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Case Report

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Management of a Periodontal Intrabony Defect Using the Non-Incised Papilla Surgical Approach (NIPSA) Combined with Sticky Bone: A Case Report

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Abstract

The treatment of periodontal intrabony defects remains a major challenge in regenerative periodontal therapy. Preservation of soft tissue architecture and wound stability are critical factors influencing regenerative outcomes. The Non-Incised Papilla Surgical Approach (NIPSA) is a minimally invasive surgical technique designed to preserve the interdental papilla and marginal tissues while facilitating access to deep periodontal defects. Sticky bone, a combination of particulate bone graft and autologous fibrin, has emerged as a promising regenerative biomaterial due to its enhanced stability and biological properties. A 55-year-old female patient presented with food impaction in the maxillary left canine region. Clinical examination revealed generalized supra- and subgingival calculus with a periodontal pocket associated with tooth 23. Radiographic assessment demonstrated an intrabony periodontal defect. Following Phase I periodontal therapy, regenerative surgery was performed using the Non-Incised Papilla Surgical Approach. Thorough defect debridement was carried out, followed by placement of sticky bone prepared from particulate graft material incorporated within autologous fibrin. The surgical site was stabilized and monitored postoperatively. Results: Clinical evaluation demonstrated satisfactory healing with preservation of interdental papillary architecture and reduction in probing depth. Radiographic examination at three months revealed evidence of bone fill within the defect. No postoperative complications or significant gingival recession were observed. In conclusion, NIPSA combined with sticky bone may represent a predictable and minimally invasive regenerative approach for the management of periodontal intrabony defects, particularly in esthetic areas where preservation of soft tissue contours is essential.

Keywords: Periodontal Regeneration, Minimally Invasive Periodontal Surgery, Intrabony Defect, Guided Tissue Regeneration, Periodontal Surgery, Sticky Bone.

INTRODUCTION

Periodontitis is a chronic inflammatory disease characterized by progressive destruction of the periodontal ligament, cementum, and alveolar bone, ultimately leading to attachment loss and tooth loss if untreated. Intrabony defects represent advanced periodontal destruction and are considered ideal candidates for regenerative therapy due to their potential for periodontal tissue regeneration [1,2].

Over the past decades, various regenerative techniques including guided tissue regeneration, enamel matrix derivatives, biologic mediators, and bone grafting materials have been employed to improve clinical attachment levels and promote bone regeneration [3,4]. Successful periodontal regeneration depends not only on the regenerative material used but also on wound stability, blood supply, and preservation of soft tissue architecture [5].

The Non-Incised Papilla Surgical Approach (NIPSA), introduced by Moreno Rodríguez *et al*., is a minimally invasive periodontal surgical technique that provides access to deep intrabony defects through an apical incision while preserving the interdental papilla and marginal soft tissues [6]. By maintaining the integrity of the papillary tissues, NIPSA improves clot stability, reduces postoperative gingival recession, and enhances esthetic outcomes, particularly in the anterior region [6,7].

Sticky bone, developed by Sohn *et al*., consists of particulate bone graft entrapped within an autologous fibrin matrix. This fibrin network improves graft stability, prevents particle migration, enhances angiogenesis, and serves as a scaffold for cellular migration and osteogenesis [8].

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The synergistic use of NIPSA and sticky bone may provide favorable conditions for periodontal regeneration by combining soft tissue preservation with enhanced graft stability.

Therefore, the present case report describes the management of an intrabony periodontal defect associated with tooth 23 using NIPSA in conjunction with sticky bone and evaluates the clinical and radiographic outcomes following treatment.

CASE REPORT

A 55-year-old female patient reported to the Department of Periodontology with a chief complaint of food lodgement in the upper left anterior region for one month.

The patient was systemically healthy with no significant medical, family, or personal history.

Clinical examination revealed generalized supra- and subgingival calculus deposits and a periodontal pocket associated with tooth number 23 (Figure 1).

Figure 1: Clinical evaluation revealing 9 mm periodontal pocket wrt #23

Radiographic evaluation demonstrated the presence of an intrabony periodontal defect in the affected tooth (Figure 2).

Figure 2: Radiographic Evaluation revealing vertical bone defect

Based on clinical and radiographic findings, the patient was diagnosed as Localised Stage III Grade B periodontitis.

Initial periodontal therapy consisted of oral hygiene instructions, ultrasonic supragingival and subgingival scaling, and saline irrigation. Following reevaluation and satisfactory plaque control, regenerative periodontal surgery was planned.

Under local anesthesia and strict aseptic conditions, a single horizontal slightly curved mucosal incision was placed apical to the defect beyond the mucogingival junction following the principles of the Non-Incised Papilla Surgical Approach (Figure 3).

