



## Management of Self-inflicted Traumatic Bone Defect Using NIPSA- A Rare Case Report

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### KEYWORDS

Periodontal regeneration, self-inflicted injury, Splinting, minimally invasive surgery.

### ABSTRACT:

Orthodontic treatments deliver proper controlled forces for tooth movement. Uncontrolled and improper forces to the teeth result in severe damage to the periodontium resulting in severe bone loss and resulting in tooth mobility. Periodontal regeneration aims to recover the lost periodontal tissues. Though periodontal regeneration is successful, the conventional regenerative procedures resulted in loss of interdental papilla. Hence Minimally Invasive Surgical Techniques were introduced. The non-Incised Papilla Surgical approach is a minimally invasive procedure which is aimed to treat isolated severe bone defects with one mucosal incision at the apical end. In this case report a young patient with self-inflicted trauma with severe bone loss is treated with NIPSA (Non-Incised Papilla Surgical Approach) which resulted in reduction of mean Probing pocket depth and with good bone fill postoperatively after 6 months without compromising the esthetics.

### 1. Introduction

Tooth loss due to the trauma to the supporting structures of the tooth is highly prevalent now. The teeth which undergo severe trauma will have areas of tension and pressure within the surrounding periodontium<sup>1</sup> this in turn results in the adaptive remodelling of the periodontium resulting in a reduction in the alveolar bone and an increase in tooth mobility due to the widening of the PDL<sup>2</sup> space. Tooth with severe trauma and bone loss when left untreated will result in the loss of the teeth<sup>3</sup>. The conventional periodontal regeneration methods resulted in reduced probing pocket depth and elimination of osseous defects but also resulted in loss of interdental papilla<sup>4</sup>. This loss of Interdental papilla resulted in unesthetic appearances, especially in the anterior region. Non-incised papilla surgical approach (NIPSA)<sup>5</sup> is a minimally invasive surgical technique that aims to treat severely compromised teeth with severe bone defects without incising the papilla. It has produced promising results. This case report aims to present the management of a patient with self-made trauma resulting in vertical bone loss and mobility of the teeth using the NIPSA technique and Allogenic bone material.

### 2. CASE REPORT:

A 32-year male systemically healthy, nonsmoker came to the outpatient department with a chief complaint of mobile left maxillary central incisor. History revealed that the patient is a post-orthodontic patient who had a relapse in the upper anterior region. owing to that the patient himself on watching a YouTube video (Link not disclosed by the patient) had worn a rubber band for the past month every night for about 6 hours confining to 11, 21 and 22 region. On examination, the patient had grade II mobility of 21 with an average probing pocket depth of about 6mm with the presence of exudate. Due to severe chronic trauma to the tooth, the vitality of the tooth was also found to be compromised. On radiographic examination there was the presence of a severe intrabony defect around the teeth (Fig:1).



Fig :1 Pre-operative clinical photograph and radiograph indicating the presence of radiolucency around 21



indicating the presence of intrabony defect and abscess confining to 21 area.

After diagnosis the patient received initial periodontal therapy which included thorough prophylactic scaling following which the teeth were splinted with Interlig fiber splint (Fig:2). The splinting was done from 33 to 43 to stabilize 21. Following splinting the region was well curretted and root planing was done using GRACEY #1,2 followed by a 5days course of antibiotics (C Amox-500mg, T Metronidazole-400mg), Root canal treatment was done for the tooth and is waited for about a month. Then the patient is examined again and is planned for NIPSA (Non incised papilla surgical approach) to regenerate the lost periodontal support. The region to be operated is anesthetized with 2% lignocaine. A horizontal incision is given at 2mm apical to the base of the defect at the alveolar mucosa (Fig:2b). A full-thickness flap (Fig:5) is reflected to get access to the defective area. Allogenic bone material (Rocky Mountain) is placed (Fig:2c) and the site is sutured with 5-0 Vicryl (Fig:2d) Immediate post-operative radiograph (Fig:8) is taken and post-op instructions were given. The patient is recalled after a week to assess post-operative healing.

