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ABSTRACT

Periodontal treatment failures seem to arise relatively frequently, possibly because, among other reasons, the periodontist works in a field characterized by the presence of plaque, and the marginal periodontium remains more or less exposed to microorganisms—depending on the intensity and quality of oral hygiene — even after successful primary care. Studies have shown that modern periodontal therapies are effective in maintaining a healthy natural dentition as well as controlling periodontal disease. Numerous treatment strategies and various techniques have been designed & described to treat periodontal disease. Most of these procedures had drawbacks which were identified, leading to the modifications of the original techniques which lead to better treatment options, but still very less emphasis has been laid on failures. Without a regular program of clinical re-evaluation, plaque control, oral hygiene instructions, and reassessment of biomechanical factors the benefits of treatment are often lost and inflammatory disease in the form of recurrent periodontitis may result. So, this review describes the most common failures noticed in periodontal therapies and also discusses the possible solutions to reduce the incidence of failures in periodontal therapy.

KEYWORDS: Periodontal therapy, risk factors, failures.

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INTRODUCTION:

Since then, numerous treatment strategies and various techniques have been designed & described to treat periodontal diseases. All these therapies ranging from scaling & root planing (SRP) to various flap surgeries have their own advantages & limitations. These procedures had failures which were identified leading to the modifications of the various techniques which lead to better treatment options, but very less emphasis has been laid on failures. So, this review describes most common failures noticed in various periodontal therapies and also discusses the possible solutions to reduce the incidence of failures in periodontal therapies. To discuss treatment failures, the concept of successful periodontal therapy must be defined first. In the past, treatment was only considered successful when there was radical elimination of pockets; today the concept of successful treatment has been defined more modestly with clinical parameters like absence of bleeding on probing, reduction in probing pocket depth, gain in clinical attachment level (CAL) and/or reduction in tooth mobility¹. After completion of comprehensive periodontal therapy, persistence of residual periodontal pockets, presence of bleeding and/or pus on probing, increase in loss of attachment or persistence of tooth mobility would be criterias to categorize a periodontal case as failure².

The causes for failure are manifold. 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

- Pre Therapeutic
- Therapeutic
- Post Therapeutic

PRE THERAPEUTIC

Improper Clinical diagnosis: The seriousness of the disease must be established exactly through the diagnostic procedures, not only for entire dentition, but also for each tooth individually and for each side of a tooth. Only the most careful probing of each tooth side, analysis of radiographs, and determination of tooth mobility will reveal the severity of the disease, which requires a correspondingly extensive treatment³.

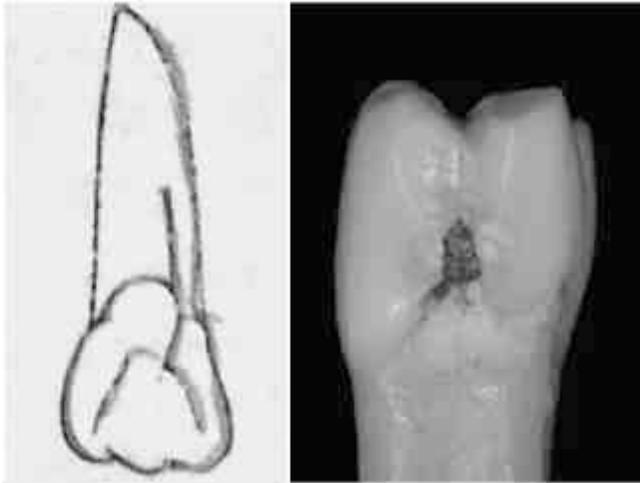
Morphology and restorative phase: Occasionally small resorptive regions (lacunae) are present on the root surface. These may be up to 80 µm deep and cannot be reached by curettes or other instruments, whether used in closed or open debridement procedures. Microorganisms that promote recurrences remain in these niches. Occasionally teeth have fused roots that often run together in a deep groove. Such grooves act as a "guide plane" for bacteria. They are largely inaccessible to curettes. It

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may be possible to open the grooves slightly and to polish them with diamonds in an open procedure during the early stages of periodontitis, but failures are frequent in teeth with such unfavourable macro morphology.



