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IMPLANT SURGICAL TREATMENTS IN COMPROMISED PATIENTS

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Abstract

Implant surgical treatments represent one of the most advanced and effective solutions for restoring oral function and aesthetics. However, the application of implant surgical treatments in compromised patients presents special clinical challenges due to systemic conditions that may affect the osseointegration process and oral soft tissue healing. Factors such as diabetes, osteoporosis, smoking, cardiovascular disease or immunosuppressive drug therapy may limit the success of the treatment in the absence of careful planning and personalized surgical protocol. The modern approach to implantology emphasizes the importance of multidisciplinary patient assessment, careful selection of biomimetic materials and the application of atraumatic techniques that minimize the risk of complications. This paper presents a clinical case of implant surgical treatment in a compromised patient, emphasizing the importance of careful management before, during and after the intervention to achieve long-term results.

Keywords: Dental implants, compromised patients, surgical treatment, osseointegration, implant success, oral rehabilitation.

Introduction

A considerable proportion of the world's population belongs to the elderly age group, and consequently, this condition is accompanied by a variety of systemic pathologies manifested by these individuals. The management of medically compromised patients can represent a distinct challenge within the framework of oral complications, therapeutic interventions, and dental emergencies [1–2].

The oral cavity serves as an excellent barometer for assessing a patient's general health status. In order to achieve an accurate diagnosis and appropriate surgical treatment of pathologies in the oro- maxillofacial region, a thorough subjective and objective examination, along with high-quality complementary investigations, is essential [3].

Before any surgical intervention, an assessment of the patient's general and local condition, anxiety levels, radiographic evaluation, and the necessary surgical instrumentation is required. Once the patient has been properly evaluated and informed in detail, an informed consent form must be signed, ensuring that the patient has fully understood the surgical treatment plan as well as the potential intraoperative and postoperative complications [3–4].

Despite the high success rate of dental implants in healthy patients, the surgical management of medically compromised individuals remains a clinically significant challenge. Conditions such as

diabetes mellitus, osteoporosis, cardiovascular diseases, immunodeficiencies, and long-term use of cor-

ticosteroids or bisphosphonates may negatively affect the process of osseointegration, soft tissue healing, and the long-term stability of dental implants.

In 1962, the American Society of Anesthesiologists (ASA) established a classification system to assess the severity of systemic diseases, which has since been universally accepted. This classification was designed to evaluate the medical risk of patients undergoing general anesthesia and various surgical procedures [5]. The following table presents this classification:

ASA	Description
ASA I	Normal, healthy patients without any systemic disease.
ASA II	Patients with mild to moderate systemic disease.
ASA III	Patients with severe systemic disease that limits daily activity but is not incapacitating.
ASA IV	Patients with severe systemic disease that is incapacitating and poses a constant threat to life.
ASA V	Moribund patients who are not expected to survive more than 24 hours without surgical intervention.

Table 1.1. Classification According to ASA

Aim and purpose

The aim of this study is to present and evaluate the surgical implant management of medically compromised patients, emphasizing the importance of multidisciplinary planning, the selection of appropriate materials, and the adaptation of surgical techniques according to the patient's general health condition.

Methodology

With the aid of pre- and post-operative radiographs, as well as clinical surgical and implant photographs, two clinical cases were documented and reported, treated in a private dental clinic in May 2025 and October 2025. The patients' individual data were obtained from their clinical records, as follows:

- General information: name, surname, gender, age;
- Reported systemic pathologies;
- Medications used by the patient;
- Preoperative management;
- Diagnosis and treatment plan.

The following procedures were carried out for data collection:

1. Authorization was obtained from the attending dentist of the clinic for the use of the patient's clinical and radiographic data, in full compliance with principles of confidentiality and medical professional ethics.
2. The patient included in the study was systemically compromised and was selected based on clinical and radiographic criteria that allowed for the safe and effective placement of a dental implant.
3. The implants were placed under aseptic conditions following standard surgical protocols. Postoperative follow-up was conducted at regular intervals to assess the process of osseointegration and soft tissue healing.

Clinical case 1

A 53-year-old female patient presented to the clinic with extensive composite restorations and secondary caries. During the medical history, the patient reported episodes of seizures due to epilepsy but was under the care of a neurologist. The management protocol followed for this patient focused on anxiety reduction: the night before the procedure, she received 10 mg of Valium, and on the day of the intervention, 100 mg of Secobarbital. The procedure was scheduled early in the morning, and a low-dose local anesthetic with adrenaline was used.

