



FAILURES IN PERIODONTAL THERAPY

Dental Science

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ABSTRACT

Studies have shown that modern periodontal therapies are fruitful in preserving a healthy natural dentition as well as preside over periodontal diseases. There are N number of treatment strategies and various modern techniques have been designed and traced to treat periodontal diseases. Most of these procedures have drawbacks which were identified, leading to the modifications of the original technique which lead to better treatment options, but still very less emphasis have been laid on failures. There is a chance of loss of treatment benefit and recurrent periodontitis, without a regular program of reevaluation, plaque control, oral hygiene instructions and reassessment of biochemical factors. This review explains about different periodontal therapies and some failures associated with those therapies.

KEYWORDS

Local drug delivery, frenectomy, gingivectomy.

INTRODUCTION

Gingivitis & periodontitis have troubled humans since the beginning of the history. Gingival & periodontal diseases are the most common dental diseases to affect humans though it dates back to 2500 B.C. Since then, numerous treatment strategies and various techniques have been designed & traced to treat periodontal diseases. All these therapies have their own advantages & limitations. All these procedures had failures which were identified leading to the modifications of the various techniques which results in better treatment options, but very less emphasis has been laid on failures.¹ Therefore, this review describes most common failures associated with periodontal therapies and also discusses the possible solutions to reduce the occurrence of failures in periodontal therapies.

The concept of successful periodontal therapy must be defined first to discuss treatment failures. Persistence of residual periodontal pockets, presence of bleeding and/or pus on probing, increase in loss of attachment or persistence of tooth mobility after completion of comprehensive periodontal therapy would be criterias to categorize a periodontal case as failure¹. The causes for failure are multifarious. In addition to the fact that periodontal therapy always takes place in regions exposed to plaque formation, failures may be ascribed to the following factors:

1. Incorrect patient selection³
2. Incomplete diagnostic procedures, improper diagnosis, and incorrect prognosis⁴
3. Difficult (or inappropriate) treatment⁴
4. Unsupervised healing and absence of maintenance therapy^{2,5,6,7}.

FAILURES ASSOCIATED WITH NONSURGICAL PERIODONTAL THERAPY

Objectives of nonsurgical periodontal therapy include: A) Replacement of pathological microflora with the sparse microflora found in health. B) conversion of inflamed pathologic pockets to healthy gingival tissue. C) shrinkage of deepened pockets to a shallow healthy sulcus. D) Achievement of a root surface compatible with a healthy connective tissue and epithelial attachment.²

SCALING AND ROOT PLANING

Failures associated with SRP include:

- 1) Persistence of inflammation because of residual embedded calculus.
- 2) Condition of the instruments
- 3) Faulty techniques of instrumentation²
- 4) The failures of root planing can be defined as the presence of a

rough root surface or persistence of inflammation. Over instrumentation of root surface removes the unaltered cementum and may result in exposure of dentin especially in the cervical regions where the cementum is the thinnest. This may result in sensitivity and the area may also prone for root caries.

- 5) Conventional nonsurgical mechanical therapy is usually performed in a quadrant-wise or sextant-wise manner.
- 6) Conventional mechanical surgical root debridement doesn't usually eradicate *A.actinomycetemcomitans*, *P.gingivalis*, *P.intermedia*, *B. forsythus*, *P.micros*, enteric rods and probably additional microbial taxa, from the subgingival ecosystem.

FAILURES ASSOCIATED WITH FRENECTOMY

Frenectomy procedures may fail due to i) Improper incision design will result in the reattachment of the frenum & failure to serve the underlying periosteal attachment, so care should be taken to design the incision and to completely remove the muscle fibre attachment and ii) If sutures are not placed properly gaping of the wound may occur. This will leads to hindrance in healing. In the changing era of periodontal surgeries one innovative remedy has ended the inconvenience of suturing by the development of fibrin glue. It allowed the clinician to meet growing expectations and demands of today's dental patient.¹⁰

Jathal et al conducted a study on use of fibrin glue in periodontal flap surgery and stated that In the changing era of perio surgeries one innovative remedy has ended the inconvenience of suturing and has allowed the clinician to meet growing expectations and demands of today's dental patient, and the remedy is fibrin glue.

FAILURES ASSOCIATED WITH CROWN LENGTHENING

Failures associated with this procedure are primarily due to

- i) Violation of the biological width which results in inflammation of the gingiva. So, the minimum distance between the bone crest & the gingival margin should be 3 mm or more to prevent impingement of the restoration on to the biologic width.
- ii) Excessive removal of the bone during surgical crown lengthening can lead to down gradation of the prognosis of the tooth. Hence, optimum bone removal should be planned to maintain the biologic width as well as bone support of the tooth.¹¹

Babaloo et al conducted a study based on Evaluation of the Prevalence of Different Treatment Failure Modes after Crown Lengthening Surgical Procedure in Advances in Bioscience and Clinical Medicine 2016 and he concluded that during the 6th postoperative week the crown lengthening procedures exhibited a 14.5% failure rate and a lack of sufficient keratinized gingiva around the tooth was the most frequent reason for early failures of such procedures.

