EFFECT OF APPLICATION OF TWO DIFFERENT BLEACHING AGENTS ON HUMAN ENAMEL IN VITRO
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OBJECTIVE: This study was done to investigate the effects of application of two different bleaching techniques and agents on enamel hardness, chemical composition, surface morphology, and the extent of changes occurring after bleaching procedure. METHODS: Forty intact human first premolars extracted for orthodontic reasons were used in this split-tooth in vitro study. The specimens were randomly divided into two equal groups and sectioned buccolingually. Half of each crown was treated and the other half served as its control. For Group 1 (G1), an in-office bleaching technique was used. The specimens were treated with UV light activated H₂O₂ 25% (zoom whitening system) according to manufacturer’s instructions. For Group 2 (G2), an at-home bleaching protocol was used with 20% carbamide peroxide 4 hours daily for 14 days. The specimens were stored in artificial saliva at 37° C in a dark environment during the treatment period. The effects of bleaching were evaluated using microhardness test (MHT), energy dispersive x-ray (EDX) analysis, scanning electron microscopy (SEM), and polarized light microscopy (PLM). RESULTS: The present study revealed that bleaching resulted in significant decrease in microhardness of enamel particularly in superficial layers, changes in chemical composition, and alteration in enamel surface morphology such as areas of erosion, loss of outer rodless layer, irregularities, and exposure of enamel rod ends. CONCLUSIONS: 1. The high concentration of bleaching agents could affect intensively enamel hardness particularly in superficial layers; 2. The use of at-home bleaching with 20% CP for long time could demineralize enamel surface; 3. SEM investigation demonstrated erosion of outer aprismatic layer, irregularities, and exposure of enamel prisms ends.

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INFLUENCE OF V-SHAPED PALATAL VAULT ON DENTURE BASE MATERIALS’ CHARACTERISTICS: A FINITE ELEMENT ANALYSIS

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INTRODUCTION: Factors as: shape and depth of the palatal vault, the strength and thickness of denture base material greatly affect the fracture resistance of maxillary denture, thereby, influencing the durability and the rate of denture failure. Hence, the prediction of different base materials behavior is decisive to select the proper one and prevent future denture fracture. OBJECTIVES: In this study the influence of V-shaped palatal vault on denture base materials’ characteristics was studied. METHODS: A finite element model was specially prepared for this study with average denture base thicknesses of 2mm. Three different denture base materials were investigated under 100N vertical and oblique loading. Linear static analysis was performed. RESULTS: Finite element analysis showed very low level of bone Von Mises stress under vertical loading, that means three denture base materials and mucosa distributed the applied load and absorbed its energy perfectly. While, mucosa is negligibly affected by changing denture base material, and showed low/safe levels of stresses. CONCLUSIONS: The V-shaped palatal vault affects denture base materials that; reducing its rigidity will increase the induced stress levels on it. Thus denture base material selection needs a compromise between its flexibility and its life-time. Key words: Finite element analysis, V-shaped palatal vault, Denture base materials.

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DISTRACTION OSTEOGENESIS IN ORAL AND MAXILLOFACIAL SURGERY
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INTRODUCTION: Here we are talking about distraction osteogenesis which, Egypt. Means creation of new formed bone & adjacent soft tissue after gradual & controlled displacement of bone fragment obtained by surgical osteotomy. Codvilla in 1905 was the first to perform extremity lengthening by the application of extremal traction then by Gavril Ilizarov, late in 1980s he published in America for the first time his research and clinical results on the bone distraction. Finally, Mccarthy et al. 1989 were the first to apply extra-oral DO on 4 boys with congenital anomalies such as hemifacial microsomia and Nager’s syndrome. This report ushered in the modern era of clinical craniofacial distraction.

OBJECTIVES: This review aimed to elucidate what is DO as well as its techniques and applications in craniofacial surgery. DO consists of 5 sequential periods: Osteotomy, Latency, Distraction, Consolidation and Remodeling. The used techniques are; Monofocal, Bifocal, Trifocal. Its application in dentistry: Alveolar, Trans-palatal, Transmandibular, Condylar transport, Craniofacial DO & Bilateral sagittal split ramus osteotomy. There are advantages which are Decrease operating time and hospital day & can be applied in younger patient, there are disadvantages like pain during distraction phase and doesn’t correct underlying growth disturbance. Complications of DO: Are divided into Intra-operative, Intra-distraction, Post-distraction. CONCLUSIONS: DO of the craniofacial skeleton has become an alternative to many conventional orthognathic surgical procedures. DO represents a new development in craniofacial surgery with several potential benefits, including less invasive surgery and correction of deformities that improved post treatment.

