Review Article

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INTERDISCIPLINARY APPROACH TO RESTORATIVE DENTISTRY

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ABSTRACT:

Recently, dentistry has moved into an era of specialization and an interdisciplinary approach for any clinical condition for which specialist skills are required. At present, this kind of practice is desired not only by patients but also by dentists who want to ensure optimal treatment results. Patients are well aware of the strides that dentistry has been making in the recent times and aesthetics has now come to play a vital role in bringing about a desirable outcome. The formerly independent disciplines of orthodontics, periodontics, restorative dentistry and maxillofacial surgery often must join forces to satisfy the public's desire to look better. The multidisciplinary approach permits the utilization of knowledge and skills of specialties to formulate a comprehensive therapy that delivers optimal patient care.

Keywords: interdisciplinary dentistry, multidisciplinary approach, esthetic dentistry, multidisciplinary management

INTRODUCTION:

Multidisciplinary approach has become an integral part of everyday dentistry. Interdisciplinary dentistry may either be interpreted in a very narrow sense as the actual fusion of specialties, or in a wider sense as a multidisciplinary phenomenon in which independent specialties work jointly to resolve a problem, each from its own conceptual viewpoint.

Interdisciplinary dentistry should be given priority as early as possible because of the prime importance of diagnosis. Interdisciplinary dentistry focuses on interaction, not only between the primary dentist and the specialists, but also between the interdisciplinary team and the patient. The ultimate goal is to create and perpetuate an ideal treatment environment in which the patient feels comfortable and doctors can work effectively.

PERIODONTICS-RESTORATIVE DENTISTRY INTER-RELATIONSHIP

Active periodontal disease must be treated and controlled prior to any

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restorative dentistry. Restorative dentistry must be performed on a periodontium free of inflammation and pockets, without any mucogingival involvement, and with the contour and shape of the periodontium corrected for a good functional and esthetic restorative result.

Restorative clinicians must understand the role of biologic width in preserving healthy gingival tissues and controlling the gingival form around restorations. One must also apply this information in the positioning of restoration margins, especially in the esthetic zone where a primary treatment goal is to mask the junction of the margin with the tooth.

A clinician is presented with three options for margin placement: supragingival, equigingival (even with the tissue), and subgingival locations. [1] From a periodontal viewpoint, both supragingival and equigingival margins are well tolerated. The greatest biologic risk occurs when placing subgingival margins. [2] These margins are not as accessible as supragingival or equigingival margins for finishing procedures, and in addition, if the margin is placed too far below the gingival tissue crest, it violates the gingival attachment apparatus.

When determining where to place restorative margins relative to the periodontal attachment, it is recommended that the patient's existing sulcus depth be used as a guideline in assessing the biologic width requirement for that patient [Figure 1]. The base of the sulcus can be viewed as the top of the attachment, and therefore variations in attachment height are accounted for by assuring that the margin is placed in the sulcus and not in the attachment. [3,4]

Restoration contour has been described as extremely important to the maintenance of periodontal health.[5] Ideal contour provides access for hygiene and has the fullness to create the desired gingival form and a pleasing visual tooth contour in esthetic areas. Evidence from human and animal studies clearly demonstrates a relationship between overcontouring and gingival inflammation; however, at the same time, undercontouring produces no adverse periodontal effect.[6] [Figure 2]

ORTHODONTICS-RESTORATIVE DENTISTRY INTER-RELATIONSHIP

Occasionally, patients require restorative treatment during or after orthodontic therapy. Patients with worn or abraded teeth, peg-shaped lateral incisors, fractured teeth, multiple edentulous spaces, or other restorative needs may require tooth positioning that is slightly different from a nonrestored, nonabraded, completely dentulous adolescent. With proper planning, orthodontic treatment can create ideal anatomic space for the planned restorations, for example, when establishing slight mesial and distal spacing for anatomic restoration of a peg lateral incisor. Slightly more distal space

should be established to accommodate the more convex distal line angle relative to the straighter mesial line angle of a lateral incisor.

A common orthodontic-restorative problem is peg-shaped, or malformed maxillary lateral incisors. In some patients, the best choice for treating a peg-shaped lateral incisor is to restore the malformed tooth to its correct dimension. [7] If sufficient space exists, a composite restoration may be placed before orthodontic treatment. However, in most situations, there is insufficient space to restore the malformed lateral incisors.

