



Received on 10 March 2023; received in revised form, 06 May 2023; accepted, 31 May 2023; published 01 November 2023

## EXCISIONAL NEW ATTACHMENT PROCEDURE

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### Keywords:

Subgingival curettage, Internal bevel incision, New attachment

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**ABSTRACT:** Periodontitis is a complex infectious disease of supporting structures of teeth caused by specific microorganisms or groups of microorganisms. Formation of a new connective tissue attachment and bone deposition are the main goals of periodontal therapy. The excisional new attachment procedure (ENAP) is especially sub-gingival curettage performed with a knife performed by internal bevel incision performed and excision of tissue. It is indicated in localized, mild to moderate periodontitis, mainly in the anterior region. The main advantage over traditional curettage is the definitive, clean excision of the junctional epithelium and the adjacent tissue with a greater probability of new clinical attachment. The post-surgical recession and root sensitivity are minimized by using this technique. There is no significant tissue loss in this procedure. The benefits of the excisional new attachment method in periodontics are emphasized in this article.

**INTRODUCTION:** The ultimate goal of periodontal therapy is the formation of a new attachment apparatus and this can be achieved by preventing epithelial migration on the treated root surfaces. To prevent epithelial migration, a number of interventions are there, including tissue regeneration, flap surgeries, and curettage. Traditional surgical techniques are successful in pocket elimination. Gold standard debridement for periodontal disease is conventional debridement<sup>1</sup>. The primary approach in controlling periodontal pathogens constitutes scaling and root planing, with or without periodontal surgery, along with proper oral hygiene. The new attachment procedure is the reunion of connective tissue by the formation of new cementum with the insertion of collagen fibers on the root surface that has been deprived of its periodontal ligament.

The Excisional New Attachment Procedure has been reported as “curettage with a scalpel”<sup>2</sup>. The removal of pocket epithelium is the main objective of this procedure<sup>3-5</sup>.

Proper preparation of the tissues for healing by new attachment must include

- Complete removal of the epithelial lining of the pocket wall<sup>6-15</sup>.
- Thorough scaling and root planing to remove debris, calculus, and necrotic cementum<sup>7, 11, 14, 16-21</sup>.
- Removal of all granulosomatous tissue<sup>12, 14, 22</sup> and
- Tight adaptation and immobilization of the soft tissues to the tooth<sup>11, 15, 17, 23-28</sup>.

The most widely used technique to achieve new attachment in suprabony pockets is subgingival curettage<sup>29-32</sup>. However, past results indicate that soft tissue curettage may not be a reliable procedure for gaining new attachment owing to technical problems of execution, particularly access

<b>QUICK RESPONSE CODE</b> 	<b>DOI:</b> 10.13040/IJPSR.0975-8232.14(11).5231-35
	This article can be accessed online on <a href="http://www.ijpsr.com">www.ijpsr.com</a>
DOI link: <a href="https://doi.org/10.13040/IJPSR.0975-8232.14(11).5231-35">https://doi.org/10.13040/IJPSR.0975-8232.14(11).5231-35</a>	

to and visualization of the root surface and proper management of the soft tissue wall<sup>11</sup>. Accordingly, the excisional new attachment procedure (ENAP), which is a definitive subgingival curettage, was developed to accomplish proper soft tissue preparation, gain better access to the root surface, and take advantage of new knowledge of wound healing mechanisms<sup>31</sup>.

**Procedure:** ENAP was developed by US Naval Dental Corps based on the studies by Yukna and colleagues (1976)<sup>32</sup>. Unlike scaling and curettage, the ENAP was developed to ensure the complete removal of sulcular epithelium, epithelial attachment, granulated and inflamed connective tissue, and softened cementum. The procedure is as follows:

1. Ensure the zone of keratinized tissue is sufficient and the pockets do not extend the mucogingival junction.
2. Following local anesthesia, an internal bevel incision was performed with a surgical knife (Bard-Parker blade no. 11 or 15). The incision extends from the margin of the free gingiva apically to a point below the bottom of the pocket. Retain interproximal tissues as much as possible. Removal of inner portion of the soft tissue wall of the pocket is the main objective.
3. To achieve a smooth hard surface, the excised tissue should be removed with a curette and root planing should be performed on all

