

Atraumatic Extraction & Immediate Implant Placement: “A Full Arch Rehabilitation”- A Case Report

¹Dr Shilpa Jaryal, MDS Student, Department of Periodontology and Oral Implantology, National Dental College and Hospital, Derabassi, Mohali, Punjab.

²Dr Gurpreet Kaur, HoD Department of Periodontology and Oral Implantology, National Dental College and Hospital, Derabassi, Mohali, Punjab.

³Dr Deepak Grover, Reader, Department of Periodontology and Oral Implantology National Dental College and Hospital, Derabassi, Mohali, Punjab

⁴Dr Satpreet Singh, Professor, Department of Prosthodontics Crown Bridges And Oral Implantology, National Dental College And Hospital, Derabassi, Mohali, Punjab

Corresponding Author: Dr Shilpa Jaryal, MDS Student, Department Of Periodontology and Oral Implantology, National Dental College and Hospital, Derabassi, Mohali, Punjab.

Citation of this Article: Dr Shilpa Jaryal, Dr Gurpreet Kaur, Dr Deepak Grover, Dr Satpreet Singh, “Atraumatic Extraction & Immediate Implant Placement: “A Full Arch Rehabilitation”- A Case Report”, IJDSIR- November - 2020, Vol. – 3, Issue - 6, P. No. 25 – 32.

Copyright: © 2020, Dr Shilpa Jaryal, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Modern dentistry has changed tremendously with implant therapy. For the successful implant therapy, making a proper treatment plan considering both surgical and prosthetic part in mind is the key of success. There is an accelerated resorption in the first six months after the extraction of the dental element, both horizontally and vertically. It is concluded that when carefully indicated and planned, this technique can provide an immediate result, maintaining the tooth gingival contour, reducing the treatment time and the number of surgical interventions. The present case has discussed step-by-step detailed surgical and prosthetic part to help all dental

implant practitioners in making of an optimal treatment plan.

Keywords: Atraumatic Extraction, Immediate Implant , Osseointegration, Prosthesis.

Introduction

Edentulism is prevalent worldwide among elderly people, and it is mainly attributed to dental caries and periodontal diseases. However, there is an association between socio demographic factors, age, gender, low family-income, lifestyle, and tooth loss. In addition, earlier studies have shown edentulism to be a global issue, and it seems to be associated with systemic disorders [1]. The use of dental implants to treat partially edentulous and fully edentulous

patients is both a viable and mainstream procedure in modern-day dentistry. Implants placed in the mandible have been reported as having more favorable success rates than that of the maxilla [2,3]. This has been related to a comparative lower bone density of the maxilla than the mandible. Within the mandible it has been shown that success rates for the posterior region are significantly less than anterior areas [3].

This has been attributed to a decreased bone height and density from anterior to posterior. Recommendations have been made that implant length should be of at least 8 mm and placed within sound bone [4,5,6] and not within 2 mm of a vital nerve structure [7]. In the posterior mandible, the inferior alveolar canal encasing the inferior alveolar nerve (IAN) must be considered.

In atrophic mandibles, implant placement may be contraindicated due to proximity gap of the IAN, or transposition techniques may be considered. Computed tomography (CT scan) is valuable in the comprehensive assessment of implant sites in particular in the atrophic posterior mandible. [8] Implant-borne rehabilitation is a good option of treatment for patients with partial edentulism [9]. The validity of Osseo integrated dental implants for the rehabilitation of partially edentulous jaw had been related in the literature by several studies [10]. These rehabilitations offer substantial benefits when compared with removable partial dentures like improved occlusion and support, simplification of the prosthesis, less invasive restorative procedures, bone maintenance and, improvement in oral health [11]. However, to obtain excellent results in rehabilitation with dental implants meticulous attention must be paid to the details [12]. In addition, the posterior quadrants of the mouth are challenging for rehabilitation with dental implants [13] due to their anatomical and occlusal features [14]. Various factors need to be evaluated during preoperative

planning,[15] and the timing of implant placement post-extraction is considered an important factor which influences the esthetic outcome.

