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Case Report

Soft tissue augmentation with Sub Epithelial Connective Tissue Graft (SECTG) around Peri-implant mucosal dehiscence – A Case Report

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Abstract

Peri-implant mucosal dehiscence poses a significant challenge in dental implantology, impacting both the aesthetic and functional outcomes of implant-supported prosthesis. This case report details the management of peri-implant mucosal dehiscence through soft tissue augmentation, highlighting the procedural approach and outcomes. A 23-year-old female patient wanted replacement of a mobile non-vital tooth in the upper front tooth region. Clinical assessment indicated insufficient soft tissue volume; a thin gingival biotype and RT1 type recession. Peri-implant mucosal dehiscence resulted following implant placement. A Sub-epithelial Connective Tissue Graft (SECTG) was selected to augment the peri -implant mucosa. A six-month post-operative follow-up indicated notable improvement in the peri-implant soft tissue volume and coverage of nearly 95% was achieved with no complications. This case report underscores the effectiveness of connective tissue grafting in managing peri-implant mucosal dehiscence. Comprehensive assessment, meticulous surgical technique, and diligent post-operative care were critical to the successful outcome.

Keywords: Connective tissue graft, dental implants, esthetic outcomes, peri-implant mucosal dehiscence, soft tissue augmentation.

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Introduction

The placement of dental implants presents clinicians with a myriad of challenges, ranging from patient-specific factors to anatomical considerations and surgical complexities[1]. These challenges can significantly impact treatment outcomes and necessitate careful planning and execution to ensure the success and longevity of implant therapy. Achieving optimal soft tissue contours and gingival esthetics around implants is essential for successful implant placement[2]. Inadequate keratinized tissue, mucosal recession, and poor soft tissue quality can compromise the esthetic outcome and increase the risk of peri-implant complications such as mucositis and peri-implantitis[3].

The rates of implant survival, prosthetic stability, radiographic bone loss and infection-free status were crucial parameters to evaluate

the success implant treatment. It has recently been apparent that the existence of peri-implant soft tissue is essential for preserving the stability of the implant over time, improving aesthetic results, and promoting oral hygiene[4].Patients now anticipate their implant treatments to provide them with a tooth replacement that is not only healthy but also aesthetically pleasing, rather than merely functional. Soft tissue augmentation techniques may be required to enhance peri-implant soft tissue architecture, to manage complications and ensure long-term stability[5]. This procedure encompasses various techniques aimed at harmonizing the gingival contours, achieving proper emergence profiles, and mimicking natural gingival characteristics. The significance of soft tissue augmentation in implant dentistry is underscored by its multifaceted impact on both esthetics and peri-implant health [6].

Case Report

A 23-yearold female patient presented at the Department of Periodontia with a history of mobile tooth in the upper front tooth region. The patient wanted a solution more akin to stable natural dentition since she was neither functionally or psychologically satisfied with the discolored mobile tooth. She gave a history of trauma during childhood. On examination, the upper right central incisor was non-vital with mucosal recession [RT 1 – Cairo Classification, Recession Depth – 5 mm, Gingival thickness - <1mm](Fig 1). The IOPA revealed severe root resorption in relation to the tooth (Fig 2).

On the day of surgery, atraumatic extraction of the tooth was performed followed by immediate implant (ø 3.3*13mm) placement (Fig 3). Bone augmentation was done with DFDBA+FDBA combination (Fig 4) and platelet-rich fibrin was placed. Managing the flap was difficult because of the soft tissue deficiency in relation to the implant.

A follow-up with the patient revealed that post-operative healing at the 14th week after implant placement was not favorable.

Fig 1.Recession type 1 [Cairo] REC Depth – 5 mm, GT - <1 mm (Thin biotype)

Fig 2. IOPA revealing severe root resorption of the offending tooth

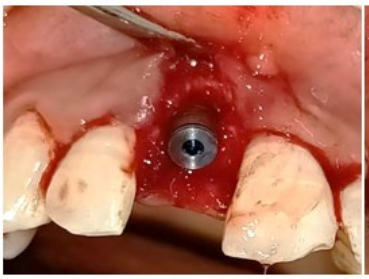

Fig 3.Immediate implant [ø 3.3*13mm] placed after atraumatic tooth extraction

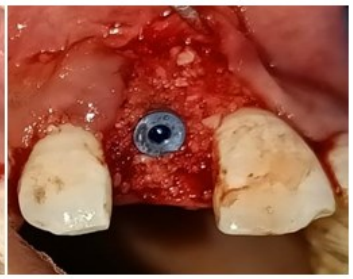

Fig 4.Particulate bone grafting (DFDBA + FDBA) done to augment hard tissue

Fig 5.Buccal cortical plate resorption and peri-implant mucosal dehiscence exposing implant threads (CAL 4 mm) at 14th week following implant placement