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RECENT APPLICATIONS OF 3D PRINTING TECHNOLOGY IN TISSUE ENGINEERING
Chaoukat Amer Al Sakati \(^1\) and Omnia Sultan \(^2\)

**INTRODUCTION:** The 3-dimensional (3D) printing is a popular production process through additive layering to produce detailed physical objects from computer-based models. Over the past few years, 3D printing have acquired reputation and specifically speaking in Oral & Maxillofacial surgery. Among different applications in Oral & maxillofacial surgery, Tissue engineering using the 3D printing technology has attracted the attention from most researchers and started to be the new revolution. The high demand for organ and tissue replacement, regeneration and repair is rapidly growing and it is not meeting the high demand due to shortage of donors and biocompatibility issues that will lead to rejection of the transplant immunologically. **OBJECTIVES:** This review is concerned to introduce principles and state of 3D bio printing methods. Discussing current applications for biomedical and tissue engineering fields using 3D printed scaffolds in Oral & Maxillofacial surgery. **CONCLUSIONS:** 3D bio printing could be considered the future technology for many biomedical applications especially in the field of dentistry.

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EFFECT OF PROPOLIS ON PROLIFERATION OF ORAL MUCOSAL TISSUE

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INTRODUCTION: Propolis, a flavonoid-rich product of honey comb, exhibits antibacterial and anti-inflammatory properties. OBJECTIVES: In this study, we aimed to examine the proliferative and regenerative influence of propolis on the gingival tissues in rats using routine H&E stain. METHODS: Thirty adult male albino rats with 120-150 gram body weight were used in this investigation. The animals were divided into 2 groups. The first group was treated with propolis in a daily oral dose, and the second group served as controls, and supplied with a daily oral dose of 1ml distilled water. RESULTS: The histological results showed that the gingiva of the animals that received propolis as a daily oral dose showed nearly the same histological features of surface epithelium of the control group with the four categories of cells with apparent increase in number of cells leading to slight acanthosis, mild increase in granular cell layer and its keratohyaline granules in addition to slight hyperkeratosis. this mild epithelial hyperplasia might be due to decrease in the rate of the physiologic cell death (apoptosis) of keratinocytes under the effect of propolis application. CONCLUSIONS: our results concluded that propolis solution can be beneficial constituent of mouth wash and surgical dressing, increasing not only the viability but also the physiological health of gingival cells.

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TOOTH HEALING ITSELF, ISN’T A DREAM ANYMORE!!
Enjy Elkimary

INTRODUCTION: As tooth decay is the world’s oldest & most widespread disease which is a process of continuous demineralization and remineralization of the tooth structure. An important question we could ask ourselves is: What does the tooth need to heal itself? That was the point of departure towards Glass Carbomer® Allow it thereby to make use of observable and known natural processes such as remineralisation and biofusion through the ion exchange of compatible materials. And if it could also achieve this while avoiding the use of any raw materials that have toxic properties. Well then, this could truly say we were getting somewhere! OBJECTIVES: we are aimed to discuss the invention of a permanent restorative material that would help a tooth heal itself to the point of being a sustainable unit, after preliminary treatment by a dentist and a mix of safe and sustainable building materials that has proven its clinical worth in dental practices for over 10 years. CONCLUSIONS: GCP Glass Fill is 100% biocompatible and safe for the dentist, the patient and the environment which is easier and faster to apply than conventional materials.

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DENTAL AND ORO-FACIAL SPORTS-RELATED TRAUMA AMONG A GROUP OF SAUDI ATHLETES: KNOWLEDGE AND PRACTICES

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OBJECTIVES: To assess the knowledge and practice of a group of Saudi athletes regarding dental and oro-facial sports-related trauma (DOSRT), as well as factors affecting using mouth guards.

METHODS: Male athletes from three clubs in the Eastern Province, Kingdom of Saudi Arabia were included in the study. A self-administered questionnaire was used to collect information about DOSRT including background information, sports practiced by respondents, personal experiences with and correct management of DOSRT in addition to use of mouth guards.