Traditionally, compromised teeth were removed and the resultant extraction sockets were left to heal for four to six months before dental implants were placed.[16] However, marked alterations occur in the edentulous site following extraction, not only in the buccal–lingual/palatal dimension (about 50 percent), but the height of the buccal bone crest also decreases.[17, 18]Improved implant hardware coupled with patient demand has shifted research focus towards shortened post-extraction healing time or immediate implant placement following extraction. Thus, this article aimed to discuss the atraumatic extraction and placement of the dental implants in remaining edentulous ridges and full arch rehabilitation.

Case Presentation

Examination and Diagnosis

A 52 years old married female patient reported to the Department of Periodontology and Oral Implantology, National Dental College & Hospital, Derabassi with a request for a solution to her oral condition. She was unpleasant with her oral health, halitosis, difficulty to chew, and unaesthetic smile, she was very apprehensive of dental treatment and refused to wear any removable device or complete denture, the patient was unhappy about her appearance, was withdrawn, and showed signs of depression. Proper case history was recorded for the patient. The extra- and intra oral examination did not establish any significant findings. She had no systemic status history.

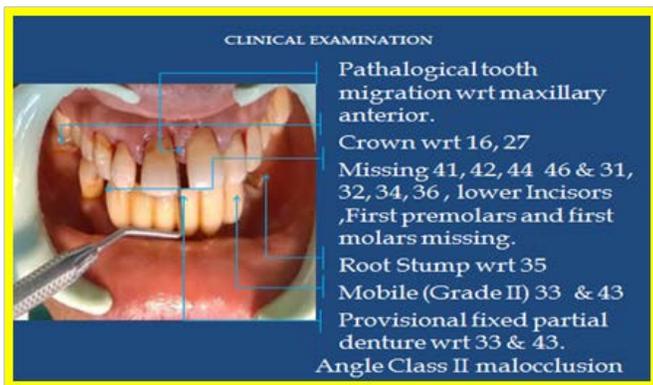


Figure 1

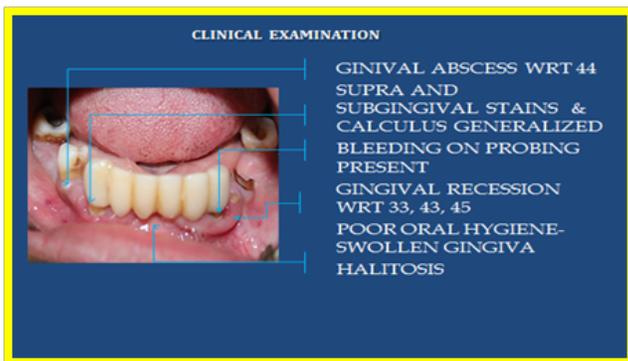


Figure 2

Clinical examination revealed natural teeth in the upper jaw (Maxilla) and partial edentulism and a failing dentition, all remaining teeth and root stump were compromised, and temporary prosthesis in anterior region on was found in lower jaw. Diagnostic impressions and casts were prepared. Thorough examination was done and patient was motivated for oral hygiene and implant prosthesis. In order to plan an implant-supported oral rehabilitation, a preliminary cone beam computed tomography (CBCT) was advised to better evaluate the bone status of both jaws. CBCT bone mapping was done to evaluate the width of bone, length of available bone was calculated and appropriate sized implants were selected.

