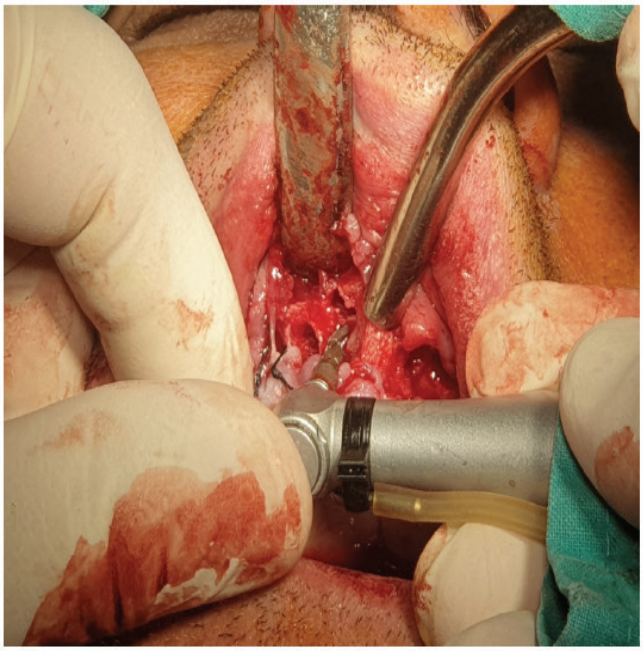


*Picture 6 - Preoperative 3D CBCT, area 11*

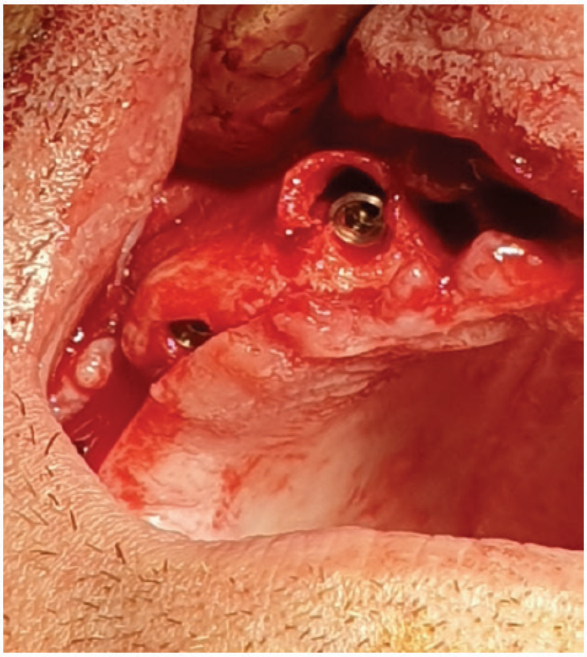
*Picture 7 - Extracted teeth*



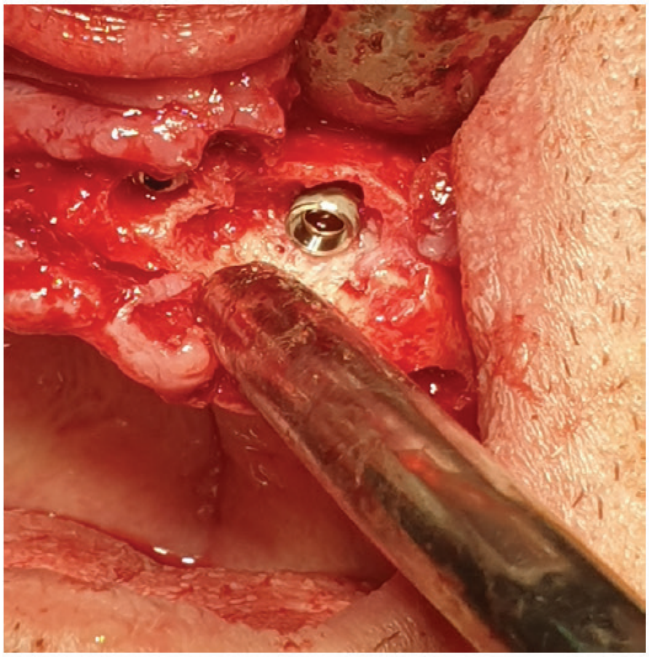
*Picture 8 - Mucoperiosteal flap elevation*



