
Case Report

IRREVERSIBLE COMPLICATIONS FOLLOWING FAILED IMPLANT PLACEMENT IN A 66-YEAR-OLD PATIENT: LOSS OF FIXED PROSTHETIC REHABILITATION AFTER REMOVAL OF PAINFUL MAXILLARY IMPLANTS

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ABSTRACT

This case report describes a 66-year-old woman presenting with persistent pain associated with a provisional fixed prosthesis supported by malpositioned maxillary implants. Clinical and radiographic evaluation revealed pronounced implant angulation errors, inadequate three-dimensional positioning, and loss of prosthetic parallelism, rendering the implants non-restorable. Therefore, complete explantation was indicated and performed without complications. Postoperative radiographs confirmed the absence of implants and the establishment of a stable, healthy anatomical site. However, the extensive hard- and soft-tissue damage resulting from the initial failed intervention significantly compromised the possibility of achieving a predictable fixed implant-supported rehabilitation. Given the patient's age, anatomical limitations, and the biological cost of further regenerative procedures, a removable prosthetic solution was determined to be the safest, most conservative, and most predictable long-term option. This case emphasizes the importance of comprehensive diagnostic assessment, correct imaging selection, and adherence to prosthetically driven planning principles to avoid irreversible biomechanical complications and ensure the long-term success of implant therapy. Moreover, it underscores how early planning errors can trigger a cascade of consequences that progressively reduce rehabilitative options, reinforcing the need for meticulous surgical execution and timely diagnostic interpretation.

KEYWORDS: *implant malposition, prosthetically driven planning, implant failure, orthopantomography, removable prosthetic rehabilitation*

INTRODUCTION

Dental implant therapy is widely recognized as a predictable, long-term solution for replacing missing teeth; however, mechanical, biological, and prosthetic complications may still occur, especially when surgical or prosthetic protocols are not followed properly (1-3). Among the etiological factors contributing to implant failure, peri-implant microbial contamination, inadequate bone quality or quantity, and patient-related systemic conditions have been

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frequently documented (4-7). Insufficient primary stability, often associated with low insertion torque, is an additional risk factor for early implant failure and correlates with higher rates of postoperative complications (8, 9). Epidemiological studies further confirm that smoking, inadequate surgical planning, and operator-dependent variables significantly increase the likelihood of early and late implant loss (10).

Another crucial determinant of implant success is the macroscopic and microscopic characteristics of the implant surface, which influence host-tissue interactions and the progression of osseointegration (11). The biological cascade underlying osseointegration involves a complex interplay of innate immune responses, osteogenic pathways, and controlled inflammatory processes (12). Systemic factors, including vitamin D deficiency, impaired bone metabolism, or chronic comorbidities, may also compromise osseointegration and are associated with higher implant failure rates (13). Foundational research by Brånemark established that direct bone-implant contact is essential for long-term stability (14), a concept clinical investigations further support by demonstrating the importance of atraumatic surgical technique, adequate cooling, and careful handling of soft and hard tissues during implant placement (15).

Historically, the fundamental principles of osseointegration, introduced by Brånemark and later expanded through decades of experimental and clinical research, have formed the basis of contemporary implantology (14, 15). These principles, along with the concept of progressive bone loading, aim to optimize functional stability and reduce mechanical overload during healing (16). Recent evidence also highlights the potential supportive role of photobiomodulation therapy in patients with compromised bone metabolism, such as those undergoing antiresorptive medication, suggesting an adjunctive benefit in enhancing peri-implant tissue responses (17). In addition, innovative laser-assisted decontamination protocols have shown promising clinical and microbiological improvements in managing peri-implant inflammatory conditions, reinforcing the importance of advanced therapeutic strategies when implant health is threatened (18).

From a prosthetic standpoint, complications may arise when implant positioning does not comply with prosthetically driven planning principles. Malpositioned implants frequently lead to biomechanical overload, inadequate emergence profiles, compromised hygiene access, and poor load distribution, all of which may jeopardize both the implant and the prosthetic superstructure (2, 16). In elderly patients, compromised bone conditions, history of multiple treatments, or institutional care settings may further complicate prosthetic planning and limit fixed restorative options (17-19). When implants fail, particularly due to improper three-dimensional placement or inadequate surgical execution, subsequent removal of implants and associated provisional prostheses may cause significant hard- and soft-tissue deficiencies, creating substantial challenges for future rehabilitation.