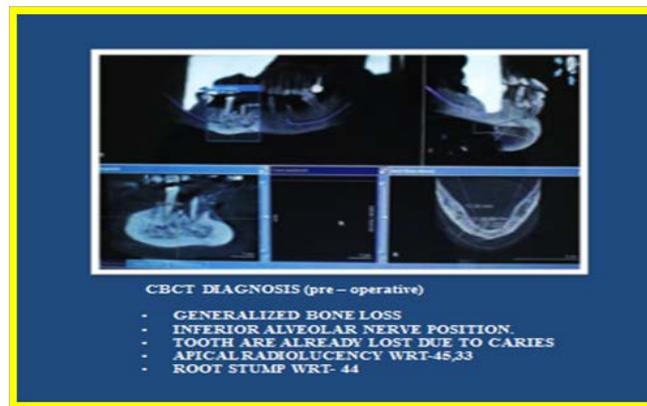


Figure -3 CBCT Diagnosis

Treatment Plan

It was decided that the patient would benefit from an immediate implant placement. The remaining teeth appeared not to be suitable for supporting a fixed rehabilitation, both for their position and for the periodontal attachment loss, and were considered hopeless. The treatment plan consisted of fixed full-arch rehabilitation (except 37 and 47) of mandibular arch supported by 6 implants after the extraction of remaining teeth (four dental implants in the anterior region and two dental implants in the posterior region). The patient was informed about the treatment and a written consent was taken.

Surgical Phase

Following steps were followed in this stage:

- 1- Atraumatic extraction of residual teeth.
- 2- Incision is made at edentulous site.
- 3- Implant placement
- 4- Cover screw placement
- 5- Suturing
- 6- Healing phase
- 7- Second surgery phase
- 8- Abutment attachment.

The following pre- medication was prescribed:

- Anti-inflammatory drugs and antibiotic prophylactic protocol (amoxicillin 2g) 1 hour before surgery.

- Chlorhexidine mouth rinse 0.20% for 1 minute before surgery.

Local Anesthesia

Local anesthesia was administered and mandibular block using lidocaine 2% with 1 in 80.000 epinephrine.

Extractions Atraumatic extractions to preserve bone, gingival architecture, and allow the option of immediate implant placement were performed and socket were thoroughly debrided.



Figure 4, 5 : Before Extraction , Teeth after Atraumatic Extraction

Incision/ Implant Osteotomy

A crestal incision in the keratinized gingival layer extended by two small releasing incisions in the posterior areas enables us to carefully uncover the mental foramen, which is the major anatomical bodies in this zone. Crestal bone osteoplasty and flattening procedures were carried was out in edentulous knife-edge ridge to restore bone width before implant placement. Two implants were inserted in site 32 and 42 and four implants in posterior region (34-36 and 44-46). In 32 and 42 region, 3.75× 10.5mm implant was placed. In 34 region 3.75 ×10mm implant is placed. In 44 regions 4.2× 10mm implant was placed and in 36 and 46 regions 4.2×8mm implant was placed. Paralleling tools were placed and checked for angulations of the implant. Sequential drills were used and implants were placed in the osteotomy site and wrenched into the site until all threads were buried. After that cover screws were placed and suturing was done.

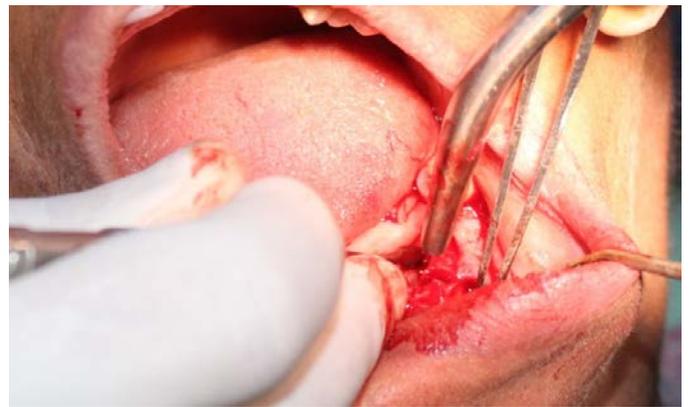


Figure 6: Incision and Flap Reflection



Figure 7: Initial drill in position



Figure 8: Before placing the cover screws



Figure 9: Figure 5: Suture (After surgery had been performed, the sutures were left for 2 week)



Figure 10: Pre-operative and post-operative radiographs

Patient was advised to follow liquid diet for 1 week, and then change to soft diet for 6 more weeks. Amoxicillin (500 mg q.i.d.) was prescribed for 7 days. Hydrocodone with acetaminophen was given in case of pain. Patient was advised to use 2% Chlorhexidine gluconate mouthwash twice daily and gel daily. Panoramic X-Ray was reviewed, follow up after 1 week, after 1 month, after 3 months.

