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- Introduction: The introduction should be brief and describe the purpose of the study.

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- Discussion: The discussion should deal with new ideas or importtance of the article.

- Conclusion: The conclusion should be linked with the aims of the study. Put asterisks (*) to highlight new hypotheses when warranted.

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About IDJ

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AIMS

Iraqi Dental Journal is a peer-reviewed, open access journal that publishes original research articles, review articles, and clinical studies in all branches of dentistry . It is dedicated to the dissemination of new knowledge and information on all sciences relevant to dentistry and to the oral cavity and associated structures in health and pathological conditions.

The role of the IDJ is to inform its readers of ideas, opinions, developments and key issues in dentistry - clinical, practical and scientific - stimulating interest, debate and discussion amongst dentists of all disciplines. All papers published in the IDJ are subjected to rigorous peer review.

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Managing Editors
Iraqi Dental Journal

SMART Approach for Judging Objectives

Any goal is not less important than anything else we need in our life. When we identify our goal, concentrate on it and achieve it, this means that we have put our feet on the right path. We must distinguish between two concepts: wishes and goals and we need definite criteria to make this distinction. Sometimes wishes are dreams which cannot be realized without programming them in the form of objectives and mechanisms. The best way to do this is by following the **SMART** criteria for putting and evaluating objectives. We can summarize these criteria as follows:

- **S** stands for **S**pecific. Objective must be specific, not general.
- **M** stands for **M**easurable. Objectives should be quantifiable and we can measure them because immeasurable objectives are difficult to accomplish since their beginnings and endings are unknown.
- **A** stands for **A**chievable/**A**ttainable. Objectives must be feasible within our control and influence and are achievable with the available resources.
- **R** stands for **R**ealistic/ **R**elevant. Objectives must be realistic, logical and relevant.
- **T** stands for **T**ime-bound. Objectives should be linked to a time frame that creates a practical sense of urgency. We must know when to start and when to finish.

The goal of the Iraqi Dental Journal is to be equal to other distinguished dental academic journals in the world. We have already specified our goal to be a distinguished journal and the first step towards this goal is to enter local and international electronic websites and the Internet and to be reviewed and evaluated by academics from Iraq and other countries as well. Another important step to become distinguished is to publish papers and researches from people all over the world in addition to Iraq. We strongly believe that this goal is attainable with the cooperation and support of intellectual Iraqi academics and their colleagues in other countries. We also believe that this goal is realistic and we are confident and determined to accomplish it insha'Allah (God willing).

Rafi M. Al-Jobory
Editor in Chief

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The Role of Infliximab Local Injection on Orthodontic Tooth Movement in Experimentally Induced Diabetic Rabbits

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ABSTRACT

Introduction: Orthodontic treatment in diabetic patients is usually associated with periodontal disease and bone loss. Proinflammatory tumor necrosis factor-alpha (TNF-α) level increases in the periodontal tissue during orthodontic treatment. The aim of this study was to investigate the effect of infliximab (tumor necrosis factor-α antagonist) local injection on orthodontic tooth movement in diabetic rabbits.

Methods: Diabetes was induced in 22 male adult rabbits using Alloxan intravenous injection(100mg/kg). The level of blood glucose was controlled using subcutaneous insulin injection(0.5 IU/Kg Body weight). An orthodontic appliance was placed on the upper central incisors of all rabbits for 18 days to create a space between the two teeth. The rabbits were divided into two equal groups, the experimental group received 5mg/kg subperiosteal injection of tumor necrosis factor-alpha antagonist (infliximab)in the labial side of the upper central incisors in three time intervals (0,7,13 days)of the study period. The control group received equivalent volume of normal saline in the same location and same time intervals as experimental group. Clinical measurement of the created space were done in (5, 9,13, 18) days of the studying period .

Results: There was a significantly smaller rate of tooth movement in experimental group than control group represented by smaller spaces created.

Conclusions: Local injection of infliximab decrease the movement of the tooth during orthodontic treatment in experimentally induced diabetic rabbits.

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder characterized by impaired action, secretion of insulin or both, resulting in hyperglycemia. DM has been associated with the occurrence of a series of complications involving the skeletal system like increased risk for occurrence of osteoporosis, poor osseous healing, and impaired bone regeneration potential[1].

A number of oral disorders have been associated with diabetes mellitus like gingivitis and periodontitis that has received the greatest attention[2].

Orthodontic tooth movement is achieved by the remodeling of alveolar bone in response to mechanical loading[3]. An alteration of the metabolic state that interferes with bone remodeling can result in a different rate of tooth movement [4] .

The need for orthodontic treatment in diabetic patients is usually associated with number of problems related to periodontal degradation , tooth loss, and abnormalities in the development of the jaws[5]. **Braga** *et al* [6] stated that the specific diabetic changes in the periodontium are more pronounced following orthodontic tooth movement. They used nickel-titanium coiled spring between the maxillary right first molar and the incisors of diabetic and normal mice with force of 35 g. The appliance resulted in greater orthodontic tooth movement in diabetic group than in normal group .

Patients with well-controlled diabetes are not contraindicated for orthodontic treatment [7]. Diabetes may exert an effect on the periodontium through cytokine dysregulation. This is supported by a study in which poor glycemic control was significantly correlated with greater production of cytokines with higher cytokine levels in gingival fluid [8]**.** Furthermore, diabetic mice exhibit prolonged inflammation in response to *P.gingivalis*, which is due in part to TNF dysregulation [9]**.**

Tumor necrosis factor-alpha (TNF-α) is a potent immunomediator and proinflammatory cytokine that is rapidly upregulated in the brain after injury and secreted by macrophage, monocyte, and neutrophile[10].

In *in vivo* studies, patients with periodontitis and diabetes were found to have significantly higher levels of local pro-inflammatory mediators such as interleukin-1β and tumor necrosis factor-α, compared to systemically healthy individuals with periodontal disease[11].

Pro-inflammatory cytokines, such as TNF-α, are thought to play a role in bone remodeling and osteoclast differentiation. In rats and in humans , orthodontic tooth movement increases the levels of TNF-α in the periodontal tissues[12],and reflects changes to multiple components of the periodontium[4].

TNF-α modifying processes directly associated with tooth movement and may also induce mediators of the inflammatory process, which will then influence

osteoclast recruitment and function, suggesting an important role for TNF- α in orthodontic tooth movement[13].

Many attempts have been done to decrease bone resorption during orthodontic treatment using different systemic or local application of medications and the intake of dietary supplements, such as minerals[14], hormones[15], proteins[16] and immunomodulators[17].

Infliximab is a monoclonal antibody against tumour necrosis factor-α. It binds to soluble and membrane-bound TNF-alpha with a high affinity, and inhibits its effect by blocking TNF receptors interaction. Infliximab inhibits bone destruction effectively and treatment with infliximab resulted in significant early decrease in the inflammatory markers[18].

In a study done by **Liu** *et al* **2006**[19] when they inoculated *Porphyromonas gingivalis* into the scalp of diabetic and normoglycemic mice and used Etanercept(TNF-α inhibitor)by two ways of injection, systemically(intraperitoneal) and locally(subcutaneous) in the site of bacteria-induced injery, they noted that the inhibition of TNF-α increases new matrix formation significantly and reduces apoptosis of bone-lining cells in diabetic but not normoglycemic mice. In addition, TNF-α antagonist significantly raised the number of osteoblastic cells to a level that was similar to the normoglycemic group.

In a study on cytokine expression and its inhibition, Zhang *et al* 2003 [20] found that after daily intraperitoneal injections of 2ml of 1 µg/ml soluble receptors to TNF-α (sTNF-α -RI) in Wistar rats induced an inflammation by mechanical injury using a sterilized, flat, needle-like instrument that inserted to 1 mm in depth on the the mesial gingival margin of the upper left first molars, the results demonstrated that in TNF-α receptor groups the amount of bone and root resorption was significantly reduced following systemic application of sTNF-α –RI.

A study done on Macaca facicularis monkey by **Assuma** *et al* **1998** [21] with induced periodontitis and alveolarbone loss through tying *porphyromonas gingivalis*-soaked suture ligatures around the posterior mandibular teeth, local injection of soluble receptors to IL-1 and TNF was given three times each week for 6 weeks. The results recorded inhibition of the inflammatory cells in close proximity to bone by approximately 80% , the formation of osteoclasts was reduced by 67% at the experimental sites compared with that at the control sites, and the amount of bone loss was reduced by 60%.

This study was done to investigate the role of local infliximab (TNF-α antagonist) injection on orthodontically moved teeth in experimental induced controlled diabetic rabbits.

METHODS

This study used 22 male local breeded rabbits weighing 1.5-2 kg. At the beginning of the experiment, all animals were kept under standardized laboratory conditions of light-and-dark schedule and relative humidity and fed *ad libitum* with commercial pellets and water from thick-walled glass dishes. Diabetes was induced in all rabbits by a single dose of intravenous (lateral ear vein) injection of alloxan 100mg/kg(fig.1), then immediately the animals were injected by 10cc of glucose 20% subcutaneously and then 10cc of glucose every 4 hours for 24 hours to prevent hypoglycemic convulsion. Drinking water of the animal was substituted by glucose solution 5% for 24 hours to prevent hypoglycemia[22]. Fasting blood glucose was evaluated every morning for 7days post-injection using Accu-ChekActive monitoring system. Alloxan-injected rabbits were considered to have diabetes if fasting glucose levels were>300mg/dL.[1,4].

Figure 1: Intravenous (lateral ear vein) injection site of Alloxan .

After confirming diabetes in the rabbits, insulin treatment was started by subcutaneous injection of 0.5 IU/Kg body weight every 48 hours in the morning [22]. The controlled diabetic rabbits were left for 8 weeks before performing the orthodontic procedure in order to give sufficient time for diabetes mellitus to affect the body tissues[5]. After 8 weeks, rabbits were anaesthetized by intramascular injections of xylazine 2%(4mg/kg B.W.)and Ketamine hydrochloride (40mg/kg B.W)mixture in order to fix the orthodontic appliance[22] . Orthodontic appliances were placed for all rabbits for about 18 days. They consisted of two mini buccal tubes bonded to the labial surface of the upper central incisors vertically positioned parallel to long axis of the incisors in the cervical third of

clinical crown. L-shaped wire consisted of 2 pieces of 0.017*0.025 inch stainless steel wires, was inserted in the both tubes . The force was applied by light strength nickel-titanium open coil spring which was fitted over the two horizontal wires sections between the two upper central incisors(fig. 2and3). The force level after activation was approximately 35gm measured using Bolye gauge. This force resulted in distal movement of each upper central incisors gaining median space between the two central incisors.

