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Enhancement of Intrabony Defects with Minimally Invasive Surgical Techniques

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ABSTRACT
Minimally invasive surgical techniques in periodontology with the use of magnification tools enables gentle tissue manipulation with performing minimal incisions and flap elevations in the field of surgical treatment of intrabony defects. The resolution of the disease and regeneration if possible with minimal postoperative pain and morbidity. Minimally invasive surgical techniques focuses on the conservative elevation of both buccal and lingual flaps of the defect-associated interdental papilla. Depending up on the width of the interdental space, the papilla may be dissected either diagonally or horizontally. Minimally invasive surgical techniques induces minor surgical trauma and improves the wound stability with favourable results in terms of clinical outcomes and the patients comfort. Minimally invasive surgical techniques are as effective as the conventional Papilla Preservation Flap(PPF)Techniques. Many favorable clinical outcomes were observed in the studies in which Minimally invasive surgical techniques were applied, while the patient perception of the periodontal surgery was improved.

keywords: Minimally Invasive Surgical Techniques, Period ontology, Intrabony defects

I. INTRODUCTION:

Regeneration of lost periodontal tissues has always been the ultimate goal of periodontal therapy. Periodontal regeneration of intrabony defects has been achieved with different principles. They are barrier membranes, demineralized freeze-dried bone allograft,a combination of barrier membranes and grafts, and enamel matrix derivative (EMD).[1]

The successful regeneration of intrabony defects depends mainly on 2 factors-the surgical technique and the selected biomaterials.[13] Several clinical studies have been conducted aiming to evaluate the efficacy of MISTS with or without the adjunctive use of biomaterials and define the best modality for intrabony defects.

These new perspectives have led more clinicians to apply MISTs in the treatment of intrabony lesions, when it was indicated. The aim of this literature review was to present MISTs for the regeneration of intrabony defects and the impact of these surgical techniques.

MINIMALLY INVASIVE SURGICAL TECHNIQUES FOR THE TREATMENT OF INTRABONY DEFECTS:

The enamel matrix derivative Emdogain has been widely used for the regeneration of intrabony defects alone or in combination with other biomaterials and different surgical techniques, leading to various outcomes.[32] EMD and amelogenins stimulate growth of multiple mesenchymal cell types including fibroblasts, cementoblasts, osteoclasts and stem cells. It acts as a tissue-healing modulator mimicking the events that occur during root development and helps to stimulate periodontal degeneration.

Videoscope -assisted minimally invasive surgery (V-MIS) in combination with EMD and DFDBA was also performed for the regenerative treatment of 1-,2- and 3-walled defects.[17,39,40]

MISTs were applied in conjunction with guided tissue regeneration (GTR) and a hydroxyapatite (HA)-based biomaterial. Twenty-four intraosseous defects were treated with MISTs+HA /GTR or MISTs alone.It was concluded that MIST with and without HA /GTR should be considered as a valuable minimally invasive approach in the treatment of deep intraosseous periodontal defects.[41]

Minimally invasive surgical techniques have also been evaluated with growth factors. Mishra et al. assessed the impact of the addition of the recombinant human platelet-derived growth factor BB (rhPDGF-BB) gel on the efficacy of MISTs.[30]

Minimally invasive surgical techniques gave a new perspective with regard to the periodontal regeneration of isolated and multiple intrabony defects, aiming to reduce the invasiveness of the surgery and patient morbidity as well as chair time. The use of microsurgical instruments and high magnification as well as the introduction of the videoscope made the single-flap MIST a feasible treatment modality in isolated 1-,2-,and 3- wall interproximal defects, which can

be accessed and effectively debrided through a buccal or lingual flap window.[17,19,24] The double-flap MIST was considered suitable for the treatment of intrabony defects with pure 3-wall,or shallow 2- and/ or 1- wall subcomponents.[23]

It has been reported that the application of MISTs in the treatment of intrabony defects induces subtle postoperative pain and decreases patient morbidity. The lesser invasiveness and the minimal surgical trauma caused by MISTs reduces the patient's discomfort and need for painkiller consumption, irrespective of the type of regenerative materials applied. Moreover, the perception of the post-surgical pain and the amount of analgesics taken by patients as well as the overall chair time have been found to be significantly lower for the MIST procedures as compared to the conventional surgical techniques.[10,46] It has also been noted the absence of membrane exposure in the patients treated with bio resorbable membranes and bone graft. This was another benefit of MISTs, which increased their efficacy in the treatment of intrabony defects, as membrane exposure has been proven to jeopardize the clinical outcomes of regenerative therapy.[24,48]

II. CONCLUSION

Minimally invasive surgical techniques significantly decreased surgical trauma in the soft tissues and the rates of wound closure failure after the periodontal surgery. As a consequence, many favourable clinical outcomes were observed in the studies in which MISTs were applied, while the patient perception of the periodontal surgery was improved.

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