Prosthetic Phase

After 3 months, patient was recalled and postoperative OPG was viewed for proper osseointegration. After confirming osseointegration, flap was elevated and cover screws were removed and per mucosal extension was placed and we waited for a week for healing to take place. After 4 months, a gingival former was placed over the implant. Following healing, per mucosal extensions were removed and impression analogues were placed. The healing abutment/cap was replaced with closed tray transfer coping. Close tray impression was made with elastomeric impression material.

The closed tray transfer coping (impression coping) was selected according to the shape and size of the fixture head and its fitting was re-confirmed by radiograph. The implant analog was tightened with the closed tray impression coping and was being repositioned into the

impression. Impression coping was recorded accurately for the fate of implant supported prosthesis. Abutment was placed on the cast and mounting was done. Metal trial was carried out, later ceramic build up was done and final prosthesis was fabricated and checked in oral cavity and final cementation was done. Postoperative oral hygiene instructions were given to the patient and proper follow-up was done.

Second Stage Surgery



Figure 11: Healing abutment placement



Figure 12: Healing abutment after 1 week.



Figure 13: Impression coping to the implant



Figure 14: Impression making- For impression (Rubber base impression material)



Figure 15: Metal trial was carried out



Figure 16: Ceramic build up was done



Figure 17: Final prosthesis in position

Discussion

Many clinical reports and experimental studies in the animal model demonstrated the favorable outcome of dental implants immediately inserted in freshly extraction socket, without the use of any regenerative materials [19,20,21,22]] .

Our data show a survival rate of immediately implantation carried out on this patient at one year after immediate implantation and does not differ from the cases in which implant was placed in healed sites.

These data agree with those from other authors who evaluated the clinical success rate of immediate implantation without use of any membrane or graft material in both humans and animals.[23]Correct diagnosis and accurate implant planning are key for success in implant rehabilitation. The use of advanced planning, for example, computer-based planning using CT scans, allows the surgeon to reduce the risk of damaging nearby structures and allows for more precise planning than use of conventional printed CT scans.[24] Periodic clinical assessment of the implant fixture, prosthesis, and surrounding tissue is critical for clinical success. In the present case, patient was called for every 3, 6, and 12 months, professional removal of supragingival and subgingival deposits on a regular basis was done.

Conclusion

Availability of a fixed treatment option is a remarkable advancement in prosthodontics. It is one of the dentistry's most gratifying treatment modalities, but it demands considerable skill and judgement and a high degree of patient commitment and understanding. In present case report, the patient was fully satisfied with the treatment outcome compared to his previous conventional denture.