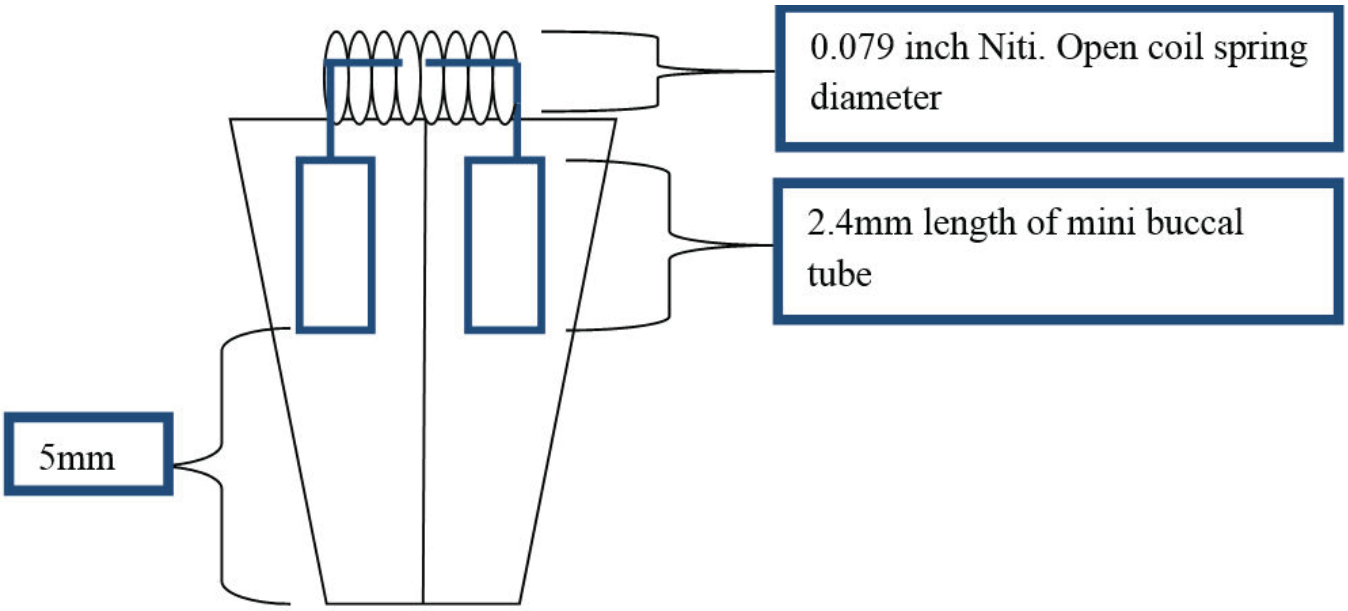

Figure.2: Orthodontic appliance on upper central incisors before activation

Figure 3: Diagram showing the orthodontic appliance used in the study

The rabbits were divided equally into 2 groups (11 rabbits for each): an experimental group which received subperiosteal injection of 0.1 ml of TNF-α antagonist (infliximab 5 mg/ kg) in the labial side cervically [23]. The remaining 11 rabbits were considered as a control group which received 0.1ml normal saline injection in the same site as in the experimental group(fig.4). The local injection of both infliximab and normal saline were given in three different time intervals (1st, 7th and 13th day) following insertion of the appliance. To quantify and record the amount of tooth movement, four measurements were performed for each rabbit by measuring the distance between the two mid point of the mesial surface at

cervical line of central incisors at (5^{th}, 9^{th}, 13^{th}, 18^{th} day) using digital vernier sensitive to 0.01 mm. This point was chosen in order to stick to a fixed point during measurement.

Figure 4: Infliximab and normal saline injection site

Descriptive statistics: means and standard deviations were calculated for both groups. Unpaired student t-test, showing differences in means of spaces between control group and experimental group at different times with standard deviation(SD) for each group. Measurements were in mm,(P value≤ 0 .05 was considered statistically significant).

RESULTS

The insertion of the designed orthodontic appliance resulted in distal movement of the two central incisors with minimum distortion for the gingival tissue and for the appliance in both experimental and control group. (fig 5)

Figure 5:Orthodontic appliance on upper central incisors at the end of the study.

The injection of infliximab in the labial side of orthodontically moved teeth resulted in obvious changes which were recorded and measured clinically. The statistical analysis of the clinical measurement in day(5 and 9) revealed a highly significant difference between experimental and control groups(P< 0.001). While there was very highly significant difference in the mean of the space between the two groups in day (13 and 18), The mean space was(**1.909 ±0.459**mm)in experimental group in day 5, while in control group it was(**2.554 ±0.509**mm). In day 9, the mean space was(**2.791 ±0.505**mm) in experimental (infliximab given)group, while in control group it was(**3.436 ±0.406** mm). In day 13 the mean space was(**3.745±0.503**mm) in experimental group, while in control group it was(**4.554 ±0.378**mm), where in day 18 the mean of space in the experimental group was(**4.591 ±0.503**mm),while in control group was(**5.618 ±0.346**mm) as shown in figure 6.

From the statistical data and from figure 6, it is obvious that the experimental group which received infliximab injection showed less tooth movement than the control goup.

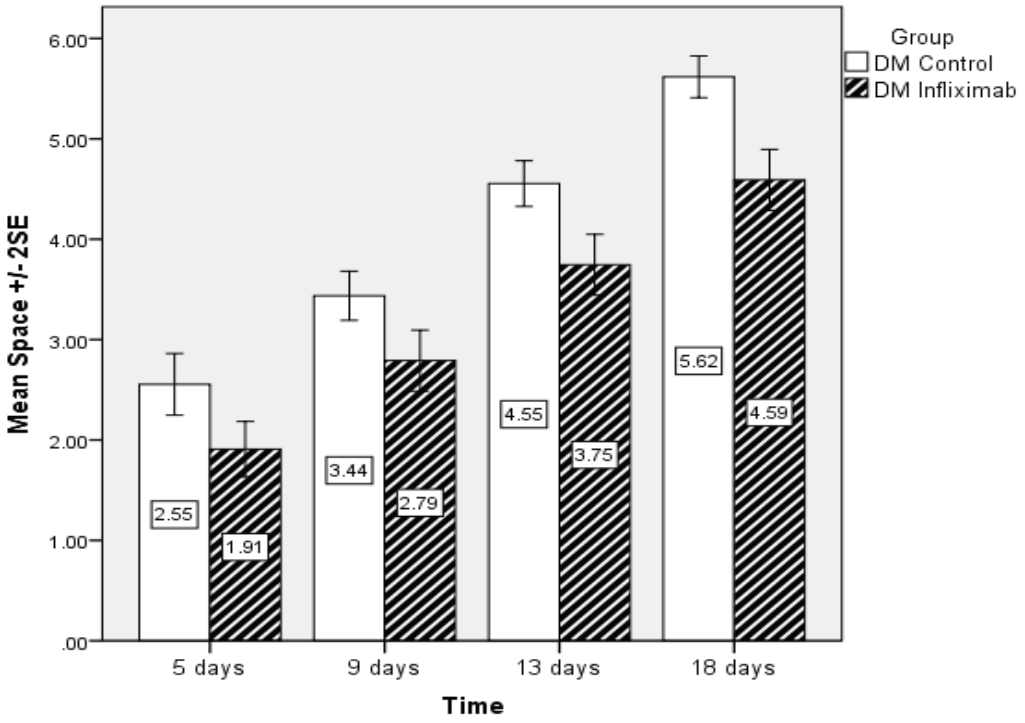

Figure 6: Unpaired student t-test of means and standered deviation(±S) of spaces between the two maxillary incisors in both controls and infliximab(experimental) group.

DISCUSSION

Orthodontic tooth movement occurs by the remodeling of alveolar bone as a result of the force that is exerted on the periodontium[6]. In this study, a nonhuman primate model was used to assess the effect of local administration of TNF-α antagonist (infliximab) on the rate of tooth movement in diabetic model in an attempt to interfere with cytokines which are usually elevated during orthodontic tooth movement[12] and diabetes mellitus[11]. To the best of our knowledge there is no previous clinical study on the effect of local infliximab injection on orthodontic tooth movement especially in diabetic model. The results of this study were comparable with those obtained from rats with experimentally induced tooth movement following a constant tipping force of 0.5 N on upper first molar. The studied animals received daily intraperitoneal injection of 2ml of 1µ/ml of soluble receptors to TNF-α and IL-1 , The amount of tooth movement after 3,6,9 and 12 days was reduced especially for the group treated with receptors to TNF-α by approximately 50 persent [24].

An increase in the expression of TNF-α was observed in periodontal tissues surrounding teeth of diabetic mice more than in normoglycemic mice at 12 and 72 hours of orthodontic appliance mechanical loading which exhibited greater orthodontic tooth movement and a higher number of osteoclasts during histomorphometric analysis[6].

Another comparable study done by **Andrade *et al* 2007** [12] on a nonhuman primate model which use the orthodontic appliance of NiTi coil spring between the maxillary right first molar and the incisors in Wild-type mice(WT)and p55-or TNF-RI deficient mice ($p55^{-/-}$). The levels of TNF-α and chemokines were evaluated in periodontal tissues with a significantly smaller rate of tooth movement, and lower number of TRAP-positive osteoclasts in $p55^{-/-}$ mice than that observed in Wild type mice.