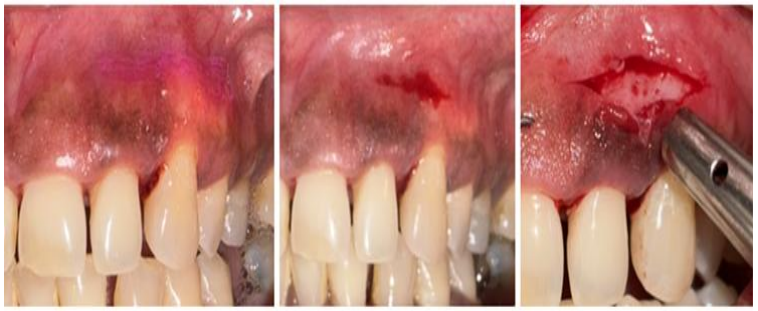

Figure 3: Incision design and placement

Full access to the intrabony defect was achieved without disturbing the interdental papilla. Thorough defect debridement and root surface decontamination were performed (Figure 4).

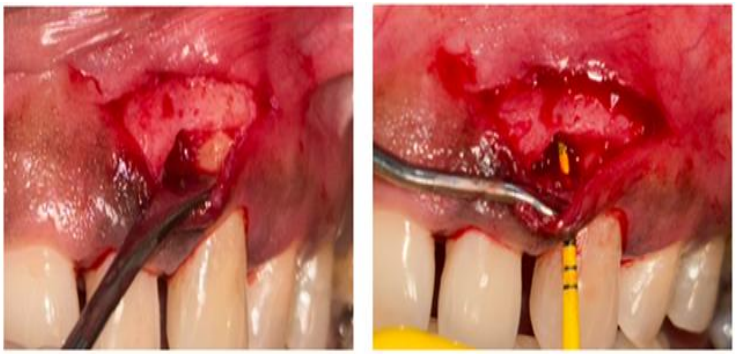

Figure 4: Defect debridement and root surface decontamination

Sticky bone was prepared by combining particulate bone graft material with autologous injectable prf which was prepared by centrifuging 10 mL of venous blood at a speed of 700 rpm for 4 mins, creating a cohesive graft mass. The prepared sticky bone was placed into the defect and adapted carefully to fill the osseous defect (Figure 5). The flap was repositioned and stabilized using simple interrupted sutures to ensure primary wound stability.

Figure 5: Placement of sticky bone and sutures

Postoperative care included oral hygiene reinforcement and periodic follow-up examinations. Healing was uneventful. At one-week, soft tissue healing was satisfactory. Clinical and radiographic evaluations performed after 1 and 3 months demonstrated reduction in probing

depth, maintenance of soft tissue contours, and evidence of bone fill within the defect (Figure 6 and 7).

At 1 month re-evaluation healing was satisfactory with a reduction in probing depth up to 4 mm.

Figure 6 : Re-evaluation at 1 month reveals reduction in probing depth

At 3-month reevaluation the clinical parameters remained stable, a radiographic assessment was carried out revealing a radiographic bone fill.

Figure 7: Re-evaluation at 3 month reveals radiographic bone fill

DISCUSSION

The primary objective of periodontal regenerative therapy is to restore the lost periodontal apparatus, including alveolar bone, periodontal ligament, and cementum. Achieving predictable regeneration requires adequate defect access while preserving soft tissue integrity and ensuring wound stability [3,5].

In the present case, a deep intrabony defect associated with tooth 23 was treated using nipsa combined with sticky bone. The decision to employ nipsa was based on the need to preserve the interdental papilla and marginal tissues in an esthetically sensitive area. Unlike conventional flap designs, nipsa provides surgical access through an apical incision, thereby maintaining the integrity of the papilla and minimizing postoperative recession [6].

Moreno rodríguez *et al*. Reported that preservation of the marginal soft tissues creates a protected regenerative chamber that enhances blood clot stability and facilitates periodontal wound healing [6]. Similarly, cortellini and tonetti demonstrated that minimally invasive surgical techniques result in improved clinical attachment gain and radiographic bone fill owing to reduced surgical trauma and enhanced wound stability [7,9].

Sticky bone was selected as the regenerative material because of its biologic and mechanical advantages. The fibrin matrix entraps graft particles into a cohesive mass, improving handling characteristics and preventing displacement during healing [8]. Furthermore, the fibrin network acts as a reservoir for growth factors and promotes angiogenesis, cellular migration, and osteoblastic activity, all of which contribute to bone regeneration [8,10].

The favorable clinical outcomes observed in the present case, including reduction in probing depth, preservation of soft tissue contours, and radiographic evidence of bone fill after three months, may be attributed to meticulous defect debridement, maintenance of wound stability through nipsa, and the regenerative potential of sticky bone. These findings are in agreement with previous reports demonstrating improved regenerative outcomes when minimally invasive surgical techniques are combined with biologically active grafting materials [7,9,10].

Although the results were encouraging, the present report represents a single clinical case with a relatively short follow-up period. Long-term prospective studies and randomized controlled clinical trials are required to validate the effectiveness and predictability of nipsa in combination with sticky bone for the management of periodontal intrabony defects.

CONCLUSION

NIPSA combined with sticky bone demonstrated favorable clinical and radiographic outcomes in the management of an intrabony periodontal defect. The technique effectively preserved interdental papillary tissues, minimized gingival recession, and promoted periodontal regeneration. This minimally invasive approach may be considered a valuable treatment option for regenerative management of intrabony defects, particularly in esthetically demanding regions.

Conflicts of Interest

The author reports no conflicts of interest.

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