Given these considerations, proper radiographic evaluation is essential to identify implant malposition, detect peri-implant pathology, and assess the feasibility of a predictable prosthetic plan. Panoramic radiographs remain a common first-level imaging modality, especially for identifying gross anatomical discrepancies before proceeding with more advanced diagnostics.

CASE REPORT

A 66-year-old woman presented to our clinic reporting persistent pain in the right maxillary quadrant associated with a fixed provisional prosthesis supported by previously placed implants. Clinical examination revealed localized discomfort upon palpation of the posterior maxilla and inflammation of the peri-implant soft tissues (Fig. 1, 2).



Fig. 1. *Clinical intraoral photograph at the first examination, showing the soft-tissue condition in the right maxillary posterior region.*



Fig. 2. *Clinical intraoral photograph at the first examination, showing the provisional prosthesis.*

A baseline panoramic radiograph (Fig. 3) showed severely malpositioned maxillary implants in the first quadrant, with improper angulation and loss of parallelism relative to adjacent structures. The implant positions were incompatible with correct prosthetic loading and exhibited a direct correlation with the patient's symptoms. No additional pathologies were observed in the remaining quadrants.



Fig. 3. *Initial panoramic radiograph revealing severely malpositioned maxillary implants in the first quadrant.*

Given the extent of malpositioning and the associated clinical consequences, the treatment plan included complete implant removal. Explantation was performed uneventfully, followed by a healing period and radiographic reassessment. The final panoramic image (Fig. 4) and the clinical signs (Fig. 5) confirmed the absence of implants and an anatomically stable post-extraction environment.



Fig. 4. *Final panoramic radiograph after surgical removal of all malpositioned implants.*



Fig. 5. *Clinical signs after surgical removal of all malpositioned implants.*

DISCUSSION

The present case highlights the multifactorial implications of implant malpositioning and the irreversible anatomical and prosthetic consequences that may arise from inadequately planned implant therapy. Implant dentistry has evolved substantially over the past five decades, and modern protocols emphasize osseointegration, biomechanical balance, and prosthetically driven planning as indispensable prerequisites for long-term success (20). Nevertheless, improper three-dimensional positioning, such as the one observed in the present patient, remains a recurrent clinical challenge with significant functional and rehabilitative repercussions.

From a surgical perspective, incorrect implant placement disrupts the delicate balance required for predictable osseointegration and may predispose the implant to failure even in the absence of overt systemic risk factors (21). As widely acknowledged, implants are not identical to natural teeth, and their ankylotic behavior makes them particularly susceptible to overload when malpositioned.

In this case, the severe angulation discrepancies, loss of parallelism, and spatial disharmony between fixtures in the right maxilla created a biomechanical scenario incompatible with stable loading, leading to persistent pain and prosthetic instability. Improper implant orientation not only complicates prosthetic reconstruction but also increases stress concentration within peri-implant bone, which has been associated with mechanical complications, crestal bone loss, and early failure (22).

Prosthetically driven planning is a fundamental pillar of contemporary implantology. Deviations from this principle invariably lead to complications such as inadequate emergence profiles, non-axial loading, compromised hygiene access, and the need for overcontoured prosthetic structures (2). In the present case, the irreversible structural and prosthetic limitations resulting from the initial failed intervention substantially reduced the feasibility of a future fixed implant-supported restoration. As argued in the literature, extensive hard- and soft-tissue deficiencies may require complex regenerative procedures that are not always predictable, particularly in elderly patients or those with a history of repeated failures (19). For this patient, a removable solution represents the most realistic long-term option, minimizing surgical risk while providing acceptable functional and aesthetic outcomes.

Radiographically, panoramic imaging served as an essential first-level diagnostic tool for identifying the extent of malpositioning and for planning subsequent explantation. Although cone-beam computed tomography (CBCT) offers superior three-dimensional assessment, panoramic radiographs remain useful for detecting macroscopic alignment issues and gross anatomical discrepancies during initial evaluation (23). In the present case, the initial panoramic radiograph clearly revealed the improper placement trajectory, thereby supporting the decision to remove all fixtures and reassess the prosthetic plan.

The complete explantation performed in this case is consistent with current recommendations when implants are non-restorable, symptomatic, or biomechanically incompatible with functional prosthetic loading (24). Several studies confirm that persistence in attempting to restore severely malpositioned implants may ultimately worsen outcomes, exacerbate patient discomfort, and incur additional biological costs (25). Moreover, surgical removal of implants is not without risk, as it can further compromise bone quality and quantity, potentially reducing future rehabilitative options. In this context, avoiding a new fixed implant-supported solution was clinically justified, given the patient's anatomy, history, and prosthetic expectations.