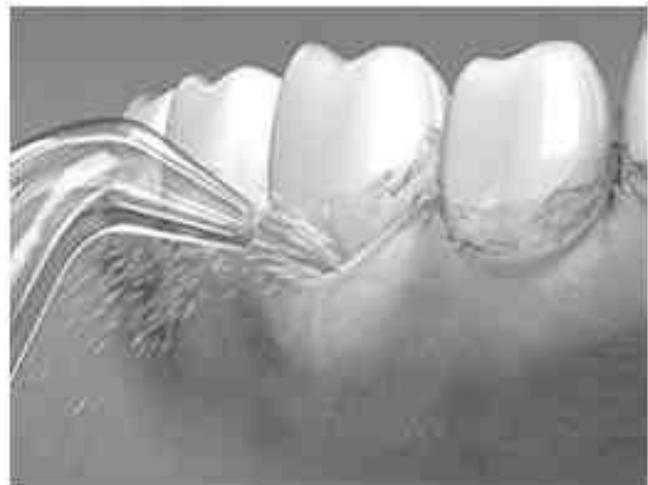
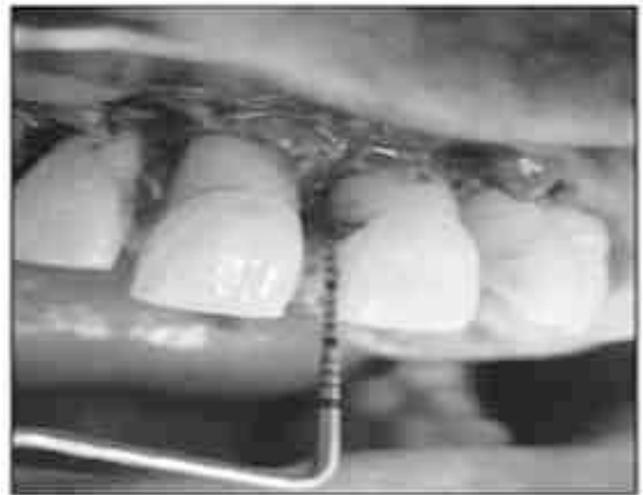
The matter becomes even more complicated in the molar region. Cleaning the roots when open furcations exist is particularly difficult. The variety in macro morphology of these teeth is shown in. As a rule, furcations must be treated with open debridement procedures despite treatment, these sites remain as minor sites of resistance that can lead to failure. Only hemisection and apicoectomy of such teeth may lead to success.

THERAPEUTIC

Non-Surgical: Primary objective of SRP is to restore gingival health by completely removing elements that provoke inflammation (i.e. plaque, calculus, & necrotic cementum and endotoxin embedded on the root surface). Failures associated with SRP include:

1) Persistence of inflammation because of residual embedded calculus which in turn can be due to a wide variety of reasons, such as, inadequate accessibility & visibility seen in deep pockets & in complex anatomical areas of the tooth like the furcation areas, grooves & concavities present on the root surface. 2) Condition of the instruments: dull instruments frequently cause burnishing of the calculus instead of removing it in totality. So, regular sharpening of instruments is advised as it will improve both patient comfort/acceptance and operator performance. 3) Faulty techniques of instrumentation: decreased angulation ($<45^\circ$ to the long axis of the root surface) can lead to burnishing

of the calculus & prevent it from being removed in total. Increased angulation ($>90^\circ$ to the long axis of the root surface) can lead to laceration and trauma to the gingival tissues. Abscess formation can also be noticed in situations wherein residual calculus is embedded in the tissues. Mechanical therapy which follows the principles of periodontal instrumentation will result in reduction in failures in periodontal therapy².

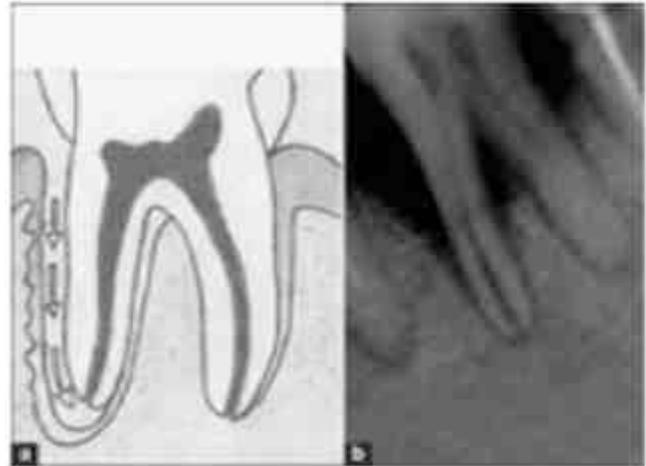
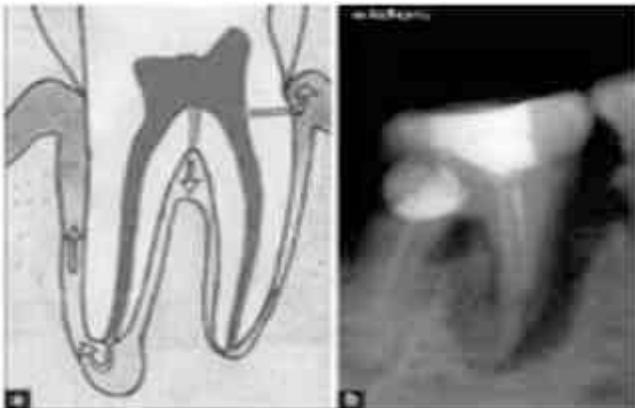