Where should the lateral incisor be positioned buccolingually: toward the labial, in the center of the ridge, or toward the lingual? The answer to this question depends on the type of permanent restoration that will eventually be constructed for the tooth. In most cases, during orthodontic treatment, a temporary composite build-up is placed on a peg-shaped lateral incisor. However, eventually, this tooth may be restored with either a porcelain laminate or a porcelain crown. If the eventual restoration will be a porcelain crown, the lateral incisor should be positioned in the center of the ridge buccolingually, leaving 0.30 to 0.75 mm of overjet. This will avoid additional tooth preparation on the lingual of the lateral and permit space for gold and/or porcelain in the final restoration. However, if the final restoration will be a porcelain veneer, then the peg-shaped lateral should be positioned lingually to contact the mandibular incisors in centric occlusion. This will allow sufficient space on the labial to construct both the temporary composite build-up and the eventual porcelain laminate.

Finally, where should the lateral incisor be positioned incisogingivally? This relationship is determined by the position of the gingival margin. Most peg-shaped lateral incisors are not only narrower mesiodistally and buccolingually, they are also shorter than normal lateral incisors incisogingivally. If the incisal edge is aligned with the opposite lateral incisor, the crown may be too short. Therefore, the gingival margins of the peg-shaped lateral should be aligned with the contralateral lateral incisor. The restorative dentist will restore proper length, width, and thickness of the tooth when the temporary composite build-up and final restoration are constructed.

In some situations, a peg-shaped lateral incisor may be restored before orthodontic treatment. However, this may only be accomplished if sufficient space exists between the lateral incisor and adjacent canine and central, but this rarely occurs. Therefore, in most situations, the orthodontist and restorative dentist must work closely to manage the restoration of the peg-shaped lateral during orthodontic treatment. Because the orthodontist will be creating extra space, it is advantageous to place the restoration during orthodontic treatment. The

patient should visit the orthodontist's office first, to remove the bracket and residual cement. The restorative dentist can then bond a composite restoration to the lateral incisor to create normal crown shape and size. A bracket is replaced on the tooth to permit completion of the orthodontic treatment and then the orthodontist may close any extra space and create more ideal tooth position.

Any treatment modality for the crowded dentition should be designed to achieve form and function with minimal invasive dentistry. Restorative space management (RSM), is the alternative, or adjunctive. In selected cases, RSM can be used to provide an esthetic outcome by strategic removal of tooth structure and the addition, either directly or indirectly, of composite and ceramic materials. The benefits of RSM include not only the apparent correction of tooth position but also real improvement in shape, size, discoloration removal, caries elimination, and replacement of defective restorations. The result is improved appearance and improved intraoral health.

PROSTHODONTICS-RESTORATIVE DENTISTRY INTER-RELATIONSHIP

Crowns and fixed partial dentures are definitive restorations. They are time-consuming and expensive treatment options and should not be recommended unless an extended lifetime of the restoration is anticipated. A foundation restoration, or core, is used to build a damaged tooth to ideal anatomic form before it is prepared for a crown. With extensive treatment plans, the foundation may have to serve for an extended time. It should provide the patient with adequate function and should be contoured and finished to facilitate oral hygiene.

If the tooth to be restored with a cemented restoration is in a highly visible area, or if the patient is highly critical, the cosmetic effect of the restoration must be considered. Sometimes a partial veneer restoration will serve this function. Where full veneer coverage is required in such an area, the use of ceramic in some form is indicated. Metal-ceramic crowns can be used for single-unit anterior or posterior crowns, as well as for fixed partial dentures. All-ceramic crowns are most commonly used on incisors, although they can be used on posterior teeth when an adequate bulk of tooth structure has been removed and the patient is willing to accept the possibility of more frequent replacement.

Teeth require preparation to receive restorations, and these preparations must be based on fundamental principles from which basic criteria can be developed to help predict the success of prosthodontic treatment. Careful attention to every detail is imperative during tooth preparation. A good preparation will ensure that subsequent techniques (e.g., provisionalization,

impression making, pouring of dies and casts, waxing) can be accomplished.

The junction between a cemented restoration and the tooth is always a potential site for recurrent caries because of dissolution of the luting agent and inherent roughness. The more accurately the restoration is adapted to the tooth, the lesser the chance of recurrent caries or periodontal disease.[8] A well-designed preparation has a smooth and even margin. Rough, irregular, or "stepped" junctions greatly increase the length of the margin and substantially reduce the adaptation of the restoration [Figure 3].