References

1. Tatum H Jr. Maxillary and sinus implant reconstructions. *Dent Clin North Am.* 1986;30(2):207-229.
2. Friberg B, Jemt T, Lekholm U (1991) Early failures in 4,641 consecutively placed Brånemark dental implants: a study from stage 1 surgery to the connection of completed prostheses. *Int J Oral Maxillofac Implants* 6: 142-146.
3. Becker W, Becker BE, Alsuwyed A, Al-Mubarak S (1999) Long-term evaluation of 282 implants in maxillary and mandibular molar positions: a prospective study. *J Periodontol* 70: 896-901.
4. Friberg B, Jemt T, Lekholm U (1991) Early failures in 4,641 consecutively placed Brånemark dental implants: a study from stage 1 surgery to the connection of completed prostheses. *Int J Oral Maxillofac Implants* 6: 142-146.
5. Lekholm U (1992) The Branemark implant technique: a standard procedure under continuous development. *Tissue Integration in Oral, Orthopaedic and Maxillofacial Reconstruction.* Chicago.
6. van Steenberghe D, Lekholm U, Bolender C, Folmer T, Henry P, et al. (1990) Applicability of osseointegrated oral implants in the rehabilitation of partial edentulism: a prospective multicenter study on 558 fixtures. *Int J Oral Maxillofac Implants* 5: 272-281.
7. Nevins M, Mellonig JT (1998) *Implant Therapy: Clinical Approaches and Evidence of Success.* New York.
8. Wyatt CC, Pharoah MJ (1998) Imaging techniques and image interpretation for dental implant treatment. *Int J Prosthodont* 11: 442-452.
9. Ozkan Y, Akoğlu B, Kulak-Ozkan Y. Five-year treatment outcomes with four types of implants in the posterior maxilla and mandible in partially edentulous patients: a retrospective study. *Int J Oral Maxillofac Implants.* 2011; 26:639–647.
10. Jemt T, Lekholm U. Oral implant treatment in posterior partially edentulous jaws: a 5-year follow-up report. *Int J Oral Maxillofac Implants.* 1993; 8:635–640.
11. Jivraj S, Corrado P, Chee W. An interdisciplinary approach to treatment planning in implant dentistry. *Br Dent J.* 2007; 202:11–17.
12. Chrcanovic BR, Albrektsson T, Wennerberg A. Reasons for failures of oral implants. *J Oral Rehabil.* 2014; 41:443–476
13. Chang SH, Lin CL, Hsue SS, Lin YS, Huang SR. Biom-echanical analysis of the effects of implant diameter and bone quality in short implants placed in the atrophic posterior maxilla. *Med Eng Phys.* 2012; 34:153–160.
14. Buser, D., Martin, W. & Belser, U.C. (2004) Optimizing esthetics for implant restorations in the anterior maxilla: anatomic and surgical considerations. *The International Journal of Oral & Maxillofacial Implants* 19(Suppl): 43–61.
15. Quirynen M, Assche N, Botticelli D, Berglundh T. How does the timing of implant placement to extraction affect outcome? *Int H Oral Maxillofac Implants* 2007;22(suppl): 203-223
16. Schropp, L., Wenzel, A., Kostopoulos, L. & Karring, T. (2003) Bone healing and soft tissue contour changes following single-tooth extraction: a clinical and radiographic 12-month prospective study. *The International Journal Periodontics Restorative Dentistry* 23: 313–23.
17. Botticelli D, Persson LG, Lindhe J, Berglundh T. Bone tissue formation adjacent to implants placed in fresh extraction sockets: an experimental study in

- dogs. Clin Oral Implants Res. 2006 Aug;17(4):351-358.
18. Adell R, Errikson B, Lekholm U, Branemark PI, Jemt T. Long-term follow-up study of osseointegrated implants in the treatment of totally edentulous jaws. Int J Oral Maxillofac Implants 1990; 5:347-59.
19. Bajali M., Abdulgani Azz., Abu-Hussein M.; EXTRACTION AND IMMEDIATE IMPLANT PLACEMENT, AND PROVISIONALIZATION WITH TWO YEARS FOLLOW-UP: A CASE REPORT, Int J Dent Health Sci 2014; 1(2): 229-236 .
20. Branemark et al. Osseointegrated implants in the treatment of the edentulous jaw. Experience from a 10-year period. Stockholm: Almqvist & Wiksell Int, 1977.
21. Abu-Hussein M., Abdulghani A., Sarafianou A., Kontoes N.; Implants into fresh extraction site: A literature review, case immediate placement report, Journal of Dental Implants . 2013 , 3; 2,160-164.
22. Gomez-Roman G, Schulte W, d'Hoedt B, Axman-Krcmar D. The Frialit-2 implant system: five-year clinical experience in single-tooth and immediately postextraction applications. The International Journal of Oral and Maxillofacial Implants 1997;12(3):299–309.
23. Michele Paolantonio, Marco Dolci, Domenico D'Archivio, et al. Immediate implantation into fresh extraction sockets. A controlled clinical trial and histological study in man. J of Periodontol 2001; 72:1560-1571.
24. Abrahams JJ. The role of diagnostic imaging in dental implantology. Radiol Clin North Am. 1993;31: 163–180.