Another important consideration concerns patient-specific risk factors. Although the present patient did not exhibit major systemic contraindications, the literature indicates that factors such as bone density, bone metabolism disorders, or chronic systemic diseases may influence both implant placement and healing potential (24,26). Bruxism, in particular, is associated with mechanical overload and higher failure rates, especially when implants are incorrectly angulated or lack axial support (27). Although not documented in this case, these factors remain relevant when evaluating the feasibility of reimplantation.

Beyond these considerations, another crucial dimension to evaluate is the patient's psychological and functional experience. Chronic discomfort, repeated failures, and the uncertainty associated with compromised implant restorations often have measurable effects on patient satisfaction and quality of life. Studies have demonstrated that persistent pain associated with implant-supported prostheses, particularly when linked to biomechanical disharmony, can significantly reduce patient confidence in dental treatments and create apprehension toward future interventions. In elderly patients, these psychosocial factors become even more relevant, as treatment fatigue and reduced adaptability may affect both treatment acceptance and long-term maintenance.

Furthermore, the growing emphasis on minimally invasive concepts in implantology reinforces the need to adopt therapeutic strategies that balance functional outcomes with biological cost. When anatomical damage is already substantial, as in the present case, clinicians must critically evaluate whether aggressive regenerative procedures would offer predictability comparable to alternative restorative options. Current evidence suggests that, in elderly individuals, regenerative outcomes are often less stable because of age-related changes in bone turnover and reduced vascular supply. These factors may compromise graft incorporation or result in partial regeneration, making extensive procedures less suitable.

Another key point is the importance of interdisciplinary evaluation. Complex cases involving implant malpositioning, limited bone availability, and prosthetic constraints benefit significantly from collaborative assessment among oral surgeons, prosthodontists, and radiologists. Such collaboration allows for a comprehensive treatment plan that accounts for mechanical, aesthetic, and anatomical variables simultaneously. In the literature, interdisciplinary planning has repeatedly been associated with improved rehabilitative outcomes, reduced complication rates, and a clearer estimation of long-term prognosis.

Finally, this case underscores the need for continuous professional development and adherence to evidence-based protocols in implant dentistry. With the proliferation of implant systems, surgical guides, and digital planning software, clinicians have increasing access to tools capable of minimizing human error, provided they are used correctly. Failing to integrate these technologies into clinical workflow can lead to preventable complications, as documented here. As such, ongoing training and mastery of digital planning resources are essential to prevent misalignment errors and ensure that implant placement respects prosthetic, anatomical, and biomechanical principles.

CONCLUSIONS

This case illustrates the severe clinical, surgical, and prosthetic consequences of improperly planned and malpositioned dental implants. The irreversible anatomical damage caused by the initial intervention significantly compromised the possibilities for a future fixed implant-supported solution, ultimately guiding treatment toward a removable prosthetic rehabilitation as the most realistic and minimally invasive option. Accurate diagnosis, appropriate radiographic analysis, and adherence to prosthetically driven planning protocols remain essential to prevent complications of this magnitude. This report reinforces the importance of careful preoperative assessment and evidence-based surgical decision-making to safeguard long-term functional and structural outcomes in implant dentistry. Building on these considerations, this case further highlights how early misjudgments in diagnostic interpretation or surgical execution may generate a cascade of irreversible consequences that progressively reduce rehabilitative options.

Once bone volume, soft-tissue architecture, and prosthetic space are compromised, even advanced regenerative approaches cannot always restore ideal anatomical conditions, especially in elderly patients or in those with limited healing capacity. In such scenarios, the clinician must weigh not only the biological feasibility of reintervention but also the proportionality between surgical invasiveness, expected benefits, and the patient's overall quality of life. Moreover, the case underscores the central role of communication and shared decision-making with patients facing complex implant failures.

Providing clear explanations regarding risks, limitations, and alternative solutions ensures that treatment choices are aligned with patient expectations and clinical reality. Ultimately, this experience reaffirms that modern implant dentistry must prioritize long-term predictability over pursuing fixed solutions at all costs, recognizing that in selected

cases, such as the one presented, removable prosthetic rehabilitation can be a superior therapeutic strategy, both biologically and functionally.

Institutional Ethics Committee Statement:

The study was conducted in accordance with the Declaration of Helsinki.

Informed Consent Statement:

The patient signed the legally required written consent for the prosthetic construction and relining, which also included imaging.

Conflicts of Interest:

The authors declare that there are no conflicts of interest in this study.

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