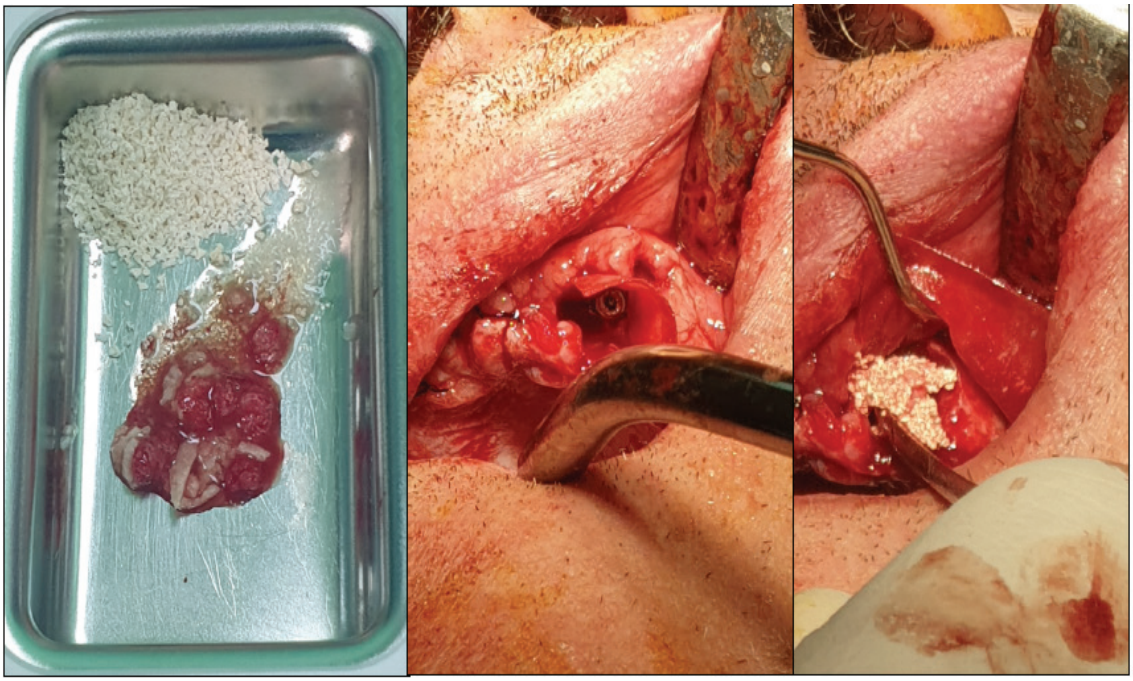
*Picture 9 - Immediate implantation region 11*