The results of thr present study demonstrate that the local injection of infliximab caused a significant reduction in tooth movement in day 5 and day 9, which is considered to be due to

bone resorption by osteoclasts ,while there was a high significant difference between the two groups at the day 13th and 18th revealing that in diabetic group, the increasing bone resorption after orthodontic force application was sustained for longer time. This finding agrees with **Li** *et al* **2010** [4] study on remodeling of periodontal ligament in diabetic rats. They found markedly increase in osteoclasts in the PDL at the edge of the alveolar bone in the diabetic groups after application of orthodontic force and peaked at day 7. This increase was returned to a normal level gradually in the normal group. However, in diabetic animals, the elevated numbers of osteoclasts were sustained for a longer time under the same force, leading to extended period of the bone destruction. There was a significant difference between the experimental and control groups at day 14 reflecting a large decline in osteoclast number in the normal group versus a small decrease in the diabetic group.

When alveolar bone loss is induced, there is a dramatic increase in leukocyte recruitment in close proximity to bone. The presence of blockers to IL-1 and TNF, decreases the recruitment of leukocytes substantially. This suggests that bone loss is initiated when the inflammatory stimulus spreads to the deep gingival connective tissue, stimulating the recruitment of leukocytes. Thus, blocking TNF-α activities may inhibit bone loss both directly and indirectly; the latter occurring via decreased recruitment of mononuclear cells in the area of bone[21].

In this study, the tooth movement in control group was increased steadily until day 18 and there was a highly significant difference at this day between the control group and the experimental group, this may reflect the time accumulation effect of infliximab at the end of orthodontic movement in experimental group .

Our results demonstrated that diabetic rabbits with infliximab represented an increased tooth movement, this may be due to the inhibition of TNF-α leading to increase in new bone matrix formation and a significant reduces in apoptosis of bone-lining cells in diabetes, and, consequently, a greater number of osteoclasts and bone resorption [25], in addition, TNF-α antagonist significantly raised the number of osteoblastic cells and controlling the production of chemokines and osteoclasts[12].

The decreasing in tooth movement in the experimental group may be related to decrease in bone resorption, since infliximab binds to soluble and membrane -bound TNF-α with high affinity, impairing the binding of TNF-α to its receptor[26]. Another action for infliximab which may play a role in the reduction of the inflammatory reaction through killing cells that express TNF-α through antibody-dependent and complement-dependent cytotoxicity[27].

The clinical result of this study need to be confirmed histologically and ultrastructurally prior to the recommendation of using local infliximab injection as an adjunctive in orthodontic treatment to reduce tooth movement especially in anchorage tooth or to control tooth movement in medically compromised patients.

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The Value of Maxillary Central Incisors and Canines in Gender Determination as an Aid in Forensic Dentistry

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ABSTRACT

Background: This study aimed to determine the gender of a sample of Iraqi adults utilizing the mesio-distal width of maxillary central incisors and canines and to determine the percentage of dimorphism as an aid in forensic dentistry.

Materials and methods: The sample included 230 subjects (115 males and 115 females) with an age ranged between 17- 25 years and Class I dental and skeletal relations. Study casts were taken for each subject and the mesio-distal crown dimension was measured manually from the contact points for the maxillary central incisors and canines (both sides) using digital vernier caliper gauge. Descriptive statistics were obtained for the measurements for both genders; independent samples t-test was performed to evaluate the gender difference, percentage of dimorphism and stepwise discriminant function statistics were performed to determine the teeth that can be used for gender identification in addition to the percentage of gender identification accuracy.

Results and Conclusions: Generally, the mesio-distal dimensions of the maxillary central incisor and canine were larger in males than females with a high significant difference ($P \leq 0.001$). Stepwise discriminant function statistics indicated that the right central incisor and canine were the most predominant teeth in gender identification and the accuracy of identification reached up to 69.6%.

Keywords: Mesio-distal tooth dimension, forensic dentistry, gender determination.

INTRODUCTION

Genderual dimorphism refers to the systemic difference in the form (either in shape or size) between individuals of different genders in the same species. Teeth of various species are known to exhibit genderual dimorphism [1].

Gender determination is one of the important parameters in forensic identification. Teeth being the central component of the masticatory apparatus of the skull are good sources of material for civil and medico-legal identification. Teeth provide resistance to damage in terms of bacterial decomposition and fire when the rest of body is damaged beyond recognition which makes them valuable tool in forensic investigation [2].

Sex determination using dental features is primarily based upon the comparison of tooth dimensions in males and females or upon the comparison of frequencies of non-metric dental traits like Carabelli's trait of upper molars, deflecting wrinkle of the lower first molars, distal accessory ridge of the upper and lower canines or shovelling of the upper central incisors [3]. This is based on the fact that although the morphology of the tooth structure is similar in males and females, the size of the tooth does not necessarily remain the same, as the tooth size is determined by cultural, environmental, racial and genetic factors [4].

Many researches were done to identify the genders using the maxillary and mandibular canines. They depended on the mesio-distal dimension of these teeth [5,6] and in many articles on the inter-canine width in addition to the mesio-distal width to get the canine index and standard canine index [2,7-17]. Other researches studied the bucco-lingual dimension of teeth [18,19], height of tooth [3] and permanent maxillary first molar [20] as a base for gender identification.

This study aimed to determine the gender of a sample of Iraqi adults utilizing the mesio-distal crown dimensions of the maxillary central incisors and canines with the aid of stepwise discriminant function statistics and to determine the percentage of dimorphism.

MATERIALS AND METHODS

SAMPLE

The sample comprised 230 Iraqi Arab subjects (115 males and 115 females) with an age ranges between 17 and 25 years. They had normal skeletal and dental pattern [21] i.e. had class I skeletal relation and class I dental relation with a full set of permanent well-aligned caries free teeth (regardless the wisdom teeth) and normal overjet and overbite with no history of orthodontic treatment, maxillo-facial trauma, surgery or defect.

METHODS

1. History and clinical examination

Each subject was asked to sit comfortably on the dental chair and asked information about the name, age, origin, medical history, the history of facial trauma and orthodontic treatment. Then they were asked to look forward horizontally (Frankfort plane parallel to the floor) for clinical examination (extra-orally and intra-orally) to check their fulfillment of the required sample selection.

2. Dental cast analysis

Dental cast production

Impressions were taken for every subject using Alginate impression material then poured with a prepared amount of stone. After setting of the dental stone, Plaster of Paris was prepared and put in the rubber base mold, and the poured cast was inverted over it. After the final setting of the gypsum, the cast was opened from the mold and made ready for the measuring procedure.

Mesio-distal crown dimensions measurements

The procedure of determining the mesio-distal crown width of the right and left maxillary central incisors and canines was done by measuring the greatest mesio-distal crown width of these teeth from the anatomic mesial contact point to the distal one [22]. The measurements were made to the nearest 0.1 mm by using the digital sliding caliper gauge with pointed beak inserted in a plane parallel to the long axis of the tooth.

STATISTICAL ANALYSES

The data of this study were analyzed with SPSS version 15 program. The statistical analyses included:

a) Descriptive statistics: means, standard deviations and statistical tables.

b) Inferential statistics:

1. Independent sample t-test to evaluate the genders difference.
2. Percentage of dimorphism which is the percentage by which the tooth size of males exceeds that of females {it equals to = $[(X_m/X_f)\text{-}1x100]$ where X_m is the mean tooth dimension of males and X_f is the mean tooth dimension of females} [23].
3. Stepwise discriminant function statistics to determine the teeth that can be used in gender identification in addition to the percentage of gender identification accuracy.

RESULTS AND DISCUSSION

Crowns of permanent teeth are formed at an early stage and their dimensions remain unchanged during further growth and development, except in cases when specific changes and disorders in terms of functionality, pathology and nutrition can have effect on the normal dimensions of a tooth. Because of that odontometric features of teeth can be used in determining sex after the tooth has erupted even in children whose osseous features of the sex are not yet defined [24].

Human sexual dimorphism is said to be an outcome of a survival strategy, a balancing of the need for high degree of biological variation within the species with the need for a narrow range of variation in the female, who is physically structured for the support of an infant prenatally and postnatally [25]. Thus, the differences are a reflection of the ongoing processes of evolution. The genetic basis for variation has been explained by a polygenic model of inheritance. This is the basis of the sexual dimorphism in the morphological and metric attributes of males and females [26].

In Iraq, this is the third study that tries to identify the gender. Rashid and Ali [27] used the linear measurements related to the mental and mandibular foramina vertical positions on digital panoramic images in sex determination. They found statistically significant differences in all of the linear measurements between genders where males almost have higher measurements than females. Linear measurements related to the mandibular foramen vertical position can be used as best parameters to predict genders, while the measurements that related to the mental foramen vertical position ranked after in their discriminating abilities. Ali and Al-Nakib [28] evaluated the accuracy of digital cephalometric system in sex determination in Iraqi samples with different age range using certain linear and angular craniofacial measurements. They found that all the cranio-cephalometric measurements gave 86.7% overall predictive accuracy of sex determination by discriminant analysis while the stepwise selection method gave 85.8% overall predictive accuracy. These methods are X-ray dependant which is hazardous and not cheap. In the present study, measuring the tooth width is easy, fast and can be done intra- or extra-orally.

The results indicated that the mesio-distal crown dimensions of the right maxillary central incisor and canines were higher in males than females (Table 1) with a high significant difference ($p \leq 0.001$). This comes in agreement with many researches [5-8, 11,12].

Table 1. Descriptive statistics of the mesio-distal dimension of the measured teeth and genders difference

Teeth	Genders	Descriptive Statistics		Genders difference (d.f.=228)	
		Mean	S.D.	t-test	p-value
RCI	Males	8.83	0.54	5.09	0.000 ***
	Females	8.50	0.42		
LCI	Males	8.84	0.51	4.89	0.000 ***
	Females	8.54	0.44		
RC	Males	8	0.49	6.23	0.000 ***
	Females	7.63	0.42		
LC	Males	7.95	0.50	5.47	0.000 ***
	Females	7.61	0.45		

RCI= Right Central Incisor, LCI= Left Central Incisor, RC= Right Canine, LC= Left Canine , *** **Highly significant ($p \leq 0.001$)**

Discriminant analysis involves the determination of a linear equation like regression that will predict which group the case belongs to. The aim of the statistical analysis in discriminate analysis is to combine (weight) the variable scores in some way so that a single new composite variable, the discriminant score, is produced.

