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PREFACE

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Chapter 1

THE ROLE OF MESENCHYMAL STEM CELLS DERIVED FROM TEETH AND TEETH SURROUNDING TISSUES IN BONE REMODELING

Sinan Yasin ERTEM[1]

INTRODUCTION

In recent years, stem cell and tissue engineering applications have gained importance for regeneration and repair of body structures in medicine. This concept, which can also be called regenerative medicine, is thought to take its place in clinical applications in the future. Their ability to transform into various cell types indicate that stem cells will play an important role in treatments in the future.[1] Stem cells, which have not yet been differentiated, are cells that can regenerate themselves in a living being's body for a very long time and can be differentiated into at least two different types of cells. These two features are necessary for a cell to be called a stem cell. Progenitor (precursor) cells have been identified in the postnatal tissues of humans. Having a limited lifetime, these cells are separated from stem cells which exist throughout the life of an organism. Progenitor cells also generate only certain tissue types and have a limited differentiation capacity.[2,3]

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a new option in reconstructive surgery, but there is no reliable evidence as to which of the bone regeneration methods is the most effective and has the most predictable outcomes. When the current studies on MSCs are examined, we observe that the sample sizes are generally very small and the follow-up times are short. Many studies have shown that MSCs can clinically form a new bone. However, we think that larger, well-designed randomized controlled trials with longer follow-ups are needed to demonstrate whether MSCs will play an important role in reconstructive surgery in the future. The application of mesenchymal stem cells has promising results, but for now, autogenous bone should be considered as the first-choice graft material.

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Chapter 2

OCCLUSION AND ANALYSIS METHODS IN DENTISTRY

Tahir KARAMAN[1]

INTRODUCTION

Occlusion, which has a very important place in dentistry, is expressed as the contact between the occlusal surface of the maxillary and mandibular teeth. In addition, if the concept of occlusion is defined in another way, it can be explained as the contact positions of the maxillary and mandibular teeth occurring during closure [(1,3)]. The term articulation is the contact of the maxillary and mandibular teeth in the protrusive and lateral movements of the mandibula. The mutual static relations of the teeth are related to occlusion and the dynamic relations to articulation [(4)]. The contact of the teeth, jaw movements, and biological and functional properties of natural teeth affect the occlusion. An occlusion that is compatible with the stomatognathic system, in which the chewing function is performed effectively and a good aesthetic is provided, is defined as ideal [(3,5)]. In order to make the concept of occlusion more understandable, the basic terms must be well known.

Centric Occlusion (Intercuspal Position): The position of the maxillary and mandibular teeth that exhibits comfortable closing and contact. This occlusion is expressed as the interocclusal dental position of the teeth relative to the mandibular teeth

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Chapter 3

SALIVA: AS A DIAGNOSTIC TOOL

Sibel EZBERCİ[1]

Human saliva is a mixed fluid composed of a complex mixture of secretory products from the salivary glands and other substances coming from oropharynx, upper airway, gingival crevicular fluid, food deposits, bacteria and bacterial products, viruses and fungi, desquamated epithelial cells, other cellular components and blood-derived compounds with many biological functions essential for the maintenance of oral health.[1,2,3]

Saliva is secreted from three pairs of major salivary glands; the parotid, submandibular and sublingual and from hundreds of minor glands located in the submucosal oral tissues and some gingival crevicular fluid.[4] The consistence of secretions varies depend on the gland. The parotid is the largest salivary gland and its serous secretion has higher amylase and proline-rich proteins (PRP) and no mucin.[5] Other two major glands and minor glands secretions are more viscous because of the glycoproteins. While the submandibular gland secretes a mixture of serous and mucous fluids, the smallest of paired major glands ;sublingual is a mucous gland. Minor salivary glands; the buccal and labial glands are both mucous and serous; the palatal and palatoglossal are mucous and the lingual glands are mucous besides von Ebner.[4]

The submandibular gland produces the largest volume of saliva as 65% and it's followed by parotid. The part of 5% is secreted from sublingual glands and the remaining from minor glands.[6]