The patient's chief complaint was pain from tooth 26, which had undergone endodontic treatment seven months earlier at another clinic. Radiographic examination revealed a failed endodontic treatment and significant crown destruction of the tooth.

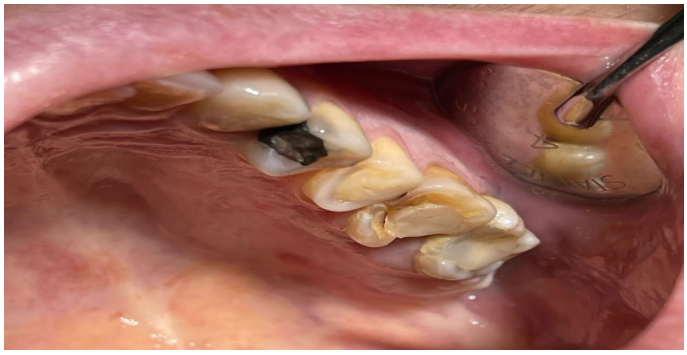

Fig. 1. Intraoral Photograph

After measurements were taken on the panoramic radiograph, the destroyed crown of the tooth was removed down to the gingival level to maximize the available field of view.

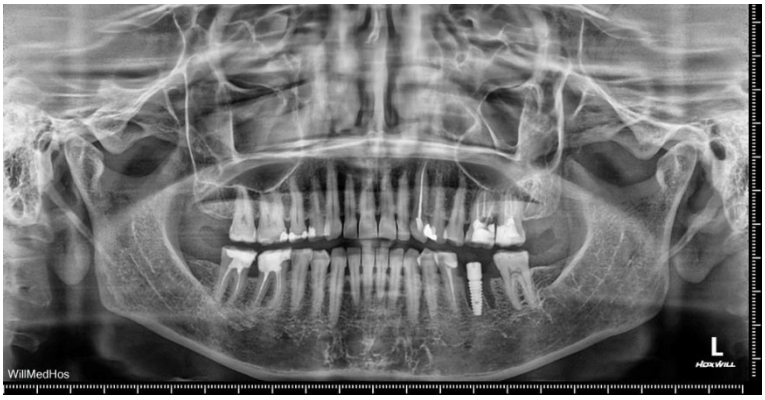

Fig. 2. Panoramic Radiograph

Using implant drills up to the penultimate drill of the final implant diameter (Swiss implant 18 mm × 3.75 mm), an initial entry foramen was created at the level of the bifurcation to serve as a natural guide during implant placement.

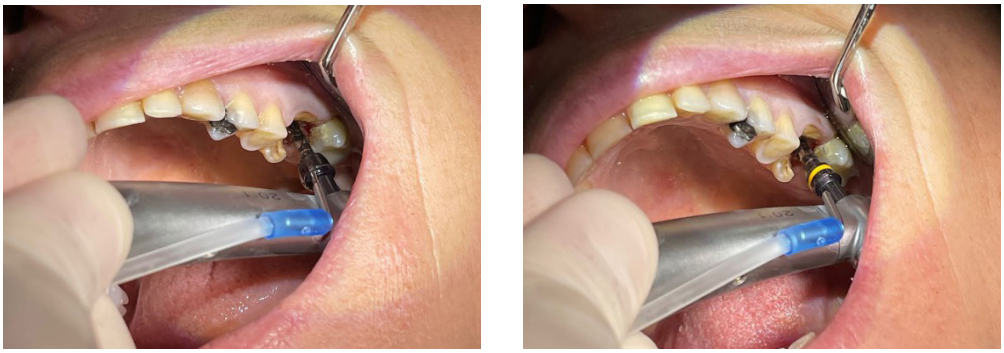

Fig. 3. A, B The creation of a Foramen at the Bifurcation Level as a Guide for the Upcoming Implant