Discriminant analysis creates an equation which will minimize the possibility of misclassifying cases into their respective groups or categories. The form of the equation or function is:

$$D = a + b1x1 + b2x2 + \ldots + bnxn$$

D is predicted score (discriminant score: this is a weighted linear combination (sum) of the discriminating variables.)

a is constant

x is predictor and

b is discriminant coefficient.

Stepwise discriminate analysis, like its parallel in multiple regressions, is an attempt to find the best set of predictors. It is often used in an exploratory situation to identify those variables from among a larger number that might be used later in a more rigorous theoretically driven study

In stepwise discriminate analysis, the most correlated independent is entered first by the stepwise programme then the second until an additional dependent adds no significant amount to the canonical R squared [29].

Using the stepwise discriminant function statistics, gender identification can be determined and the percentage of identification accuracy can be obtained.

In this study, only the right maxillary central incisor (RCI) and canine (RC) showed high correlation and the left side of these teeth was excluded, so the formula was:

D= -21.53 + 1.033(RCI) +1.609(RC)

A further way of interpreting discriminant analysis results is to describe each group in terms of its profile, using the group means of the predictor variables. These group means are called centroids. In this study, males had a mean of 0.468 while females produce a mean of –0.468. The cut-off point for discrimination between the gender is ½ (0.468 + (-0.468)) = 0. If the calculated discriminant score is less than zero the case is classified as "Female" and if the score is greater than or equal zero, the case is classified as "Male"

As shown in table 2, the percentage of accuracy of gender identification were 67, 72.2 and 69.6% for males, females and total sample respectively using the right central and canine as predictors.

When the right canine was taken into consideration only, the percentages were 65.2, 67.8 and 66.5% respectively. These percentages were higher than of Khangura *et al.* [5]. While for right central incisor, the percenatges were 56.5, 67 and 61.7% respectively.

Table 2. Percentage of accuracy of correctly classified and misclassified cases

Genders	Accuracy of gender determination using RC and RCI				Accuracy of gender determination using RCI				Accuracy of gender determination using RC			
	Correctly Classified		Misclassified		Correctly Classified		Misclassified		Correctly Classified		Misclassified	
	No.	%*	No.	%*	No.	%*	No.	%*	No.	%*	No.	%*
Males	77	67	38	33	65	56.5	50	43.5	75	65.2	40	34.8
Females	83	72.2	32	27.8	77	67	38	33	78	67.8	37	32.2
Total	160	69.6	70	30.4	142	61.7	88	38.3	153	66.5	77	33.5

***The percentage of accuracy was obtained by dividing the number of cases by the total number multiplied by 100.**

The percentages of dimorphism were higher in right central and canine than the left side confirming the results of discriminant analysis (Table 3), i.e. the right central and canine are more dimorphic than left central and canine, with higher percentage for the canine.

Table 3. Descriptive statistics of the mesio-distal dimension of the measured teeth and percentage of dimorphism

Teeth	Genders	Descriptive Statistics		Percentage of dimorphism
		Mean	S.D.	
RCI	Males	8.83	0.54	3.83
	Females	8.50	0.42	
LCI	Males	8.84	0.51	3.60
	Females	8.54	0.44	
RC	Males	8	0.49	4.88
	Females	7.63	0.42	
LC	Males	7.95	0.50	4.48
	Females	7.61	0.45	

It is suggested that the way of influence of the Y chromosome on the amelogenesis is regulatory, and that the difference in tooth size between males and females is explained by a differential growth-promoting effect of the Y chromosome compared to the X chromosome. The general finding that tooth crown sizes in males exceeded, on average, those in females resulted from a greater thickness of dentin in male teeth. The difference is explained by the promoting effect of the Y chromosome on dentin growth, probably through cell proliferation. It is conceivable that due to the Y chromosome, mitotic potential is increased, which at different stages of development leads to the increase in cell division and may also account for other differences in the dentition [30,31].

Generally, canine gives accuracy more than the central incisor in gender determination in both tests (Table 2 and 3); this is because of the greater thickness of enamel in males due to the long period of amelogenesis compared to females [32].

CONCLUSION

This study is the first of its type in Iraq to determine the genders using the mesio-distal dimensions of maxillary central incisors and canines with the stepwise discriminant function statistics. The method in this study is simple and inexpensive to conduct, so it can be applied in forensic dentistry for establishing gender identity of an individual and gives accuracy of genders identification reached up to 69.6% for the total sample in addition to that right central incisor and canine were the most important teeth in this study to develop the formula that determine the discriminant score.

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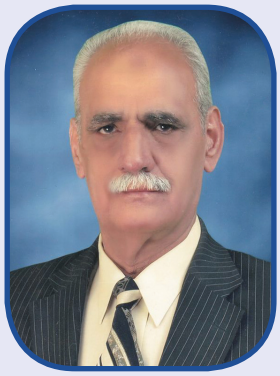
Hedging in Medical Research Papers

Khdiar Shahatha Ali



Definition and reason for using hedges

The main purpose of academic medical English is to express facts, proved findings and information without bias. Hedging is one of the characteristic features of scientific medical discourse. A **hedge** is a mitigating word or expression used to lessen the impact of an utterance, to avoid criticism, and to save face. Academic writers rarely use assertive language; they rather tend to use cautious language. Therefore, they often avoid expressions that indicate a high level of certainty such as: ***without a doubt, certainly, undoubtedly, definitely, there is no doubt that, absolutely.***

Hedging devices in English

A wide range of words, phrases, and sentences can be used:

Modal auxiliary verbs: *can, could, may, might, should, would,*

Modal introductory verbs: *seem, tend, look like, appear to be, think, believe, doubt, be sure, indicate, suggest, estimate, assume*

Probability adjectives: *likely, possible, probable, unlikely*

Modal nouns: *assumption, possibility, probability, evidence*

Probability adverbs: *perhaps, possibly, probably, presumably*

Frequency adverbs: *generally, usually, often, occasionally*

To-clause + adjective: *It may be possible to obtain ….,. It is important to develop … , It is useful to study ….. .*

That- clauses: *It could be the case that,. It might be suggested that***,**

3. Examples: Examine the following sentence:

There is no doubt the present study is the first attempt to deal with this problem.

The above sentence shows a high level of certainty, which is not a feature of scientific writing. This could be seen as impolite and also academically naïve and the writer of such a sentence may be looked upon as being pompous and arrogant. It could be hedged by using one of the devices mentioned above.

The present study is perhaps one of the attempts to deal with this problem.

To our knowledge the present study may be one of… to our knowledge

Exercise Decide which of the sentences below are considered to be academically competent (hedged). Try to hedge those which are not competent by using a hedging word or expression.

This therapy overcomes all of the morbidities associated with conventional therapy.

More research is needed to determine the ideal doses of botulinum.

These disorders results from complications following major salivary gland surgery.

Patients with SCD have increased susceptibility to dental caries.

Extensive proximal cutting and restoration definitely affect crown flexure.

Porcelain veneers showed biometric behavior.

Our results suggest that patients with SCD are more susceptible to dental caries compared to general population in this community.

We believe that a study with a larger sample should be conducted.

The tissue reduction results from a complex interaction between bacteria and the host immune system.

A possible mechanism for periodontal extracellular matrix degradation is the …..

Traumatized Anterior Teeth among 13-15 Years Old Intermediate School Students in Hilla City, Babylon Governorate- Iraq

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ABSTRACT

Background: Dental trauma in children and adolescents is a common public health problem in all societies and the prevalence of these injuries has increased during the past few decades. Injury of permanent teeth may cause cosmetic, functional and psychological problems to the patient. The aim of this study was to investigate the prevalence and severity of traumatized anterior teeth in relation to age, gender, type of injury and type of occlusion.

Materials and methods: An epidemiological survey was conducted through clinical exanimation of permanent anterior teeth among 3855 students, 13-15 years old enrolled in 17 public intermediate schools in Hilla city. Dental trauma were assessed according to Garcia-Godoy classification. Recording the type of occlusion according to criteria of Millis.

Results: The prevalence of students with traumatic dental injuries was 7.1% of the total sample. Simple enamel fracture was the most common type of injury among traumatized teeth while luxation was the least common type of dental injury. Males were more affected than females with statistically significant difference (P<0.001). while dental trauma was not associated with age (P>0.05). The highest prevalence of dental trauma was recorded among the 14 year age (7.9%). Most of the traumatized subjects had only one tooth traumatized (71.3%).The highest prevalence of traumatized students were found in class II division 1 malocclusion.

Conclusion: The prevalence of traumatized dental injuries was highly associated with gender and with class II division 1 malocclusion while it was not associated with age. Simple enamel fracture was the most common type of injury.

Keywords: Dental trauma, permanent teeth, type of occlusion.

INTRODUCTION

Dental trauma is an injury to the mouth, including teeth, lips, gingiva and tongue and the most common dental trauma is a broken or lost tooth[1] . In addition to that tooth injury could be described as a fracture , luxation or avulsion although a combination of injuries may occur in the same tooth [2]. The etiological factors of dental injuries are many and varied[3]. Although accidents due to falls appear to be the most common factor in both primary and permanent dentitions. Accidents as a result of sports, violence and road traffic accidents were the most common causes of dental trauma in permanent dentitions[4]. The frequency of trauma to the permanent dentition in school age children peaked in the age group 9-15 years [5] and 11-15 year olds [6]. In general, males were affected almost twice as females in both the primary and permanent dentitions[7, 8]. Traumatic dental injury may vary in its severity from a simple enamel fracture, which is the most prevalent type to multiple types of trauma affecting both soft and hard tissue, and even it may reach to a complete avulsion of the tooth [9, 10,]. Dental trauma may be classified into categories based on treatment protocols, these categories include: Enamel and crown fracture, dental luxation, dental extrusion and intrusion, dental concussion and subluxation, root fracture and dental avulsion[11] .