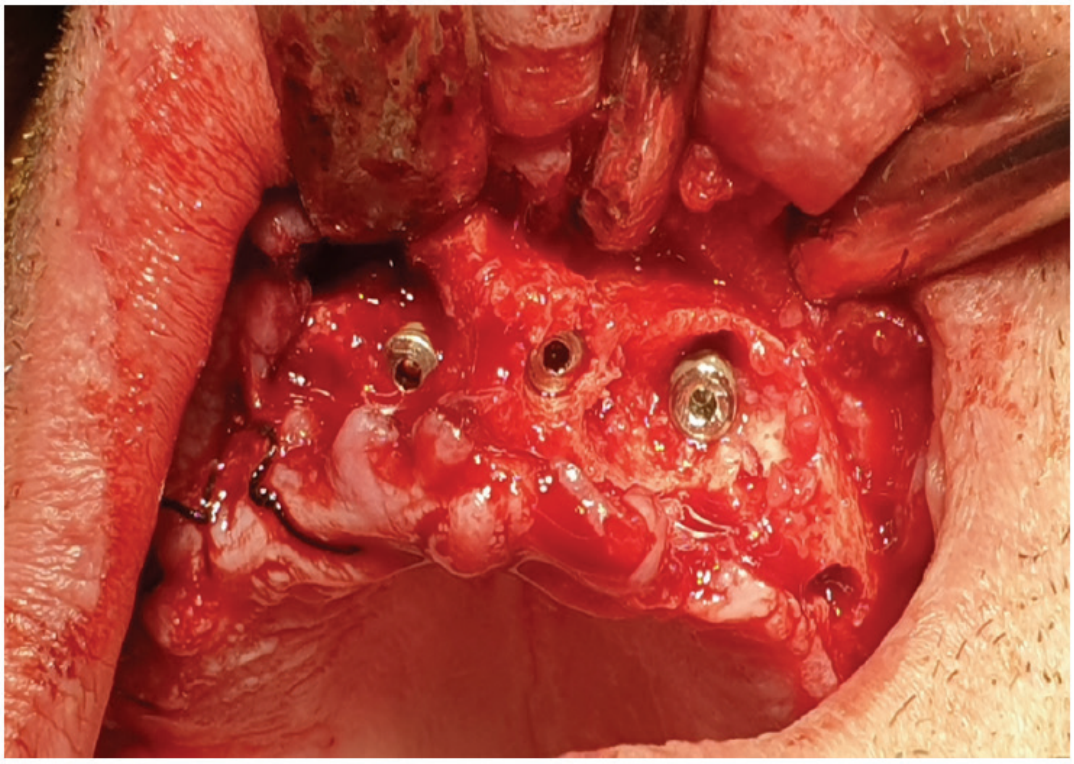
*Picture 10 - Immediate implant - position 13*



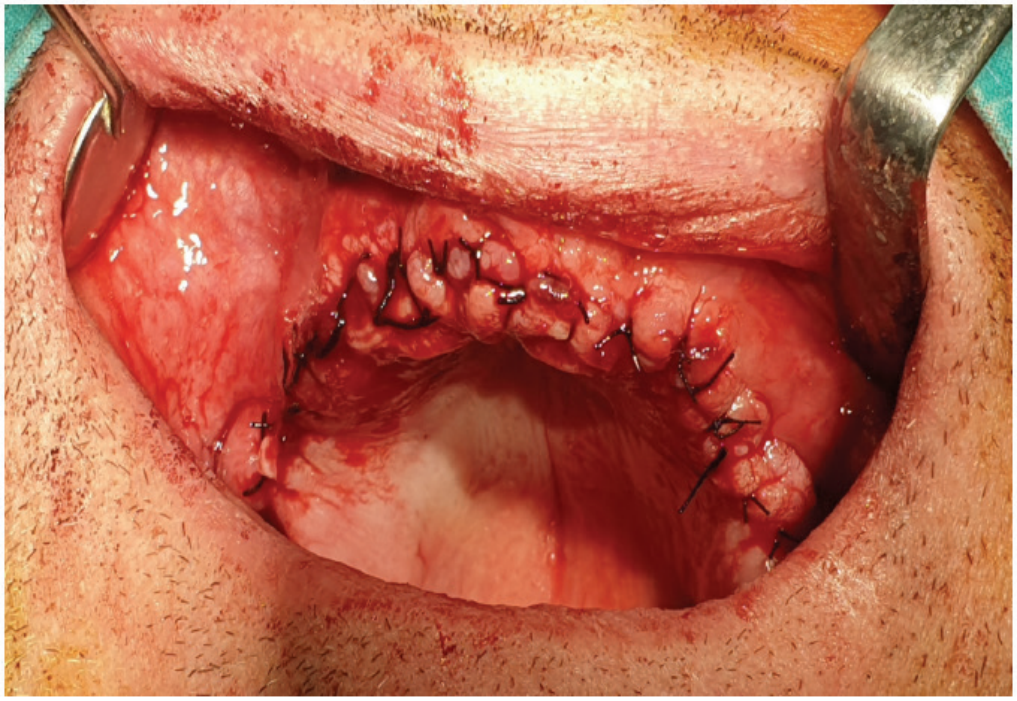
*Picture 11 - Immediate implants - position 21 and 23*



*Picture 12 - Bone augmentation*



*Picture 13 - Implants placed in the frontal maxilla*



*Picture 14 – After Suturing*