Fig 6.SCTG harvested from the maxillary tuberosity region

Fig 7.SCTG [pouch and tunnel technique] stabilized using 4-0vicryl sutures

Fig 8. Post-operative healing after 2 weeks; mild inflammation seen

Fig 9.Cement – retained prosthesis given; 90% coverage achieved at 12-week follow up

Fig 10. 6-month follow up; Continued complete coverage and increased keratinization of the augmented soft tissue

The negative outcomes were buccal cortical plate resorption and peri-implant mucosal dehiscence with a clinical attachment loss of 4 mm, exposing three implant threads (Fig 5). A soft tissue augmentation procedure was scheduled after the healing abutment was placed. The maxillary tuberosity region was utilized to obtain a Sub-epithelial Connective Tissue (SECTG) Graft by a single incision technique (Fig 6). SECTG was stabilized in the recipient site using 4-0 absorbable sutures (Fig 7). At 2- week follow up, mild inflammation was seen with complete coverage (Fig 8). However, at 4 - week follow up, the gingival margin had receded 1 mm (Fig 9). The patient was instructed to stimulate the gingiva manually and was routinely checked on. Continued complete coverage and increased keratinization of the augmented soft tissue was seen at 6-month follow up (Fig 10).

Discussion

The management of peri-implant soft tissue recession presents a significant challenge in implant dentistry, as it affects both the functional and aesthetic outcomes of implant-supported restorations[2,6,7]. This case report demonstrates the successful application of soft tissue augmentation technique to address peri-implant mucosal dehiscence, emphasizing the importance of comprehensive planning, precise execution, and careful post-operative care. Peri-implant mucosal dehiscence can result from a variety of factors, including surgical trauma, poor implant positioning, inadequate keratinized tissue, and biomechanical overload. In this case, the recession was likely multifactorial, involving insufficient initial soft tissue volume and improper implant positioning relative to the alveolar crest. Accurate diagnosis through clinical and radiographic evaluation is crucial in identifying these contributing factors and planning the appropriate intervention. The treatment strategy focused on augmenting the peri-implant soft tissue to enhance the mucosal seal and improve aesthetic outcomes.

A Sub-epithelial Connective Tissue Graft (SECTG) was chosen due to its predictable outcomes and high success rates in increasing the thickness and width of keratinized tissue around implants. The use of a connective tissue graft not only improved the peri-implant tissue volume but also contributed to better plaque control and maintenance of peri-implant health. The SECTG was harvested from the palate and carefully adapted to the recipient site around the implant. This technique, while technically demanding, allows for precise placement of the graft and optimal integration with the existing tissues. Also, gingival stimulation has likely aided in the present case by improving blood circulation. Post-operative follow-up showed significant improvement in the peri-implant soft tissue volume and a reduction in recession, with stable results observed at the six-month mark. The success of the treatment was attributed to meticulous surgical technique, patient compliance with oral hygiene instructions, and regular follow-up visits. These follow-ups included professional cleaning and monitoring for any signs of recurrence or complications.

This case highlights several important considerations[8,9] for clinicians managing peri-implant soft tissue recession:

1. ***Pre-surgical Planning****:* Comprehensive assessment and planning are vital to identify the underlying causes of recession and select the most appropriate augmentation technique.
2. ***Surgical Skill****:* Mastery of soft tissue grafting techniques is essential for predictable and successful outcomes.
3. ***Patient Education and Compliance****:* Ensuring that patients understand the importance of maintaining excellent oral hygiene and adhering to post-operative care instructions is crucial for long-term success.
4. ***Long-term Monitoring****:* Regular follow-up visits are necessary to monitor the health of the peri-implant tissues and intervene early if any issues arise.

Conclusion

The gold standard for peri-implant soft tissue augmentation is the use of autogenous soft tissue grafts. The successful resolution of peri-implant mucosal dehiscence through soft tissue augmentation illustrates the efficacy of this technique in restoring aesthetic and functional integrity.

This case serves as a testament to the importance of careful diagnosis, strategic planning, precise surgical execution, and diligent post-operative care. As dental implantology continues to evolve, further research and clinical trials are needed to refine these techniques and establish standardized protocols.

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