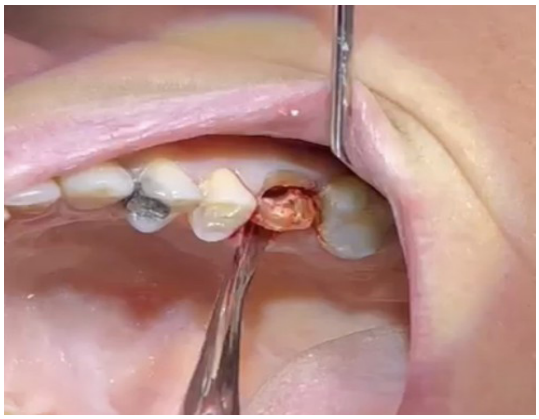
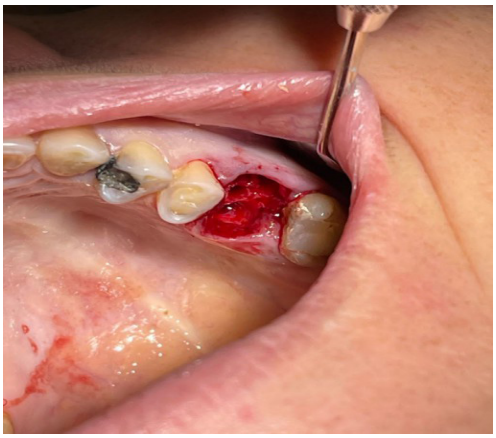

Fig. 4. A, B. Atraumatic Removal of Remaining Tooth and Root Fragments

Subsequently, the final implant bed was prepared for the placement of the implant.

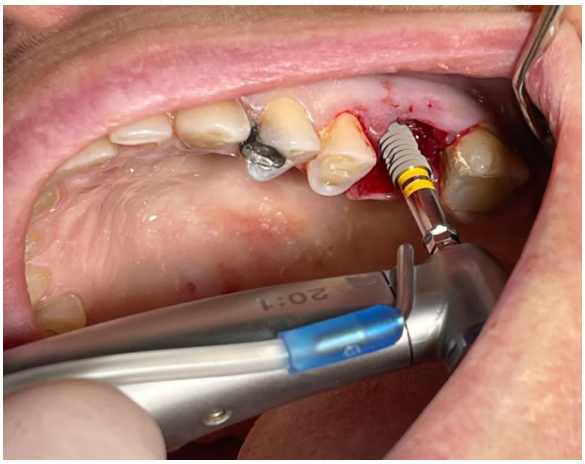
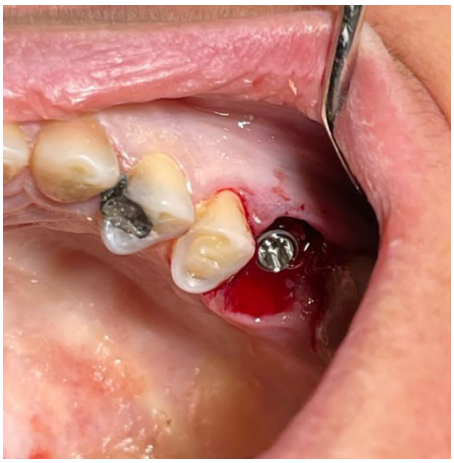

Fig. 5.A, B. The final Implant Bed

A 17-degree abutment was placed on the implant, and interrupted suturing of the healing caps was performed using synthetic resorbable Polyglecaprone sutures (USP 4-0).

Fig. 6. Abutment Placement and Suturing

Postoperative recommendations and prescriptions included ketoprofen 25 mg every 8 hours for 3 days as an analgesic and anti-inflammatory, and amoxicillin with clavulanic acid every 12 hours for 7 days. A soft diet was advised for 3 weeks, along with regular follow-up visits.

The patient was referred for a panoramic radiograph two weeks later to assess the condition of the implant. The patient is still under treatment for the placement of a fixed prosthetic restoration on the implant.