RESULTS: Filled questionnaires were returned by 124 respondents, of whom 71 practiced contact sports. One third of the respondents had previous experience with DOSRT. Most respondents suffered trauma to teeth only (68%), 34% sought a dentist immediately or the next day for help and 39% had consequences because of this trauma. Respondents reported that DOSRT was managed mostly by dentists (37%) or physicians (29%). Mouth guards were used by 34%. Age, sport type, risk of losing teeth during sports and time since practicing sports were significantly associated with using mouth guards (OR= 1.16, 5.56, 7.76 and 0.83 respectively).

CONCLUSIONS: Preventable DOSRT was reported by Saudi athletes. There is a need to increase the awareness of Saudi athletes about using mouth guards in addition to seeking the dentist's help when DOSRT occurs.

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GLENOTEMPORAL OSTEOTOMY VS DAUTEREY’S PROCEDURE IN THE MANAGEMENT OF CHRONIC RECURRENT DISLOCATION OF THE TEMPOROMANDIBULAR JOINT AND HYPER-MOBILE JOINT (WHEN AND HOW?)
Ibrahim zaitoun, Ahmed Medra and Mohamed Aamer

INTRODUCTION: Dislocation of the temporomandibular joint (TMJ) is caused by displacement of the condyle in front of the articular eminence. Many surgical techniques aiming at positioning an obstacles to prevent excessive movement of the condyles. Glenotemporal osteotomy with interpositional bone graft inserted at the osteotomy between the zygomatic arch and the articular eminence will be effective enough to prevent the condyle to dislocate. Another technique is called Dauterey’s procedure is that an oblique cut is made through the zygomatic arch and the arch then sprung down and impacted in under the articular eminence preventing abnormal forward movement of the condyle.

PATIENTS AND METHODS: 30 patients with hypermobile joint, 15 treated with glenotemporal osteotomy and the other 15 treated with Dauterey’s procedure. RESULTS: All the patient had a satisfactory results with different results due to Different age and degree of preoperative dislocation. CONCLUSIONS: Glenotemporal osteotomy and Dauterey’s procedure are effective surgical methods in treatment of chronic recurrent dislocation of the temporomandibular joint.

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INTRODUCTION: The main objective of root canal therapy is the elimination of microorganisms and infected tissue from the tooth root canal system. This is performed by enlarging and shaping the canals to allow for adequate chemical debridement, while at the same time preserving the original shape and structure of the tooth. Conducting root canal therapy (RCT) when uncertain of the canal morphology increases the risk of transportation, ledge formation and even perforation, and often results in failure of the root canal procedure. Proper knowledge of the anatomical configurations of the dental pulp, and the possible variations is critical for successful endodontics. The ideal canal preparation is one in which the original canal morphology is maintained during the preparation procedure, along with the flare taper shape from the coronal to the apical region and thus, preserving the apical foramen. This, however, may not always be possible due to the complexity of the root canal morphology. Preparing curved root canals by maintaining their adequate size and geometries in all directions is a daily challenge for endodontists and general practitioners. OBJECTIVES: That’s why it’s imperative that the clinician should have comprehensive knowledge of the root canal anatomy and the know-how to locate and treat this anatomy. Hence we are aimed to give a mathematical description of root canal forms with the help of differentiated geometrical pattern analysis and computer graphics.

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MANAGEMENT OF LATE ENOPHTHALMOS: IS IT A CORRECTABLE PROBLEM?
Ahmed Medra ¹ and Naglaa Shoukry ²

INTRODUCTION: Enophthalmos is defined as a backward and sometimes downward displacement of the globe within the bony orbit; it is a matter of disproportion between the globe and its confinement. There are different factors that maintain the optimum position of the globe within the orbit. Early correction of this problem is the golden chance to obtain the best results functionally and esthetically; but with the problem of late cases the problem needs more attention.  

PATIENTS AND METHODS: In this study 25 patients' of late posttraumatic enophthalmos were treated by orbital reconstruction in combination with bone grafts, biomaterials, titanium mesh and/or orbital osteotomies if needed, according to each case one or more of these techniques may be used.  

RESULTS: Most of the patients had satisfactory results. Whoever it is evident that a perfect correction of the deformity is difficult to achieve.  

CONCLUSIONS: Late enophthalmos is a multifacorial problem and the loss of harmony between bone and soft tissues in late cases may compromise the results despite perfect bony reduction.