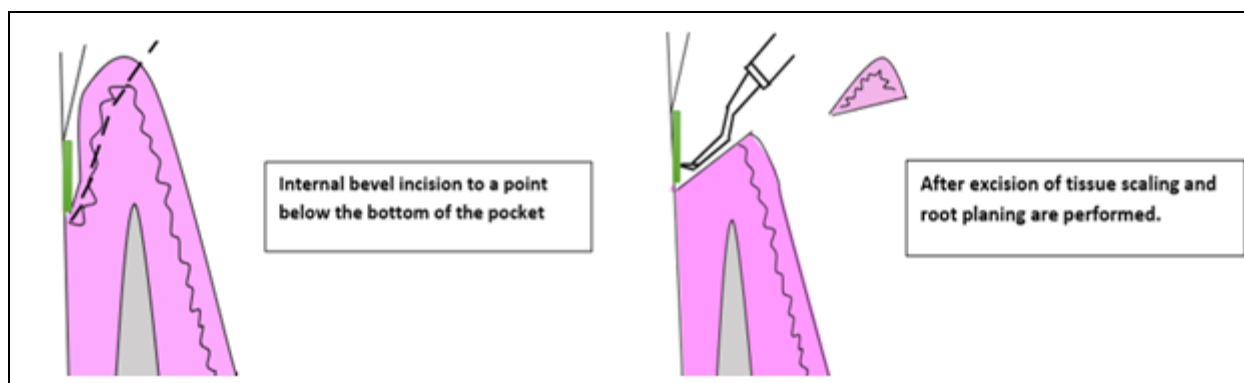
exposed cementum. Preserve all connective tissue fibers that remain attached to the tooth surface.

4. If the wound edges do not passively meet, approximate them and reshape the bone as necessary to achieve adequate wound edge adaptation.

The initial success of the new attachment procedure is dependent upon

- ❖ Correct management of the soft tissue wall through definitive excision,
- ❖ Adequate preparation of the tooth surface through root planing,
- ❖ Approximation of wound surface with the root through positive pressure, and
- ❖ Initial closure of interproximal wounds<sup>32</sup>.

In contrast to pockets that extend over the mucogingival junction, this technique is specifically for the keratinized gingiva. Since tissue repositioning is intended, no vertical or relaxing incisions are made. However, if necessary, ENAP can be extended into a flap<sup>33</sup>. The Excisional New Attachment Procedure, on brief examination, may appear to be identical with the unrepositioned flap<sup>28</sup>, the Widman flap<sup>19</sup>, replaced graft<sup>34</sup>, or mini-flap<sup>17</sup>, however, several important differences exist.



### Objectives:

1. Enable thorough soft tissue preparation.
2. Ensure better access to the root surface.
3. Advantages over traditional subgingival curettage is the definitive, clean excision of the junctional epithelium and the subjacent tissue with new clinical attachment<sup>32,33</sup>.

**Indications:**

1. Suprabony pockets coronal to mucogingival junction.
2. Sufficient keratinised tissue.
3. Localized, mild to moderate periodontitis, particularly in the anterior region<sup>35</sup>.

**Contraindications:**

- 1) Pockets that extend beyond the mucogingival junction
- 2) Edematous tissue
- 3) Lack of keratinized tissue
- 4) Osseous defects have to be treated
- 5) Hyperplastic tissue
- 6) Close root proximity
- 7) Furcation involvement<sup>32,33</sup>

**Advantages:**

- 1) Enhanced root visualization
- 2) Sulcular epithelium and epithelial attachment were completely removed
- 3) Less gingival trauma
- 4) No loss of keratinized gingiva<sup>32</sup>

**Disadvantages:**

- 1) Determining the apical extent of epithelial attachment is difficult
- 2) In some instances, ENAP does not result in new attachment<sup>32</sup>

**Healing Following ENAP:**

A) 0 day (immediately postoperative). The epithelial lining of the pocket was completely eliminated by the incision. The root surfaces were smooth, but not devoid of cementum in most instances. An intervening fibrin clot could be seen occasionally between the cut connective tissue surface and the root<sup>33</sup>.

B) 30, 90 and 180 days postoperative. There was a long, thin junctional epithelium which was usually less than eight cells thick. In majority of the sections, an intraepithelial split was evident with a layer of epithelial cells remaining attached to the root. The thin junctional epithelium showed no ulceration and no rete ridges extending into the lamina propria. Minimal round cell inflammatory infiltrate was evident in the corium subjacent to the junctional epithelium. The re-formed lamina propria showed numerous, dense bundles of connective tissue or a more dispersed, spindly fiber arrangement. The stroma was extremely cellular and the fibres were well-formed but few in number in the latter type of healing connective tissue. In both conditions, the fibre alignment was often parallel to the root surface. Occasionally, areas of apparent new connective tissue attachment with evidence of new cementoid-acellular cementum formation were seen apical to the junctional epithelium, but the relationship of these areas to the surgical field could not be determined definitively due to the lack of a consistent histologic marker denoting the depth of the incision and root planing. Rarely, areas of root resorption were observed, which were surrounded by epithelium and connective tissue in various sections<sup>33</sup>.