ORAL SURGERY - RESTORATIVE DENTISTRY INTER-RELATIONSHIP

Traumatic fractures of the anterior teeth are a common form of dental trauma. It most commonly involves the maxillary central incisors due to its position in the arch. Fracture of the anterior teeth due to trauma requires immediate attention not only to restore immediate function and esthetics but also because of the psychological impact it has on the patient. The treatment options offered to the patient in such a situation can vary from a simple composite build up to complex restorative intervention depending on the severity of the fracture and its extent. [9]

One of the options for restoration of fractured anterior tooth is rebonding of the fractured fragment. Rebonding of the fractured fragment should be considered only in cases where there is no or minimal violation of biological width and the fragment is retrieved in a relatively intact condition. [10]

The treatment options for anterior tooth trauma can range from direct resin based composite restoration, tooth fragment rebonding, ceramic veneer, root canal treatment and tooth fragment rebonding, crown, root canal treatment and crown with or without post and core and extraction followed by replacement.

A fiber post can also be extended into the pulp space of the coronal fragment for auxiliary retention. Fiber post is preferred over a metallic post because they have better esthetics, their modulus of elasticity is similar to that of root dentine. This results in less stress concentration on the root and thus low incidence of root fracture. [11]

CONCLUSION:

As the art and science of dentistry advances, there are more tools than ever to treat our patients. Using a multidisciplinary approach, the practitioner can provide the best possible care with minimally invasive dentistry that will ensure the longevity of the restorations and their continued function. Teamwork is the mainstay of interdisciplinary dentistry, as it bridges the inevitable gaps that exist between different disciplines of dentistry.

We live in a world where survival depends on mutual interdependence and symbiotic interaction. And the world as we know it is changing. Change is the

only constant. We have to prepare ourselves and future generations of dentists for change.

Team work is today's mantra. The process of learning has no end. If this process is founded on sound basics and purposeful research and translated into holistic, multidisciplinary treatment based on the proper ethics, success is guaranteed.

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FIGURES:

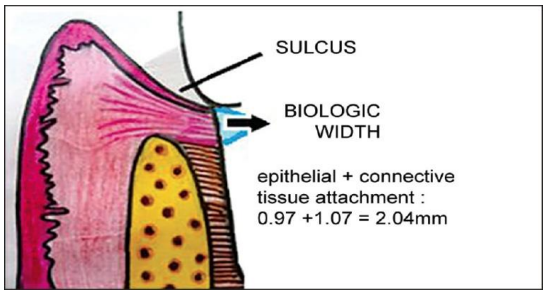

Figure 1: Biologic width

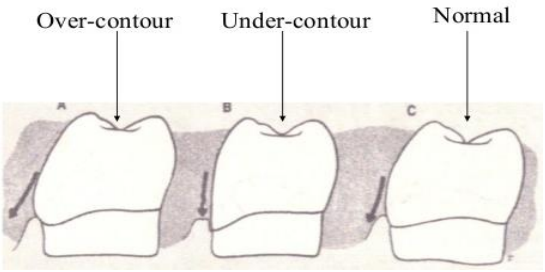

Figure 2: Restoration contour

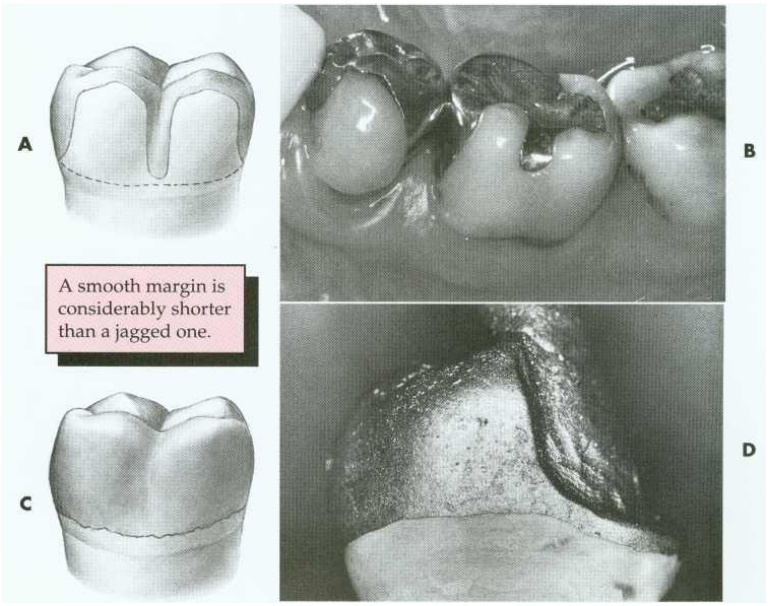

Figure 3: A and B, Poor preparation design, leading to increased margin length. C, A rough, irregular margin will make the fabrication of an accurately fitted restoration almost impossible. D, An accurately fitting margin is possible only if it is prepared smoothly.