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CONSERVATIVE MANAGEMENT OF OBSTRUCTIVE SLEEP APNEA
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INTRODUCTION: Obstructive sleep apnea (OSA) is a common disorder that affects people of all ages. Affected individuals experience repeated collapse and obstruction of the upper airway during sleep, which results in reduced airflow (hypopnea) or complete airflow cessation (apnea). Although surgical treatment is often effective, conservative treatment remains the standard method in some cases who fail to respond to surgical treatment or refuse it. OBJECTIVES: Conservative management includes positive airway pressure therapy (PAPs), Oral appliances (OAs) and other miscellaneous treatments. Reviewing the different methods of conservative management of obstructive sleep apnea showed that although continuous positive airway pressure (CPAP) is considered the golden treatment for OSA, patients usually prefer OAs due to its ease of use and OAs are proven to decrease the apnea – hypopnea index (AHI) and to treat mild to moderate OSA. CONCLUSIONS: "We concluded that from least invasive and effective to most invasive and effective, treatments can be summarized as follows: All patients should be offered nasal CPAP therapy first. In patients who refuse or reject nasal CPAP therapy, Bi-level pressure machines (BiPAP) therapy should be tried next. If this therapy fails or is rejected, OAs therapy should be considered.

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HAPTICS AND THEIR APPLICATIONS IN MAXILLOFACIAL SURGERY
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INTRODUCTION: What are haptics? Types of haptics? Haptic rendering and how it works? Virtual object representation; 3D visualization and display; Actuation and haptic grippers; Medial image analysis and segmentation. Proving that using haptic devices can minimize the time and effort done by the surgeon in complex trauma and oncology cases. METHODS: Using Virtual Surgery Planning Using HASP (haptical assisted surgery planning) system hardware; 1. Virtual Planning of Bone, Soft-tissue, and Vessels in Oncology Cases; 2. Virtual Planning of Skeletal Reconstruction in Complex Trauma Cases Using Hybrid Haptic actuation (Combining Kinesthetic and Vibrotactile Feedback in Surgery Simulation). RESULTS: An experienced CMF surgeon from the Uppsala University hospital, who had never used HASP before, completed on his own the reconstruction cases in 22 minutes after 45 minutes of assisted training on a different case. After the practice, the surgeons could make a detailed plan of Bone, Soft-tissue, and Vessels in Oncology Cases in between 29 and 63 minutes per case. CONCLUSIONS: We have developed a prototype visuo-haptic system (HASP) for virtual surgery planning, and we describe a surgical bone saw simulator with a hybrid haptic interface that was used in trauma reconstruction and oncology cases, this all contributed greatly in the quality and speed of such surgeries on a large scale.

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THE USE OF VIRTUAL PLANNING IN MAXILLOFACIAL RECONSTRUCTION
Radwa Galal 1, Mayan Saleh 2, Shereen Wagdy 3 and Nader Elbokle 4

INTRODUCTION: This project is mainly concerned with the reconstruction of the mandible after an accident or trauma using a fibula graft & how it was originated then the evolution virtual planning which is a recent accurate method. OBJECTIVES: The purpose of this study is to evaluate the accuracy of computer-assisted mandibular reconstruction with a vascularized fibular flap and compare it with conventional surgery. METHODS: Reconstructions of maxillofacial defects with prefabricated fibulas were performed using a 3D virtual planning. Accuracy of placement of the fibula grafts was compared to preoperative 3D virtual plans by superimposing pre-operative and post-operative CT-scans: We first superimposed the CT-scans on the antagonist jaw, to represent the outcome of occlusion, and then superimposed on the planned fibula segments. Other operations using conventional techniques were applied and the results were compared. RESULTS: Superimposing the CT scans on the antagonist jaws revealed a median deviation of the fibula segments from the planned position. The final position of the fibula graft is determined by the occlusion of the denture, which is designed from the 3D plan. CONCLUSIONS: Mandibular reconstruction using 3D virtual method proved to be more accurate and precise than using the free hand surgery.