Dental injuries were approximately twice as frequent among children with class II division 1 malocclusion as among children with normal occlusion[10,12]. Maxillary central incisors were considered the most common injured teeth for both the primary and permanent dentitions while mandibular central incisors were the least teeth affected by trauma[13,14] .Other study reported that the dental injuries of secondary school children age 13-15 years old were almost entirely restricted to the maxillary central incisors (75%)[6].

Although many Iraqi studies had been conducted on the traumatized anterior teeth[8,10,15,16] but this study is considered the first one in Hilla city as there is no previous study in this city, so the aim of this study was to assess the prevalence and severity of traumatized anterior teeth in relation to age, gender, type of injury, dental treatment needs and type of occlusion to be used as a base line data.

MATERIALS AND METHODS

In this epidemiological study, a sample of (3855) 13-15 years old students. (2035 males and 1820 females) were selected randomly by cluster stratified sampling method from urban intermediate schools from different geographical areas in Hilla City,Babylon Governorate/ Iraq. Oral examination was performed in classrooms, the standard conditions for examination were followed according to the World Health Organization [17]. Examination of teeth to identify the type of the traumatic injury was performed according to the criteria of Garcia-Godoy [9]:

Class 1: Enamel fracture. Class 2: Enamel-dentin fracture without pulp exposure. Class 3: Enamel-dentin fracture with pulp exposure. Class 4: Enamel-dentin and cementum fracture without pulp exposure. Class 5: Root fracture. Class 6: Concussion (injury to the tooth without abnormal

loosening). Class 7: Luxation (loosening). Class 8: Intrusion (displacement of the tooth into the alveolar bone). Class 9: Extrusion (partial displacement of the tooth out of alveolar socket). Clsss 10: Avulsion(complete displacement of the tooth out of alveolar socket).

The type of occlusion (anterio-posterior occlusion) recorded in accordance to the criteria of Millis[18], students with chronic diseases and under orthodontic treatment were excluded from the study. Visual and tactile examinations were used for recording the type of dental injuries. Root fracture(Class 5) was not recorded as no radiographs were taken. A tooth that showed more than one type of injury was recorded once according to the highest score and when more than one tooth is traumatized the highest score is considered when type of dental injury is counted for each subject. Analysis of data was carried out using SPSS version 12. Statistical tests used were Paired t-test,Chi-square, Z-proportion test. The confidence limit was accepted at 95% , $P< 0.05$ was regarded as statistically significant and $P< 0.01$ were regarded as highly significant.

RESULTS

The study population consisted of 3855 students attending intermediate schools in Hilla city. 2035 of the sample were males (52.8%) and 1820 were females (47.2%) with an age ranged from 13-15 years. The distribution of the sample summarized in Table (1). Table (2) shows that the prevalence of traumatized students was found to be (7.1%) of the total sample examined, this prevalence was not associated with age ($P>0.05$). For the total sample examined, males were highly significantly affected by trauma than females (Z - test = 3.243). Furthermore, the prevalence of traumatized students was highly significantly associated with gender ($P<0.01$). Table (3) illustrates the distribution of traumatized students according to the types of the dental injuries. The most common type of dental injury was found to be simple enamel fractures (Class1) (39.3%) .

Table (4) shows that, when the types of dental injury were studied according to the number of traumatized teeth, simple enamel fracture was the most prevalent type (48.5%).The type of the dental injury was found to be not associated with age and gender ($P>0.05$). All types of traumatic dental injuries were most common in males than females.

Table (5) reveals that traumatized students with class II division 1 malocclusion were the most common (50.2%) and class III malocclusion (4%) were the least common. Students at the age of 14 years have a higher prevalence of dental trauma (45.6%) than other age groups. Females recorded a lower prevalence of dental trauma in all types of occlusion . Figure (1) shows that type of occlusion was found to be associated with number of traumatized teeth ($X^2= 18.660$, d.f= 9, $P<0.05$). Table (6) shows the distribution of students with traumatized teeth in relation to the number of injured teeth, and it illustrates that single tooth trauma was the most common type (71.3%) . Statistically, no association was found between number of traumatized teeth and age ($P>0.05$). The maxillary central incisors (76.5%) were the most teeth affected by dental trauma while the mandibular canines (0.5%) were the least affected (Table 7).

Table 1: Distribution of students by age and gender.

Age	*Gender*	*No.*	*%*
13	Males	500	13.0
	Females	474	12.3
	Both	974	25.3
14	Males	602	15.6
	Females	538	14.0
	Both	1140	29.6
15	Males	933	24.2
	Females	808	21.0
	Both	1741	45.2
Total	Males	2035	52.8
	Females	1820	47.2
	Both	3855	100

Table 2: Distribution of students with and without traumatized teeth by age and gender.

Age	Gender	Without trauma	With trauma	X^2			
		No.	%	No.	%	Total	N.S
13	Males	450	90.0	50	10.0	500	
	Females	450	94.9	24	5.1	474	
	Both	900	92.4	74	7.6	974	
14	Males	550	91.4	52	8.6	602	
	Females	500	92.9	38	7.1	538	
	Both	1050	92.1	90	7.9	1140	
15	Males	864	92.6	69	7.4	933	
	Females	766	94.8	42	5.2	808	
	Both	1630	93.6	111	6.4	1741	
Total	Males	1864	91.6	171	8.4	2035	X^2= 10.484 d.f=1 P<0.01
	Females	1716	94.4	104	5.7	1820	
	Both	3580	92.9	275	7.1	3855	

Table 3: Distribution of traumatized students according to the types of the dental injuries by gender

Type of trauma	Male	Female	Total			
	No.	%	No.	%	No.	%
1	68	39.7	40	38.5	108	39.3
2	59	34.5	43	41.3	102	37.1
3	16	9.6	7	6.7	23	8.4
4	1	0.6	0	0.0	1	0.4
6	11	6.4	10	9.6	21	7.6
7	4	2.3	0	0.0	4	1.5
8	1	0.6	0	0.0	1	0.4
9	1	0.6	0	0.0	1	0.4
10	10	5.8	4	3.8	14	5.1
Total	171	8.4	104	5.7	275	7.1

Table 4: Distribution of traumatized teeth according to the types of the dental trauma by age

Age	13	14	15	Total				
Type of trauma	No.	%	No.	%	No.	%	No.	%
1	43	44.3	65	50.8	80	49.1	188	48.5
2	33	34.0	42	32.8	45	27.6	120	30.9
3	8	8.3	9	7.1	15	9.2	32	8.3
4	0	0.0	0	0.0	1	0.6	1	0.3
6	6	6.2	7	5.5	11	6.7	24	6.2
7	2	2.1	0	0.0	4	2.4	6	1.5
8	1	1.1	0	0.0	0	0.0	1	0.3
9	0	0.0	0	0.0	1	0.6	1	0.3
10	4	4.1	5	3.9	6	3.7	15	3.8
Total	97	25	128	33	163	42	388	100

Table (5):Distribution of traumatized students according to type of occlusion by age and gender.

Age	Type of occlusion								Total
	Class I		Class II div.1		Class II div.2		Class III		
	No.	%	No.	%	No.	%	No.	%	
13	22	29.7	48	64.9	3	4.1	1	1.4	74
14	42	46.7	41	45.6	5	5.6	2	2.2	90
15	42	37.8	49	44.1	12	10.8	8	7.2	111
Gender									
Males	56	32.7	95	55.6	14	8.2	6	3.5	171
Females	50	48.1	43	41.3	6	5.8	5	4.8	104
Both	106	38.5	138	50.2	20	7.3	11	4.0	275

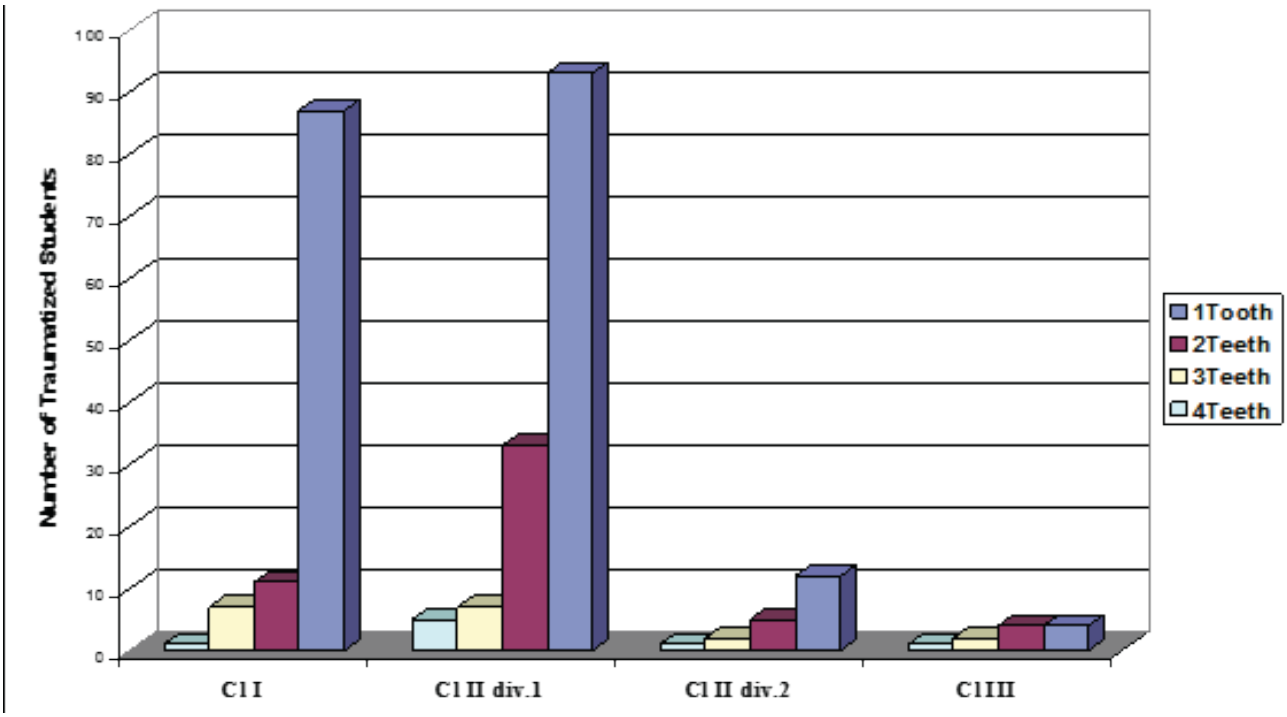

Figure 1: Distribution of traumatized students according to type of occlusion by number of traumatized teeth.