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Chapter 4

SMILINGS KIDS WITH EARLY FIRST DENTAL VISIT

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INTRODUCTION

First dental visit is the important milestone in the young children's life and essential part of the children's general health care. The goals of the child's first dental visit are conceived as being diagnostic, preventive, therapeutic and behavioral. [1,2] These visits enable dental professionals to assess dental and craniofacial development to determine whether teeth are erupting properly, detect early childhood caries (ECC), guide parent proper oral hygiene for the child and preventive behaviors', provide dietary counselling, give information management of traumatic dental injuries. Early dental education may improve the parent's self-efficacy in managing the oral health of their children. [3,4]

The child's first dental visit has a significant impact on shaping a positive attitude and tolerance towards further treatments and helps to develop trust in the dentist. If the dentist–patient relationship develops positively, this can have a positive effect on patient satisfaction, compliance and use of oral health care services, even leading to improved home care and oral health. [5,6]

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Chapter 5

CURRENT APPROACHES FOR ENDODONTIC TREATED TEETH RESTORATIONS

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THE ROLE OF FINAL RESTORATIONS IN ENDODONTIC TREATMENT SUCCESS

For clinical success, restorations after endodontic treatment are just as crucial as the endodontic treatment processes. Many studies have demonstrated a direct correlation between the quality of restoration and the clinical success of the endodontic treatment[1]. In the past, teeth that had suffered excessive substance loss due to caries and trauma were considered untreatable and needed to be removed[1]. However, this has changed with the rapid development of adhesive techniques and materials[2].

Endodontically treated (ET) teeth are more prone to failure under stress than vital teeth due to the following risk factors[3]:

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post. In contrast, metallic posts are harder than dentin and can endure more occlusal forces than fiber posts; however, their stiffness can create more stress, which can cause root fractures[68,69]. In Yıkılgan ve Bala et al. (2013)'s review, it was recommended to use fiber posts in conservative restorations of ET teeth[2].

CONCLUSION

After root canal treatment, the tooth should be restored permanently as soon as possible. Crowns are not always needed on many ET posterior teeth to increase long-term success because their structural integrity is often compromised. It has been revealed that they can be restored satisfactorily by restorative procedures such as direct RBC, inlay, onlay, and endocrown instead of full crowns.

However, there is an undeniable necessity for studies involving long-term clinical results about the success of these more conservatıve approaches.

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Chapter 6

CURRENT TRENDS IN RESTORATIVE DENTISTRY: LAMINATE VENEERS

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INTRODUCTION

Advances in adhesive dentistry have contributed to the development of minimally invasive methods that cause less tissue loss compared to conventional prosthetic restorations, and one of these applications is laminate veneer restorations. Laminate veneer restorations can be prepared in a conservative way or in some cases without preparation to restore esthetics and function on the labial surfaces of the teeth[1]. Provided that the correct indication is given and the protocols are followed precisely; the restorations performed are very successful clinically.

Indications of Laminate Veneers

- Treatment of discolorations: Tetracycline discoloration, fluorosis stains, white spot lesions, discolored non-vital teeth, etc.
- Correction of minor malpositions: Slightly rotated or lingualized teeth can be corrected, especially if the patient does not want orthodontic treatment.

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CONCLUSION

Because of their esthetic appearance, their durability and biocompatibility, porcelain laminate veneers have become a standard procedure. However, with the development in composite materials, composite laminate veneers have also become a treatment alternative. Indirect composite restorations are cost-effective, have higher flexural modulus and cause less abrasion to the antagonistic teeth than porcelain. Direct composite laminate veneers are usually inexpensive, easy to repair and they can satisfy patients with their acceptable esthetic results. Clinical studies showed limited longevity due to direct composite laminate veneers' susceptibility to wear, discoloration and fractures. Yet, direct composite laminate veneers have shown promising results in current studies.

There are shortcomings in the literature on long-term follow-up studies of composite laminate veneers. With the advances in adhesive dentistry and composite materials, further studies are required to define mechanical properties and survival of direct and indirect laminate veneers and to compare techniques.