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NAVIGATION ON CRANIO-MAXILLO FACIAL SURGERY
Salem Adel ¹, Mohamed Medhat ², Shereen Wagdy ³ and Nader Elbokle ⁴

INTRODUCTION: Surgical navigation is one of the most recent computer planned surgeries. It depends on the same idea of navigation system we have in our cars or mobile phone: “localizer-transmitter-viewer/screen”. Methods: localizer “camera” which like the satellite in space, Surgical probe, which represents the track waves emitted by the GPS unit in the vehicle, and CT scan data set that is analogous to a road map. Early navigation systems, relied on electromagnetic fields, to achieve “satellite tracking” of the surgical instrument, but this technique is affected by metallic instrument used in surgeries. While newer navigation systems use optical instrument-based designs with infrared cameras. OBJECTIVES: we are aimed to explain how navigation could be applied in cranio-maxillofacial surgery. Navigation steps include: Computer planning of the surgery with trial model, Registration of tracing point “reference pints” which will help the operator to register this point to navigation system. These reference points done by application of other fixed fiducial marks or lead emitting diodes or by surgical probe directly on the skin at certain points, Check accuracy of the registration using navigation probe, Start surgery, and Compare your result with the try in done on stereolithiographic model. Application in CMF surgeries: Orbital, Cranial, and maxilla-mandibular reconstruction, Tumor resection, Implantology, TMJ disorders, Cranio-facial orthognathic surgeries. CONCLUSIONS: It was concluded that using navigation in surgeries is one of the challenging fields. Although it is introduced to improve the accuracy of surgeries, it doesn’t give the wanted accuracy. However, Laser based navigation improves result accuracy to be almost accepted.

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SURGICAL NAVIGATION IN DENTAL IMPLANTS
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INTRODUCTION: Surgical navigation in dental implants is known as Computer-assisted implant surgery (CA IS). It represents a surgical concept and set of methods, that use computer technology for surgical planning, and for guiding or performing surgical implantation. METHODS: Data acquisition: The patient is scanned for image data acquisition with fiducial radiographic markers, Identification: The fiducial markers will be identified with a probe tracked by the system, Registration: the software will indicate the best localization on the arch between the image data and the patient, Navigation: Drilling instruments will be guided to a target point of impact with a 3D spatial orientation, Accuracy: Sustained accuracy procedures are critical during surgery and should prove reliability in regard to the system's overall accuracy, Feedback: Variations from the ideal position can be restricted by the software through inactivation of the drill or by an audible or visual cue. Types of trackers: Static which includes, Mechanical tracking systems, Magnetic tracking systems, Optical tracking system. Dynamic: marker directly fitted to the surgical handpiece, and guides the drill in real-time and in 3D to the correct implant position. CONCLUSIONS: This new technology is being developed to enhance accuracy of implant placement and to reduce angulation and alignment errors. The average deviation of placed from planned implants in this study was 0.8 mm, which is well accepted within the literature for computer-guided implantation.

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EXPRESSION OF MMP-8 IN THE INTERDENTAL TISSUES OF EXPERIMENTALLY INDUCED PERIODONTITIS FOLLOWING TREATMENT WITH NANOSILVER VERSUS TETRACYCLINE

Wafaa El-Hossary¹ and Ghada A. Abd el latif.²

OBJECTIVES: This study aimed to detect matrix metalloproteinase-8 (MMP 8) expression in the interdental tissues of rats following induction of periodontitis and treatment with either tetracycline or nanosilver. METHODS: This study included 55 male albino rats. Five rats served as healthy group, while periodontitis was induced in the other fifty by placing elastic rings around the cervix of the right maxillary incisors for 7 days. Following ligatures removal, five rats were sacrificed and served as positive control group. The remaining 45 rats were randomly assigned to three equal groups; Group I; did not receive any treatment. Group II; treated with tetracycline hydrochloride (50 mg /mL). Group III; treated with nanosilver (12.5μg /mL). Five animals from each group were sacrificed at day 7, 15 and 30 after ligature removal. The area of the maxillary incisors was processed for hematoxylin and eosin stain and MMP8 immunohistochemical stain. RESULTS: Local application of nanosilver in experimentally-induced periodontitis exhibited tendency for bone formation from day 7 with externalization of the inflammation compared to tetracycline application that showed comparable results at day 15 with localization of inflammation (abscess formation). MMP8 expression was strongly expressed after the induction of periodontitis. In nanosilver treated group, MMP8 started to fade within the connective tissue from day 15 meanwhile it was detected in the tetracycline group surrounding the abscess. CONCLUSIONS: MMP8 expression is intense in the inflamed periodontal tissues and negative in the healthy ones. This expression fades earlier with the nanosilver treatment in comparison to the tetracycline treatment.