Table (6): Distribution of students according to the number of traumatized teeth by age.

Age	Number of traumatized teeth								Total	X2
	One tooth		Two teeth		Three teeth		Four teeth			
	No.	%	No.	%	No.	%	No.	%		
13	56	75.7	15	20.3	2	2.7	1	1.4	74	
14	65	72.2	15	16.7	8	8.9	2	2.2	90	N.S
15	75	67.6	23	20.7	8	7.2	5	4.5	111	
Total	196	71.3	53	19.3	18	6.6	8	2.9	275	

Table 7: Distribution of traumatized teeth according to the type of tooth.

Position	Central		Lateral		Canine		Total	
	No.	%	No.	%	No.	%	No.	%
Maxillary	297	76.5	25	6.5	13	3.3	335	86.3
Mandibular	39	10	11	2.8	3	0.5	53	13.7
Total	336	86.5	36	9.2	16	4.1	388	100

DISCUSSION

Since this study was the first one conducted in Hilla city, so the data collected could be used as a base line data. The prevalence of dental trauma in this cross-sectional study was recorded to be (7.1%), this

prevalence was higher than that recorded by many studies on permanent dentition [16, 19, 20], while it was lower than the prevalence of studies on permanent anterior teeth that reported by many authors[6,10, 21].

The causes responsible for this low prevalence of dental injury in comparison with other studies are the differences in geographical area, sampling technique and sample size. On the other hand, although the sample size in the present study was smaller than the Iraqi study that previously dealt with this subject[16], the prevalence of traumatic dental injury was higher. This reveals the increasing rate of traumatic dental injury among those age groups in Hilla city and this could be explained by the fact that the attitude and knowledge regarding treatment of injured teeth was not impressive or it could be explained by the fact that teenagers and adolescents have accumulative dental treatment needs[6].

Regarding gender variation in relation to traumatic dental injury, this study illustrated that males (8.4%) were highly significantly affected by dental trauma compared to females (5.7%). This result was in agreement with many epidemiological studies[6, 8,10, 16,21, 20]. Results also showed that males were more affected than females in all age groups; the reasons for this gender difference may be due to the fact that males tend to be more active and participate in strenuous activities with higher trauma risk, such as contact sports and more aggressive types of playing. Whereas females tend to be more mature in their behavior and may be more concerned about their physical appearance and aesthetics which possibly reflects the play characteristics of females toward more stability and calmness than males[10, 22], as well as one can assume that mothers were more concerned about the esthetic of their female daughters than males, seeking dental treatment quickly after dental injuries.

The results of this study also show that the prevalence of traumatized subjects was not associated with age. This result is in agreement with previous studies[7,16], while it is in disagreement with others [6, 8,10]. This may be attributed to the limited age groups involved in this study or it could be explained by the finding reached by the Iraqi study which concluded that the prevalence of traumatized children was increased until age 10 years old then decrease steadily [10], because subjects become more mature as they grow older and become sensitive from their false behavior as well as tend to listen to their teacher and parent's advice[23].

The finding of the present study concerning the type of dental injury was in agreement with other epidemiological studies which concluded that, simple enamel fracture was the most common type of dental injury followed by enamel and dentine fracture without pulp exposure then enamel and dentine with pulp exposure[10,15]. The high percentages of simple enamel fracture and enamel-dentine fracture compared to other types of dental injuries could be explained by the fact that these two types of injuries may not provoke the parents for immediate dental treatment as the cases with other injuries. On the other hand the low percentage of other types of dental injury like luxation, intrusion ,extrusion and avulsion because these types of injuries were more frequent in the primary dentitions due to the resiliency of supporting alveolar bone, small crown and their short roots favor their dislocation rather than their fracture [24], while in permanent dentitions, as with aging, the resiliency of bone decrease and the impact of exposure will be on the tooth itself [25].

However, sever type of trauma such as avulsed teeth were found to be more in males compared to females, this may be due to that the majority of the avulsed teeth occurred in the boys as a result of blow on the face during fight and contact sports [6].

A higher prevalence of dental trauma was recorded in class II malocclusion particularly division 1 (50.2%) compared to other types of occlusion. This finding was in agreement with other studies[8,10, 16]. The explanation of this result is that in cases with normal occlusion, the energy of the trauma is decreased by the larger contact area, the incisal contact of the upper and lower teeth while in cases with class II malocclusion, the lack of incisal contact and the location of this contact in the cervical part of the upper incisors, all increases the risk of being traumatized in children with class II malocclusion[26]. Results also revealed that the type of occlusion was associated with the number of traumatized teeth and this is in disagreement with other study [16]. This may be due to combination of both; anatomical risk factors

and aggressive behavior of the examined subjects.

The present study reveals that single tooth trauma was the most common type (71.3%) while four teeth trauma (2.9%) was the least one. This result was in agreement with other previous studies[6, 10,16]. This result could be explained by that when one tooth or two teeth are traumatized the majority of the force of the impact is dispersed by the fractured tooth or teeth and no more teeth will be injured [16]. In addition, this study shows that the maxillary central incisors were the most common teeth affected by dental trauma and this was in agreement with many previous studies[6,7, 10,16,27] This may be explained by the fact that the prominent and vulnerable position of the maxillary incisors in the face was responsible for their more frequent involvement in fractures than the lower teeth[28].

In conclusion, data of the present study clearly shows the need for dental health education of the children and their parents,so preventive programs are needed to improve the dental health of Iraqi children.

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Immunohistochemical Distribution of Myofibroblasts in Oral Squamous Cell Carcinoma, Verrucous Carcinoma and Oral Epithelial Dysplasia

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ABSTRACT

Background: Squamous cell carcinoma (SCC) is the most frequent type of oral malignancy that exhibits certain histological variations and is associated with a high mortality rate .Verrucous carcinoma (VC) is considered to be an uncommon exophytic distinctive low-grade well differentiated pathological variant of OSCC. Several studies have shown that the microenvironment or stroma of neoplastic tissues plays an active role in tumor progression. Concurrent with the conversion of non-diseased epithelial tissue to pre-cancerous epithelium to carcinoma, the stroma also changes from normal to primed (activated or tumor associated).

Objective: The aim of this study was to compare the distribution of myofibroblasts in normal oral mucosa, oral epithelial dysplasia, verrucous carcinoma, and different histological grades of OSCC.

Materials and methods: Twenty four formalin –fixed, paraffin -embedded tissue blocks (10 cases oral squamous cell carcinoma, 8 cases oral epithelial dysplasia and 6 cases verrucous carcinoma) were included in this study. An immunohistochemical analysis was performed using anti alpha - smooth muscle actin (a- SMA) monoclonal antibody.

Results: All cases of OSCC, intraoral dysplasia and verruous carcinoma, and normal oral mucosa showed positive reaction of actin in the stromal smooth muscles surrounding blood and lymphatic vessels. All OSCCs demonstrated stromal immunostaining for a-SMA with different scores indicating the presence of myofibroblast. There were no myofibroblasts in the stroma of normal mucosa, epithelial dysplasia or verrucuos carcinoma samples indicated by negative a-SMA expression in them.

Conclusion: The lack of myofibroblasts in normal, dysplastic oral epithelium and VC and their appearance in OSCC, suggests that the genetically altered epithelium (carcinomatous epithelium), besides the invasive behaviour of OSCC may have an inductive effect on the adjacent stroma to produce myofibroblasts.

Key words: Dysplasia,Verrucous Carcuinoma, Oral Squamous Carcinoma, a-SMA

INTRODUCTION

Squamous cell carcinoma (SCC) is the most common head and neck cancer and holds the sixth position worldwide and it is the frequent type of oral malignancy that exhibits certain histological variations and is associated with a high mortality rate [1&2]. Verrucous carcinoma (VC) is considered to be an uncommon exophytic distinctive low-grade well differentiated pathological variant of OSCC [3].

Cancer is a multifactorial, multifaceted, and multimechanistic disease requiring a multidimensional approach for its diagnosis, treatment, and prevention [4]. Over the past decade, several studies have shown that the microenvironment or stroma of neoplastic tissues plays an active role in tumor progression. Concurrent with the conversion of non-diseased epithelial tissue to pre-cancerous epithelium to carcinoma, the stroma also changes from normal to primed (to activated or tumor associated) [5, 6].

Remodeling of the extracellular matrix or stromagenesis' is initiated by tumor cells, while stromal cells are responsible for the organization of this process [7]. Fibroblasts are considered as one of the most important mesenchymal cells involved in tumor progression [5, 7].

Trans-differentiation of fibroblasts to myofibroblasts is a crucial and early event in tumorigenesis, which is mediated by growth factors and cytokines expressed by tumor cells [5, 6, 7, 8]. Myofibroblasts secrete numerous growth factors and inflammatory mediators that stimulate epithelial cell proliferation [9]. Therefore, these cellular elements play an important role in tumoral invasion and use a combination of different factors in the course of neoplastic growth and development. An invasion promoting role of myofibroblasts has been shown in numerous aggressive and malignant lesions [10, 11, 12, 13, 14]. In addition, decreased CD34+ fibrocytes along with an increase in smooth muscle actin (SMA)-positive myofibroblasts has been observed in invasive oral squamous cell carcinomas (OSCCs) [15]. However, the number of studies evaluating the role of myofibroblasts in OSCC remains limited.

The aim of this study was to compare the distribution of myofibroblasts in normal oral mucosa, oral epithelial dysplasia, verrucous carcinoma, and different histological grades of OSCC.

MATERIALS AND METHODS

The study sample consisted of twenty four formalin–fixed, paraffin-embedded tissue blocks (10 cases were diagnosed as oral squamous cell carcinoma, 8 cases were diagnosed as oral epithelial dysplasia and 6 cases were diagnosed as verrucous carcinoma). The blocks were obtained from the archives of the Department of Oral Pathology/ College of Dentistry / Baghdad University.