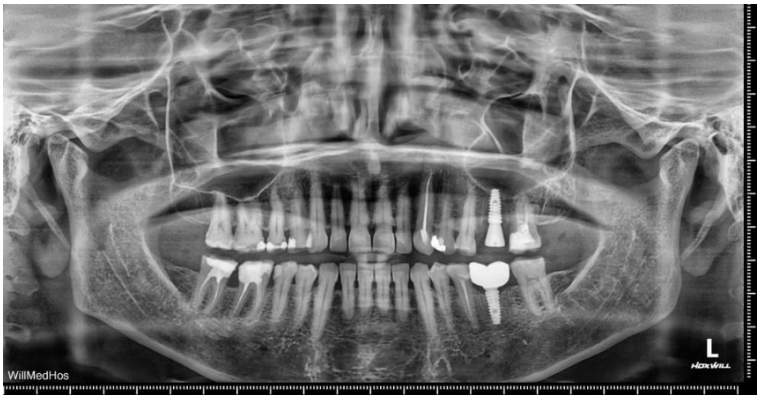

Fig. 7. Postoperative Control Radiograph, 2 Weeks Later

Clinical Case II

A 65-year-old female patient presented to the clinic complaining of an unsatisfactory aesthetic appearance. The patient was a smoker with good oral hygiene but had generalized chronic periodontitis. Medical history revealed that she had type 2 diabetes mellitus, controlled with metformin 500 mg twice daily. Due to Grade 3 mobility of the teeth, it was decided to extract teeth 16 through 26.

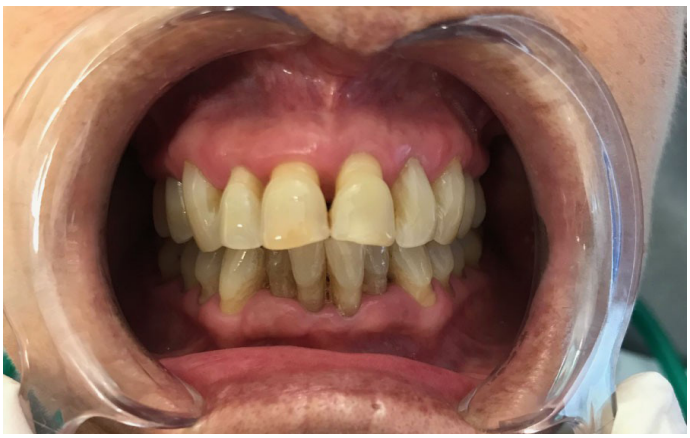

Fig.8. Preoperative clinical photo

Before the surgical intervention, the patient underwent a comprehensive preoperative laboratory and imaging assessment. Metabolic parameters for diabetes, including blood glucose and HbA1c at 6.8%, were stable and suitable for implant rehabilitation. Additionally, INR, prothrombin time, and coagulation time were within normal limits. A fixed rehabilitation using four maxillary implants with the all-on-four technique was proposed. Under consultation with her physician, the patient was advised to discontinue metformin 48 hours prior to the surgical procedure.

Under local anesthesia with 4% Articaine and 1:100,000 epinephrine, a full-thickness mucoperiosteal flap was created only on the vestibular side to preserve the shape of the gingival papillae. Four implants were placed in positions 15, 13, 23, and 25 with slight apical inclination toward the palatal side. The implant platform was positioned

1.5 mm below the bone crest on the buccal and cervical aspects, with the two anterior implants measuring 16 × 3.5 mm and the posterior implants 18 × 3.5 mm

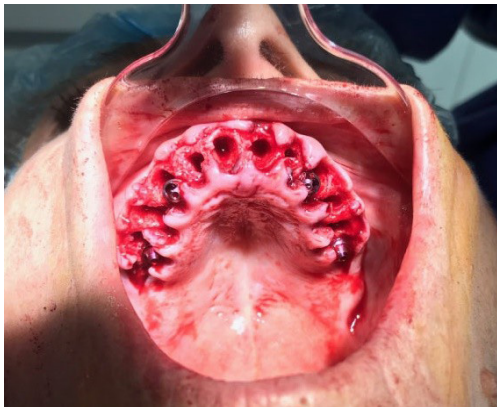

Fig. 9. Implants Placement

Multi-unit abutments (MUA) were placed on each implant, with a 30-degree inclination for the two posterior implants and a 15-degree inclination for the two anterior implants at positions 23 and 13. Interrupted suturing was performed using synthetic resorbable Polyglecaprone sutures (USP 5-0).

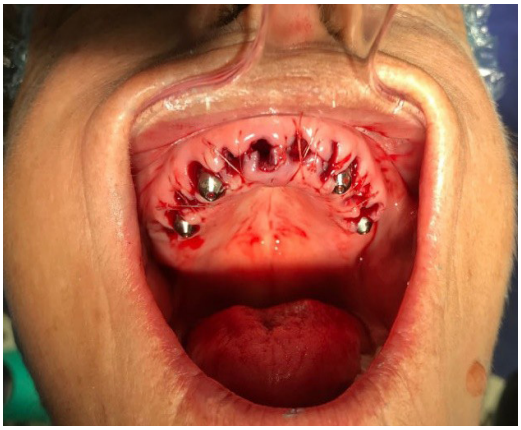

Fig. 10. Placement of MUA Abutments and Suturing

The impression was taken using putty and light-body silicone, and three hours later, an immediate provisional prosthesis with screw retention was placed. This provisional prosthesis was fabricated to preserve the gingival contours, allowing for their modification in the final prosthesis.