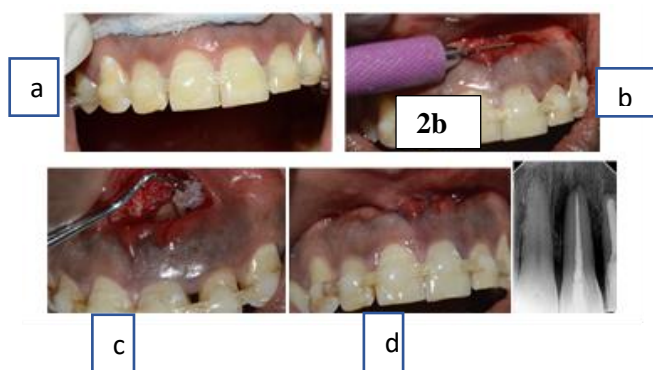


Fig:2: Fig 2a: splinting in relation to 13 to 23 with interlig, Fig 2b: Horizontal incision at the mucosa, Fig 2c: Placement of bone graft, Fig 2d: suturing done, Fig 2e: Immediate postoperative radiograph.

The post-op healing was uneventful. clinical pictures (Fig:3a) and Radiograph (Fig :3b) were taken for the patient at 6 months post-op, and it has been observed that the mobile teeth were completely stable, and the mean probing depth was about 3.2mm with no change in keratinized tissue width, papillary height and >5mm of bone gain in the defect region.

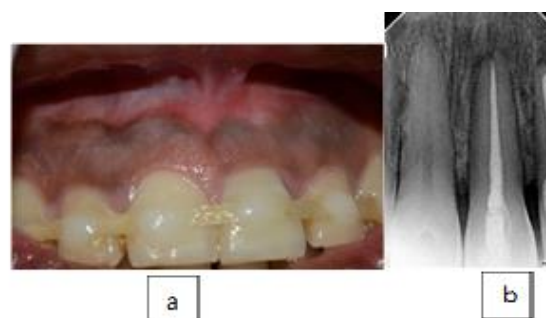


Fig 3: Fig 3a:6months post-operative clinical photograph showing good healing with no compromised esthetics,3b: Post-operative radio graph showing bone fill confining to 21 region.

### 3. Discussion

The periodontal regeneration in recent years focuses mainly on the preservation of the interdental papilla through a minimally invasive flap design to achieve primary wound closure as well as good attachment gain and regeneration of lost tissues. The loss of interdental papilla especially in the maxillary anterior region will result in an unesthetic appearance resulting in a black triangle<sup>6</sup>. The non-incised papillae surgical approach (NIPSA)<sup>5</sup> is a technique used for the regeneration of large intrabony defects by giving a single mucosal incision at the apical end of the defect preserving the marginal tissues and interdental papilla.

Moreno Rodriguez et al. (2018)<sup>5</sup> first reported the NIPSA approach compared with the Minimally invasive surgical technique and found a better clinical attachment gain in the NIPSA approach. Ruiz and Caffesse (2019)<sup>7</sup> also found that there was a significant papillary recession in MIST with no recession in NIPSA.

Moreno Rodriguez et al. (2018)<sup>8</sup> also reported a case series comprising about 10 patients with intrabony defects who were treated with NIPSA with hydroxyapatite-based graft biomaterial and enamel matrix derivative in which Probing pocket depth was  $9.6 \pm 2.3$  mm before surgery and  $2.3 \pm 0.5$  mm post-surgery. Clinical attachment level (CAL) decreased from  $10.4 \pm 2.7$  mm to  $3.1 \pm 0.87$  mm post-surgery. The gingival papilla height, keratinized tissue width, and buccal gingival margin remained stable over time.

In a study by Rampalli Viswa Chandra in 2022<sup>9</sup> it was found that NIPSA and the Entire papilla preservation technique had comparable results in terms of clinical



attachment gain, PPD, and bone fill with NIPSA being superior in Clinical attachment gain and with minimal papilla loss ( $1.71 \pm 0.47$  to  $1.73 \pm 0.77$  mm)

In a case series by Gullermo-pardo Zamora in 2021<sup>10</sup> NIPSA along with L-PRF seemed to produce a better reduction in PPD, and CAL as well as there was a better improvement in marginal soft tissue with minimization of soft tissue contraction. A mean PPD reduction of  $4.75 \pm 1.08$  mm and a mean CAL gain of  $5.5 \pm 0.5$  mm was observed.

In this case report we aimed to treat a young patient with self-inflicted trauma which resulted in severe bone loss worsening the periodontal status of the patient. NIPSA technique provided promising results in the reduction of the mean PPD and resulted in good bone fill postoperatively. There was also no difference in keratinized tissue width both pre- and postoperatively.

### Conclusion:

DIY remedies for dental problems are among the serious issues worldwide that mislead people resulting in permanent damage to the oral cavity. Developing awareness among the patients will prevent such cases in the future. Minimally invasive periodontal regeneration is one promising field in dentistry that can restore a lost periodontal apparatus without compromising esthetics.

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