Oral irrigation is defined as targeted delivery of water or irrigant to a specific location (periodontal pocket) within the mouth. These clean the non-adherent bacteria and debris from the oral cavity. Failures associated with these procedures are due to i) Persistence of inflammation as the irrigant solution cannot be penetrated into deeper pockets. ii) The drug present in the irrigant gets thrown out of the gingival sulcus/periodontal pocket by the constantly oozing crevicular fluid (which is known as “wash-out effect”). iii) So, apart from the fact that, irrigation cannot be employed as a solo

therapy, it is weakly effective even as adjunctive therapy⁹.

Surgical: Failures of periodontal flap surgery can be due to i) Improper incision: the rationale of any periodontal flap surgery is to gain access to underlying root and bone surfaces. If incisions are not made upto the bone/root surface a mucosal flap is elevated which, hinders in gaining proper access to the underlying root surfaces. It can also cause increased amount of bone resorption. Therefore while giving incision the blade should hit the bone in order to elevate a full thickness flap. ii) Reflection of the flap: elevation of the periodontal flap should be such that only around 1 mm of marginal bone is exposed. Over reflection will result in bone resorption, whereas under reflection will result in limited access to the underlying root/bone surface. iii) Debridement of the root surfaces and the bone: complete debridement with removal of plaque and calculus from the root surface is essential for success of any periodontal flap surgery. iv) Suturing of the separated flaps should be done to closely adapt the flap to the tooth margins. Failure to properly place the sutures will lead to gaping of the wound and hence recurrence of the disease¹²

- **Endo – Perio:** Multirooted teeth offer unique & challenging problems for the periodontist. The furcation area, because of the interrelationships between the size & shape of the teeth, the roots & their alveolar housing, & the varied nature & pattern of periodontal destruction, creates situations in which routine periodontal procedures are somewhat limited & special procedures are generally required.⁸ 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 clinician⁸.



- **Ortho – Perio:** Frenectomy procedures may fail due to i) Reattachment of the frenum as a result of improper incision design, & failure to sever the underlying periosteal attachment, therefore 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 leading to hindrance in healing. 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 glue¹⁰.





- **Prostho – Perio:** Failures associated with this procedure are primarily due to i) Inflammation of the gingiva due to violation of the biological width (defined as the combined physiologic dimension of the junctional epithelium & the supracrestal connective tissue attachment which is approximately 2mm. 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) In cases of surgical crown lengthening, excessive removal of the bone 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 tooth¹¹.

Soft tissue surgery: It is most widely used and predictable technique for increasing the width of the attached gingiva. Common failures associated with soft tissue autografts are²

- **Mismatch between graft size and defect:** if the denuded root defect is small enough, the collateral circulation will be adequate to support bridging. On the other hand, when prominent roots, with relatively wide areas of root exposure are grafted, two – point collateral circulation is insufficient for the graft support. As a result, the center of the graft thins and becomes necrotic; the graft splits and ultimately fails.

- Improper graft adaptation to the underlying periosteum. After suturing, slight pressure is applied to the soft tissue graft with gauze moistened in saline for 5 minutes to permit fibrin clot formation and prevent bleeding. Bleeding will result in hematoma under the graft with subsequent necrosis.
- To permit adequate transfusion of the graft, it has been recommended that all fat and glandular tissue be removed prior to suturing to prevent possible necrosis and/or inadequate take. Even though the need for this has been questioned, it is still generally accepted procedure.
- Graft movement as a result of inadequate or insufficient suturing will surely result in failure because no plasmatic diffusion will occur.
- The final failure is often seen only after the graft has healed. The clinical appearance is acceptable, but the graft is totally movable when probed. This is a failure of technique and results from not removing all loose connective tissue and muscle fibres from the periosteal bed prior to the placement and not making sure that the bed is firmly attached to the underlying bone¹⁴.

POSTTHERAPEUTIC

Unsupervised healing and absence of maintenance therapy: Many failures arising soon after completion of treatment can be traced to the absence of supervision of the healing process. Maintenance therapy or supportive periodontal therapy is decisive for long term success and prevents recurrence of the disease⁵. Without regular recall examinations of the patients which are tailored according to the needs of the individual case, recurrence of periodontal disease will occur over a period of time. The frequency of recall is based on variety of factors such as primary diagnosis, presence of systemic conditions (e.g.diabetes), presence of risk factors (e.g.smoking), success of primary treatment following a period of supervised healing and the extent to which, the patients can be motivated to cooperate^{6,7}. Depending on the needs of the individual case, recall visits can be between 2 months to one year.

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.

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