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TUMOR NECROSIS FACTOR- PROMOTER POLYMORPHISM (308G/A) IN EGYPTIAN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)

Weam Ahmad Maher Rashwan

INTRODUCTION: Systemic lupus erythematosus (SLE) is an autoimmune disease characterized by the production of antibodies to components of the cell nucleus in association with a diverse array of clinical manifestations.

OBJECTIVES: Polymorphisms in cytokines genes may play an important role in the development and clinical manifestation. Due to this, there is a great interest in the identification of biomarkers that which could quantify the susceptibility and disease activity.

METHODS: A case–control study of 84 lupus cases and 138 lupus-free adults controls, was performed to analyze whether or not the polymorphism of the TNF-α gene promoter at positions -308 G/A would alter the risk for SLE and clinical manifestations. Genotyping was carried out by polymerase chain reaction, PCR products were digested by NcoI restriction enzyme and fractionated after on 2% Agarose gel and visualized posteriorly staining by ethidium bromide.

RESULTS: There were significant differences in the distribution of the TNF-α gene polymorphism between the SLE and control groups. Individual carriers of the variant allele A had a 2.24 (OR = 2.24 (95% CI 1.3–4.0))-fold increased risk for SLE. Moreover, association was observed between SLE patients and serositis (P = 0.003).

CONCLUSIONS: This study presents a preliminary evidence of association between TNF-α polymorphism and SLE susceptibility among Egyptians.
RECONSTRUCTION OF ISOLATED MANDIBULAR BOE DEFECTS WITH NON-VASCULARIZED CORTICOCELLOUS BONE AUTOGRAPH AND GRAFT VIABILITY

Ahmed Serag ¹ and Yaser Al-Rubaidi ²

INTRODUCTION: Reconstruction of mandibular defects following mandibular resection presents a big challenge to the reconstructive surgeon. Mandibular deformities and defects may result from trauma, infections, prior radiation exposure, neoplasms, and congenital defects. Most mandibular deformities arise as a result of ablative surgery for neoplasms. Reconstruction and Rehabilitation of the oral cavity following the resection of pathologic processes remains a complex challenge. OBJECTIVES: The aim of this study is to discuss the use of non-vascularized bone grafts in mandibular reconstruction and their viability. PATIENTS AND METHODS: In our study we operated on 25 cases of mandibular tumors requiring mandibular resection and that do not present problems of soft tissue shortage. CONCLUSIONS: Non-vascularized bone grafts can be successfully used in isolated bone defects of mandible in View of the excellent results and minimum rate of complications, the use of split rib bundlebone grafts could be a very useful method in mandibular reconstruction.

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EFFECT OF MODIFIED COPPER PHOSPHATE CEMENT ON REMINERALIZATION IN DIRECT PULP CAPPING: (IN VITRO & IN VIVO)
Yasser Gomaa ¹, Magdy Aly ²*, Housam Elmalahy ³ and Ihab Abdul-Hamid ⁴

INTRODUCTION: Galvanic currents play a significant role in some dental materials and it is the base of the innovation of copper phosphate cement as a capping material that enhances true remineralization. OBJECTIVES: This study was done to evaluate copper phosphate cement and its modified formula by adding silica as capping materials. STUDY DESIGN (in vitro and in vivo): we compared commercially available zinc phosphate cement with copper to a newly formulated one with adding nano and micro-sized silica. In vitro phase: we used 25 extracted human premolars; teeth were immersed in demineralizing solution and restored with different materials. Grouped according to capping material to group A-E, n=5 each; no material, varnish, Ca(OH)₂, zinc phosphate cement with copper or newly formulated one. Teeth were stored in saliva like solution for four weeks. Remineralizations were evaluated by Vicker’s Microhardness tests. Data were statistically analyzed by ANOVA. In vivo phase, 30 class V cavities were prepared in 10 rabbits and grouped according to the capping material (I-III; n=10); Ca(OH)₂, copper phosphate cement and the newly formulated one. Histopathological evaluations were done. RESULTS: Vickers microhardness number of groups A-E were 63.6, 52.3, 53.7, 58.9 and 59.4. Significant differences were observed between all groups except group C. For the in vivo phase: Group I and II showed dentine bridge formation. CONCLUSIONS: Both copper phosphate cement and newly formulated cement have promising pulp capping effect.

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