Normal oral mucosa was obtained from patients undergoing tooth extraction for orthodontic purposes who had no signs of gingival inflammation or periodontal disease.

Histopathological and immunohistochemical evaluation

The studied cases were reviewed for histopathological reassessment and the suitable cases were selected (graded as well, moderately, poorly differentiated for OSCC and mild, moderate and sever for oral epithelial dysplasia). Data concerning the clinicopathological parameters were obtained from the associated surgical reports.

From each tissue block a 4µm section was obtained for immunohistochemical analysis using anti a- SMA monoclonal antibody (US Biological/ Catalogue No A0760-26).

Negative and positive control slides were included in each IHC run. Colon tissue presented acute appendicitis was used as a positive control for SMA, according to the manufacturer (Fig.1).

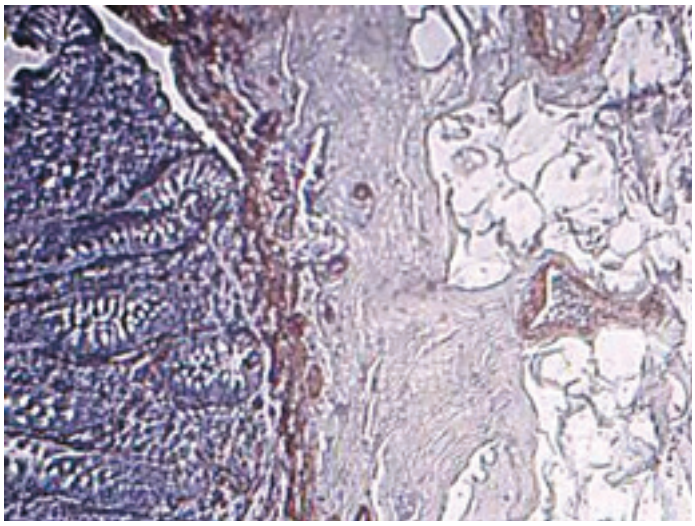

Figure 1: Positive actin immunostaining in acute appendicitis (positive control) (x400)

Slides were baked in hot air oven at 65°C overnight. Sections were sequentially dewaxed and rehydrated through a series of xylene, graded alcohol and water immersion steps. Then endogenous peroxidase activity was blocked followed by blocking the non-specific staining. Anti SMA monoclonal antibody (100 ml) at a dilution (1-200) was applied for each section. The samples were then incubated at 4°C overnight in a humid chamber. After washing with PBS, secondary Ab was applied to the sections, incubated and rinsed with a stream of PBS. Primary Ab was visualized with DAB chromogen. Sections were counterstained with Mayer's hematoxyline for 30 seconds, dehydrated and mounted.

Immunostaining was scored, according to the extent of stromal positivity, as follows (16)

0: Negative or non-reactive.
1- +: Scattered spotty staining.
2- ++: 25% positive cells.
3- +++: 25-50% positive cells.
4- ++++: More than 50% positive cells

RESULTS

A total of 24 cases enrolled in this study, of which 10 cases were oral squamous cell carcinoma, 3 of them were females and 7 were males with an age range from (35-75) years. Four of the cases were located on the tongue, 3 in the mandibular area, 2 at the maxilla and one case on the buccal mucosa. Regarding the histological grading of the OSCC cases 6 of them were diagnosed as well differentiated SCC, 3 were moderately differentiated SCC and only one case was poorly differentiated SCC.

From the total sample 6 cases were verrucous carcinoma, four females and two males, with an age range from (50-70) years. All the cases were located on the mucous membrane of the buccal mucosa and appeared clinically as cauliflower, gray to whitish raised lesions.

Oral epithelial dysplasia represented in 8 cases, three males and five females with an age range from (34-60) years, located at different sites through the mucous membrane of the oral cavity including the buccal mucosa, floor of the mouth and tongue. Intraepithelial dysplasias were recorded as mild (3 cases), moderate (4 cases), and severe (one case).

Blood vessels present within the connective tissue of the immunostained sections served as positive internal control. All cases of SCC, intraoral dysplasia and verruous carcinoma, and normal oral mucosa showed positive reaction of actin in the stromal smooth muscles surrounding blood and lymphatic vessels (Fig.2,3, 4&5).

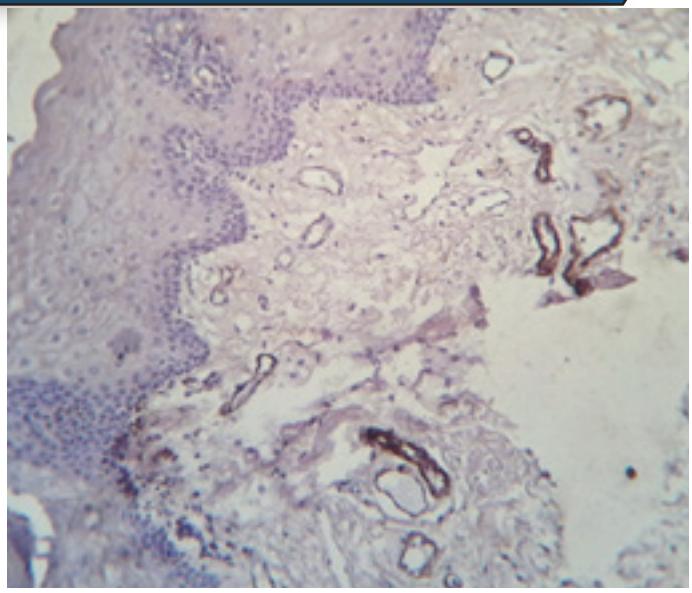

Figure2: Positive actin immunostaining of the smooth muscles surrounding the blood vessels and lymphatic vessels in normal oral mucosa (x400)

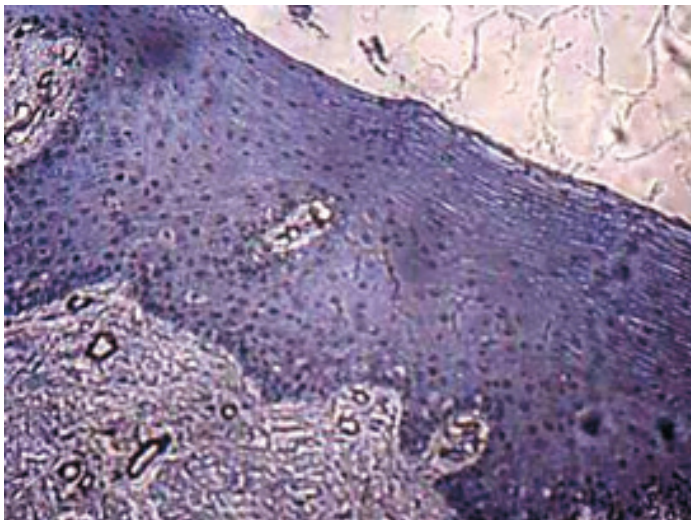

Figure 3: Positive actin immunostaining of the smooth muscles surrounding the blood vessels and lymphatic vessels in dysplasia (x200)

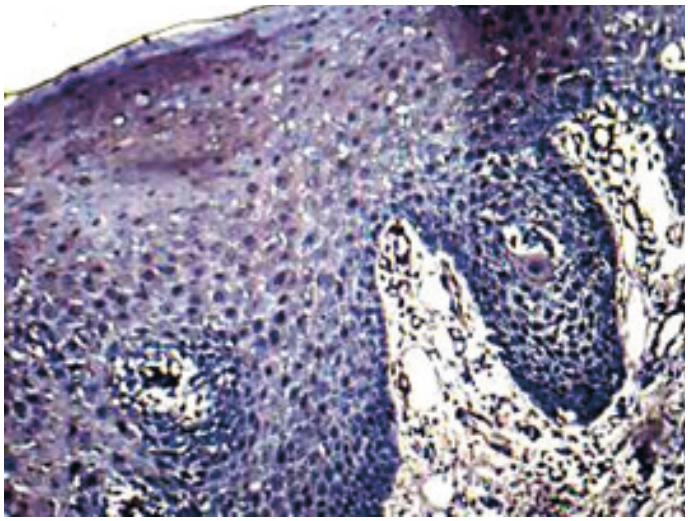

Figure4: Positive actin immunostaining of the smooth muscles surrounding the blood vessels and lymphatic vessels in VC (x200)

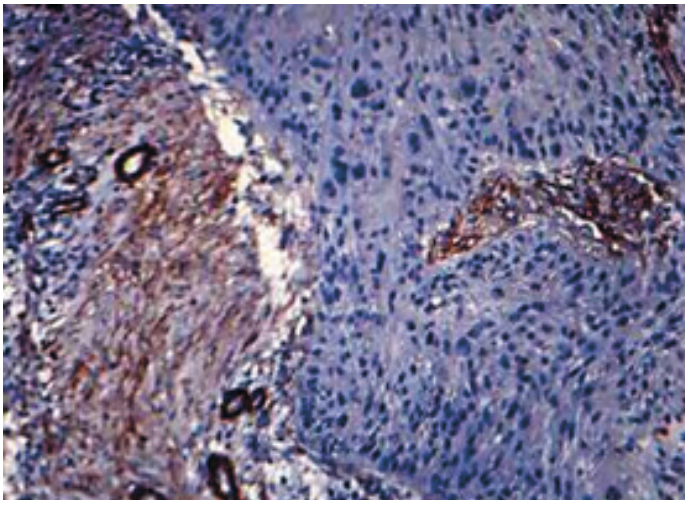

Figure5: Positive actin immunostaining of the smooth muscles surrounding the blood vessels and lymphatic vessels as well as the stroma in well differentiated SCC (x200)

All OSCCs demonstrated stromal alpha-SMA immunostaining with different scores, indicating the presence of myofibroblasts (Fig.5&6). There were no myofibroblasts in the stroma of normal mucosa, epithelial dysplasia or verrucuos carcinoma samples indicated by negative a-SMA expression in them.