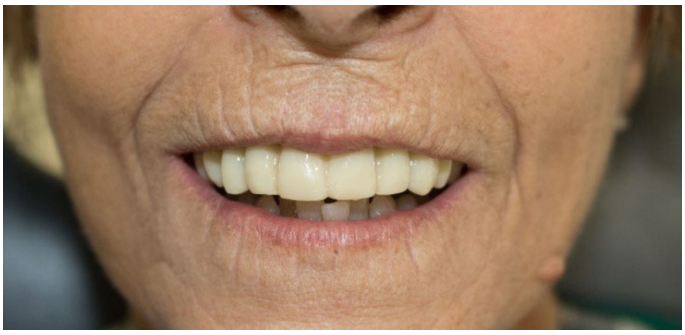

Fig. 11. Provisional Denture

The patient was advised to take Ibuprofen 200 mg as needed, and metformin was to be resumed at the usual prescribed doses 24 hours after the surgery. The patient remains under clinical and radiographic postop-

erative follow-up until the placement of the final prosthesis on the implants.

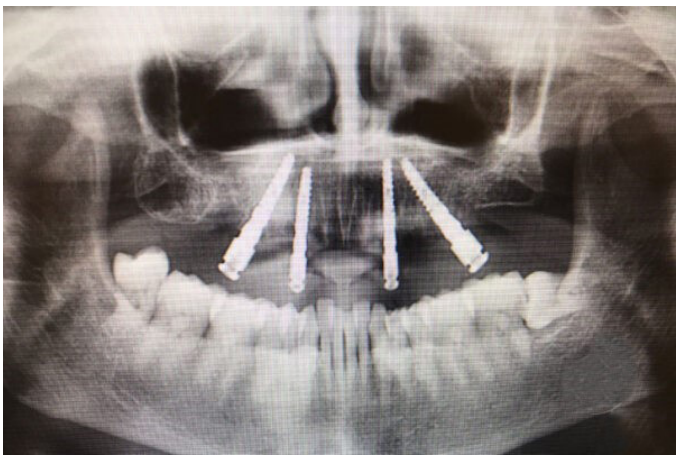

Fig. 12. Radiographic Follow-up, 2 Months Later

Discussion

Surgical implant treatment in medically compromised patients represents a significant clinical challenge, as the long-term success of implants depends on multiple biological, systemic, and technical factors. In this clinical case, careful planning and execution of each therapeutic step played a crucial role in achieving stable outcomes.

According to contemporary literature [6–7], systemic factors such as diabetes mellitus, osteoporosis, epilepsy, or pharmacological treatments affecting bone metabolism (e.g., bisphosphonates) can impair osseointegration by altering local vascularization and osteoblastic activity (Cune et al., 2009[6]; Fisher et al., 2014[7]). However, when systemic parameters are controlled and a minimally invasive surgical protocol is applied, dental implants can achieve success rates comparable to those in healthy patients (Bornstein et al., 2009[8]).

In this case, the implementation of a personalized surgical protocol—including thorough preoperative assessment, careful selection of biocompatible materials, and atraumatic techniques—contributed to improved osseointegration. Furthermore, meticulous postoperative follow-up with regular check-ups and good oral hygiene minimized the risk of complications such as peri-implantitis or marginal bone loss around the implant

These benefits are particularly important in medically compromised patients, where biological healing is often slower. The clinical outcomes achieved in this case support existing literature [6–8], emphasizing the importance of multidisciplinary management. Collaboration between the oral surgeon and the patient's specialist physician is essential for tailoring therapies and controlling systemic risk factors before and after the procedure.

Conclusion

Surgical implant treatments in medically compromised patients can be successfully performed when preceded by a comprehensive clinical and radiographic assessment that allows for the identification and management of risk factors. Regular postoperative follow-up and patient education on oral hygiene are key elements in maintaining long-term implant stability and preventing complications.

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