**ENAP Modification:** In 1977, Fredi and Rosenfeld modified the technique by advocating a partial-thickness inverse beveled incision down to the crest of bone to remove the periodontal ligament completely. To the presurgical height, the flaps were then sutured. The technique is basically similar in all other aspects<sup>35</sup>.

**DISCUSSION:** The excisional new attachment procedure is a simple and effective method for pocket elimination in supra-bony pockets. The term reattachment means a new attachment of the soft tissue wall of periodontal pocket from which it had been detached previously by disease. Histological evaluation showed a long, thin junctional epithelium with a minimal amount of inflammatory infiltrate in the lamina propria. Several studies demonstrated that there was significant improvement in clinical and radiographical parameters following ENAP.

Laser procedure was compared with ENAP and the results indicated that there was a significant reduction in probing depth following ENAP. Reduction in probing depth is due to the complete removal of sulcular epithelium and gaining soft tissue attachment to the tooth surface.

Priyanka Kumari *et al* in 2021<sup>2</sup> examined twenty periodontal pocket sites of  $\geq 5$ mm in systemically healthy patients and randomly allocated to either (ENAP) Excisional New Attachment Procedure or (LANAP) Laser Assisted New Attachment Procedure. The result revealed statistically insignificant difference in both groups however clinically significant reduction in probing depth was seen with ENAP as compared to LANAP but laser procedure had less VAS scores as compared to ENAP.

Sameera *et al* in 2018<sup>4</sup> carried out a split-mouth double-blind controlled trial in 15 subjects with chronic periodontitis. In every patient, 2 quadrants were treated with ENAP and the other 2 quadrants with LANAP. Both the groups showed statistically significant reduction in all the clinical parameters when compared from baseline to subsequent follow-up visits.

There was greater reduction in all the parameters in LANAP group than that of ENAP group. The rate of revascularization was higher in ENAP group than that of LANAP group when compared from baseline to the ninth day postoperatively.

Arif Gudakuwala *et al* in 2018<sup>37</sup> carried out a split-mouth study in 10 subjects with chronic periodontitis. Following phase 1 therapy, periodontal pockets in one sextant were subjected to ENAP and another was subjected to irradiation by diode laser. Both procedures were effective but the use of diode laser was associated with more evident results.

Mohammed M. A. Abdullah in 2013<sup>36</sup> evaluated clinical and microbiological comparison of excisional new attachment procedure (ENAP) with subgingival metronidazole 0.5% and chlorhexidine gluconate solution 0.2% irrigation. Sixty patients with moderate to severe chronic periodontitis were subjected for ENAP and divided into three groups. The apparent significant differences were detected in all clinical parameters of the patients treated with

ENAP plus antimicrobial solutions and the patients treated with ENAP alone at baseline, 3 months and 6 months, there were improvement in plaque index, gingival index and reduction in periodontal pocket depth in the side treated with ENAP plus antimicrobial solutions more than the treated with ENAP alone. There were significance differences in gram (+) bacteria in all groups of the present study intervals compared to base line interval. There were significance differences in gram (-) bacteria in all groups of the present study intervals. D. D'Archivio *et al* in 1999<sup>3</sup> examined twenty-seven patients with moderate periodontitis. In each of them root planing was performed in a half of the oral cavity (control site) and the ENAP in the other half (test site). Results showed that better improvements were found in PD (Probing depth) and AL (Attachment loss) values in teeth treated by ENAP compared to those treated by root planing.

**CONCLUSION:** Considering the constraints of this method, we draw the conclusion that teeth treated with ENAP showed higher improvements in probing depth and attachment level values. It lessens the need for additional surgical intervention. ENAP was designed to ensure full removal of sulcular epithelium, inflammatory and granulated tissue, subgingival calculus, and softened cementum, in contrast to scaling and curettage. Though ENAP procedure is restricted to keratinised gingiva, it is an efficient and predictable way to eliminate suprabony pockets by creating a new attachment of gingival tissues. However, the long-term success of the excisional new attachment procedure must be studied longitudinally for an even longer period of time.

**ACKNOWLEDGEMENT:** Nil

**CONFLICT OF INTEREST:** Nil

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**How to cite this article:**

Kalaiyazhagi M, Sangeetha S, Savithri NK, Kumar NG, Shankar NG and Nivetha R: Excisional new attachment procedure. *Int J Pharm Sci & Res* 2023; 14(11): 5231-35. doi: 10.13040/IJPSR.0975-8232.14(11).5231-35.

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