FAILURES ASSOCIATED WITH DEPIGMENTATION

Failures associated with this procedure are mainly due to smoking. An increase in melanin pigmentation is associated with increase in smoking. If the procedure of depigmentation is carried out with electrocautery, care should be exercised to prevent necrosis of bone. So, contact of the cautery instruments with underlying bone should be avoided. Use of chemicals during depigmentation may damage the bone and underlying tissue as the depth of action of these chemicals are not controlled.¹²

FAILURES ASSOCIATED WITH GINGIVECTOMY

Failures is mainly due to 1) Unsuitable case selection. Cases with underlying osseous irregularities or intrabony defects. 2) Incorrect pocket markings. 3) Incomplete pocket elimination. 4) Insufficient beveling of the incision. 5) Failure to remove tissue tags, resulting in excessive tissue. 6) Failure to remove etiologic factors-calculus and plaque. 7) Beginning or terminating the incision in a papilla. 8) Failure to eliminate or control the predisposing factors. 9) Inaccessible interdental spaces. 10) Loose dressings. 11) Lost dressings. 12) Failure to prescribe stimulators or rubber tipplings for the interproximal use. 13) Insufficient use of dressings. 14) Failure to use stimulators or rubber tips. 15) Failure to complete treatment.

FAILURES NOTICED WITH TREATMENT OF FURCATION INVOLVED TEETH

Failures associated with furcation involved teeth are usually due to inability to maintain the furcal area free of plaque either by the patient or by the lack of access to the clinician.³ Park et al conducted a study on Factors Influencing the Outcome of Root-Resection Therapy in Molars and concluded that root resection to treat periodontal problems had a better prognosis than for non-periodontal problems. To achieve a good result, it was important that the remaining roots had >50% bone support. This guideline may help to improve the predictability of root-resection therapy.

FAILURES ASSOCIATED WITH PERIODONTAL FLAP SURGERY

Failures of periodontal flap surgery can be due to i) Improper incision ii) Reflection of the flap iii) Debridement of the root surfaces and the bone iv) Suturing of the separated flaps should be done by adapting the flap closely to the tooth margins. Failure of proper placement of the sutures will lead to gaping of the wound and thereby results in disease recurrence.¹² Johnson et al conducted a study on The impact of cigarette smoking on periodontal disease and treatment and summarized that smokers benefit from nonsurgical and surgical forms of periodontal therapy.

FAILURES ASSOCIATED WITH SOFT TISSUE AUGMENTATION SURGERY

Failures associated with soft tissue autografts are i) Mismatch between graft size and defect ii) Improper graft adaptation to the underlying periosteum. iii) To permit adequate transfusion of the graft, it has been recommended that all fat and glandular tissue should be removed prior to suturing in order to prevent possible necrosis and/or inadequate take. iv) Graft movement as a result of inadequate or insufficient suturing will surely result in failure because no plasmatic diffusion will occur. v) The final failure is often seen only after the graft has healed.^{2,14} Griffin et al did a study on Postoperative Complications Following Gingival Augmentation Procedures and concluded that long surgical procedures and smoking may increase the severity and frequency of certain post-surgical complications after gingival augmentation procedures.

FAILURES ASSOCIATED WITH ROOT COVERAGE PROCEDURES

According to Langer and Langer¹⁵ in 1992 common failures associated with root coverage procedures are i) Recipient bed is too small to provide adequate blood supply, ii) Perforation of the mucosal flap, iii) Inadequate (small) size of the graft, iv) Inadequate coronal positioning of the flap, v) Poor root preparation and/or root conditioning.^{1,15}

DISCUSSION

The goals of periodontal therapy are to preserve the dentition and periodontium, maintain and improve periodontal health, comfort, esthetics and function.¹⁷ All patients should receive a comprehensive periodontal examination.¹⁸ The purpose of the comprehensive periodontal examination is to determine the periodontal diagnosis, prognosis and treatment plan. This process includes an evaluation of

periodontal and tissues to determine the suitability of the patient for treatments including non-surgical, surgical, regenerative and reconstructive therapy.¹⁸

The clinical findings together with a diagnosis and prognosis should be used to develop a logical plan of treatment in order to eliminate or alleviate the signs and symptoms of periodontal diseases and thereby arrest or slow further disease progression.

The treatment plan should be used to establish the sequence and methods of providing appropriate periodontal treatment. The plan should include:¹⁷ 1) Medical consultation or referral for treatment when appropriate. 2) Periodontal procedures to be performed. 3) Consideration of adjunctive restorative, prosthetic, orthodontic and/or endodontic consultation or treatment. 4) Provision for re-evaluation during and after periodontal or dental implant therapy. 5) Consideration of chemotherapeutic agents for adjunctive treatment. 6) Consideration of diagnostic testing like microbiological, genetic or biochemical assessment or monitoring during the course of the therapy. 7) Periodontal maintenance program.

The results of periodontal treatment will adversely affected by circumstances beyond the control of the dentist. Examples of such circumstances include certain systemic diseases; inadequate plaque control by the patient; undeterminable etiologic factors in which current therapy has not controlled; pulpal-periodontal problems; inability or failure of the patient to follow the suggested treatment or maintenance program; adverse health factors such as smoking, stress, and occlusal dysfunction; and uncorrectable anatomic, structural, or iatrogenic factors.¹⁷

CONCLUSION

Therapeutic failure appears to be more frequent in periodontology than in other fields of dentistry. Such failure may be caused by errors in patient selection, incomplete diagnostic procedures, diagnostic or prognostic errors, treatment difficulties and obstacles, non-controlled healing, or the absence of maintenance therapy. Most failures can be avoided by instituting a regular recall system.¹

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