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Chapter 7

A GENERAL LOOK THROUGH BULK-FILL RESIN-BASED COMPOSITES

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INTRODUCTION TO BULK-FILL RESIN-BASED COMPOSITES

For many dentists, the increased esthetic demands of the patients and the advancement of clinically successful adhesive system technology have put a spotlight on the resin composite materials to measure up to being the material of choice for posterior restorations.

In general, dental composites encompass four main components: (1) the organic polymer matrix; (2) fillers consisting inorganic particles (e.g. glass, fused silica, silica-zirconia, pre-polymerized composite particles); (3) the coupling agent that chemically bonds the reinforcing filler surface to the resin; (4) the initiator-accelerator system(1). To ensure complete polymerization of the resin-based composite (RBC) and reduce the polymerization stress, RBC materials have to be light-cured in increments(2).

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ly inexperienced clinician may have difficulty in manipulating a low viscosity bulk-fill material. This situation will be the primary concern, especially when restoring a wide buccolingual proximal cavity. The process of applying bulk-fill RBC requires attention from the operator because the bulk-fill layer must not exceed the maximum depth of cure limit to achieve effective polymerization. At the same time, the operator should leave a sufficient space (approximately 1 mm) for the capping layer, which affects the final esthetics of the restoration. Another issue is the fact that even if a capping layer is placed on the occlusal surface, there is only flowable bulk-fill RBC in the proximal walls of a class II restoration. Thereupon, there may be a risk of long term loss of proximal contact due to material wear and degradation. Within the limits of our knowledge, there is one product (EverX Posterior) whose manufacturers specifically instruct to place a conventional RBC in the proximal walls.

Future clinical trials and *in vitro* studies focusing on the characteristics of the materials at various clinical conditions should be carried out for the dentists to alter from traditional incremental technique to bulk filling.

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Chapter 8

ADVANCED IMAGING METHODS IN DENTISTRY

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Radiography is one of the most valuable diagnostic methods used in dentistry and plays an significant appliance in the diagnosis and treatment planning of diseases.(1) The devices used in dentistry have shown a great improvement in technology. In the late 1940s, Y.V. Panoramic radiography device was introduced by Paetero. In the 1980s, digital methods entered the field of dentistry. The first digital imaging system RVG (Trophy Radiologie, Vincennes, France) Invented by Frances Mouyens in 1984. Digital methods have become more popular in recent years.(2, 3) Digital radiography is a imaging method that enables to obtain a radiographic image with the help of a sensor, to separate this image into electronic parts, to display and store it on a computer. This way, image storage is easy and there is no archiving

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Chapter 9

THE IMPACT OF GROWTH FACTORS IN PERIODONTAL REGENERATION

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INTRODUCTION

The purpose of periodontal treatment is to provide patients with a dentition that functions healthy and comfortable throughout their lives. This is often accomplished using resective processing. However, resective therapy often results in reduced soft and hard tissue support.

Ideally, periodontal therapy should eliminate inflammation, stop disease progression, maintain aesthetics, maximize patient comfort, and regenerate lost periodontal tissue support. The main goal of regenerative periodontal therapy is to repair the supporting tissues of the tooth, which was lost as a result of periodontal disease. In other words, it is the formation of new cement, new bone, new periodontal ligament.

During the development or regeneration of any tissue, there are cell interactions, local and / or systemic effective growth factors (hormones), and interaction of extracellular matrix components. [1,2] The key factor in determining regenerative treatment methods and effectiveness is to understand the cellular and molecular events necessary for the regeneration of periodontal tissues. Therefore, it has been argued that it is important to understand the effective mechanisms in the process of tissue development in creating the conditions required for regeneration. [3,4,5]

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ine possible roles in tissue regeneration and wound healing. Researches on various carrier systems and combined use of factors to increase the effectiveness of the factors used are important for increasing the effectiveness of these molecules. However, a clear indication of the mechanisms to affect cells and the mechanisms of action during the development period will be very decisive in determining their efficiency of use.

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