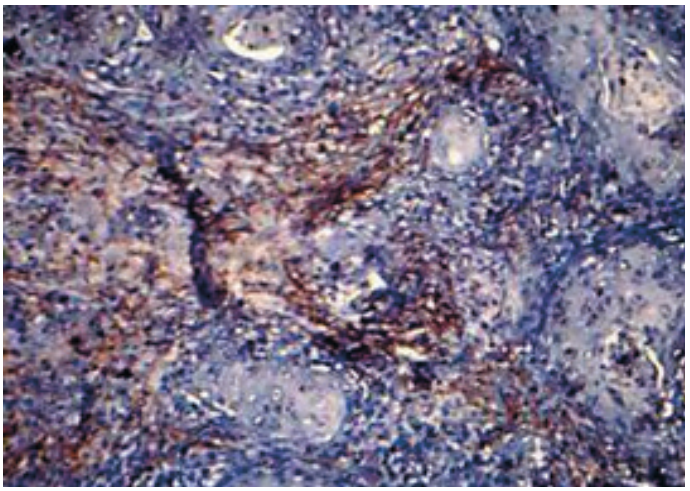

Figure 6: Positive brown stromal actin immunostaining in well differentiated SCC (x200)

Regarding the immunostaining of the tumor cell itself, Out of ten cases of OSCC, only two cases showed (score 1) nuclear actin staining (Fig.7).

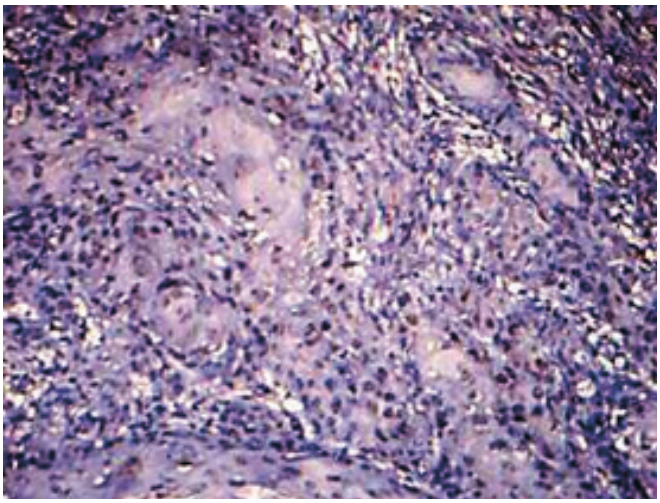

Figure7: Positive nuclear actin immunostaining of tumor cells (well differentiated SCC) (x200)

Out of 8 cases of verrucous carcinoma, 4 cases showed positive immunoreactivity, which appeared as nuclear staining. Two out of these four cases had (score 1) and two had (score 3) actin positive immunostaining (Fig.8).

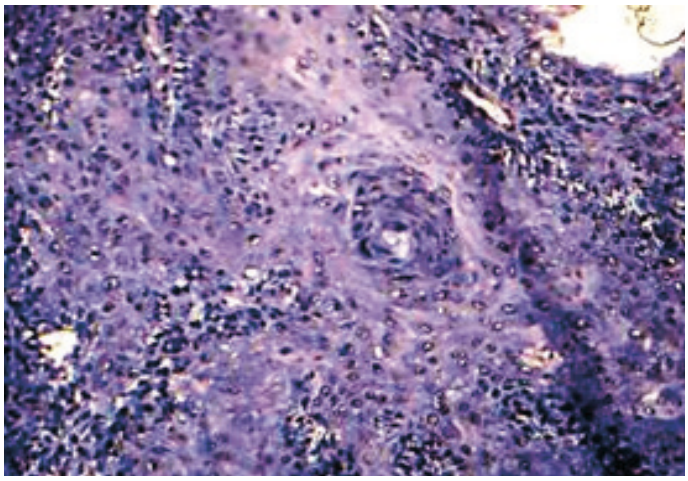

Figure 8: Positive nuclear actin immunostaining of tumor cells in VC (x400)

Out of 6 cases of epithelial dysplasia, three cases showed positive nuclear immunoreactivity in dysplastic cells with (score 2), while the adjacent intact or normal basal cells showed negative reaction (Fig. 9&10).

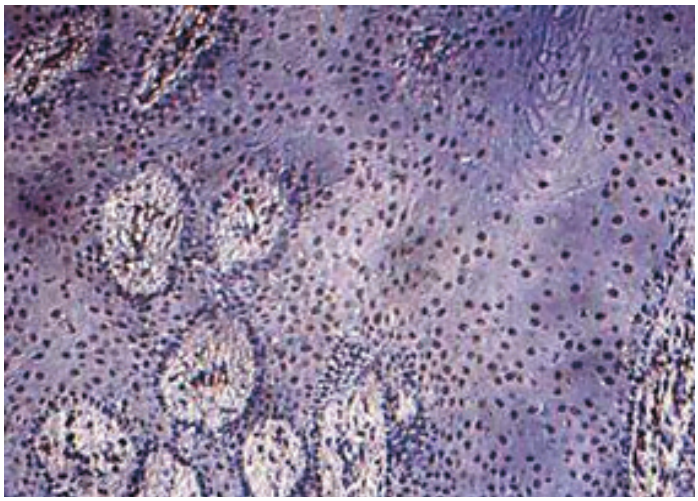

Figure 9: Positive nuclear actin immunostaining of dysplastic cells(x200)

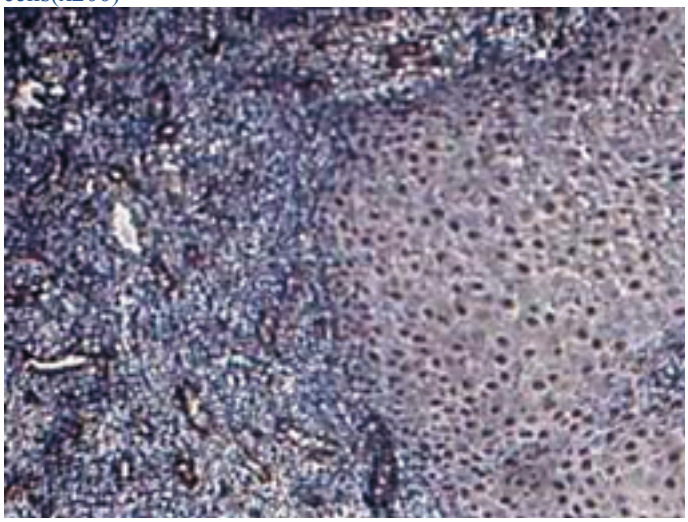

Figure10: Positive actin immunostaining of dysplastic cells, vascular and lymphatic smooth muscles in dysplasia(x400)

DISCUSSION:

It is assumed that carcinogenesis and tumor progression result from a defective response of epithelium and lamina propria due to genetic and epigenetic factors [17]. Several studies have confirmed the important role of the carcinomatous stroma in tumorigenesis, invasion and metastasis [5, 7, 8]. However, the exact mechanism by which different stromal cell types such as myofibroblasts can influence neoplastic cells remains unclear. The altered epithelial cells of SCC would not be solely responsible for carcinogenesis, and different stromal factors participate in its development via communication with the epithelial elements [17]. Transdifferentiation of fibroblasts to myofibroblasts is considered an important event that occurs in the stroma of several invasive carcinomas [10, 11, 14, 18]. According to the results obtained in this study, myofibroblasts were demonstrated in OSCC compared to normal, dysplastic epithelium, and verroucus carcinoma which were devoid of myofibroblasts. These findings are in agreement with those reported by Zidar *et al*. (2002) who also found a lack of myofibroblasts in normal and dysplastic laryngeal epithelium. The presence of myofibroblasts in dysplastic and carcinomatous oral epithelium has not been extensively investigated.

In studies that evaluated the transdifferentiation of fibroblasts to myofibroblasts in OSCC [19, 20, 21, 22], in two of them, the non-neoplastic epithelium adjacent to invasive SCCs was considered as normal tissue and both studies failed to demonstrate myofibroblasts in the approximal connective tissue,while these investigations showed an increased amount of myofibroblasts in the stroma of SCCs, which is in accordance with the results obtained in this study. None of the two studies had included oral epithelial dysplasia in their samples [19, 21].Another study conducted by Lewis *et al*. [22] demonstrated the presence of myofibroblasts in the vicinity of invasive SCC but not in benign mucosal polyps. These cells were also absent in the stroma distant from carcinomatous epithelial islands. Dysplasia was not included in their study sample. Kellermann *et al*. (2007) in a correspondence article reported the prognostic significance of myofibroblasts in SCC of the tongue, normal controls and premalignant leukoplakias with histological dysplasia. Similar to the current study, no myofibroblasts were found in the stroma of normal mucosa and epithelial dysplasia; however they were detected at the invasive front of the SCCs. It is noteworthy that the increase in myofibroblasts found in SCCs may be due to an inducing effect of the carcinomatous component. Epithelial – stromal interactions, different growth factors released by malignant epithelial cells or numerous other

processes may be responsible for the appearance of myofibroblasts.

In this study, the three histological grades showed the presence of myofibroblasts, similar to the finding of Kellermann *et al*. (2007). These findings may suggest that the transdifferentiation of myofibroblasts is induced somewhere in the invasive stage of SCC, and further loss of tumoral differentiation (increased grade) would not affect the number of these cells. According to the tissue organization field theory, cells are normally in a proliferative state and do not tend to be quiescent. Thus mutated epithelial/stromal cells and disturbed stromal – epithelial interactions may be equally responsible for the induction of carcinogenesis [5, 23], emphasizing the importance of the neoplastic microenvironment in oncogenesis.

The nuclear actin immunostaining of the dysplastic and neoplastic epithelial cells observed in this study may reflect its inactive, non-functioning role (prosynthetic state) in these cells since actin expresseion is cytoplasmic and it stains only smooth muscle cells in vessel walls, gut wall and myometrium, myoepithlial cells in breast and salivary glands as well as it reacts with tumor cells arising from smooth muscles and myoepithelial cells (according to the manufacturer's data sheet)

Statistical evaluation was not performed for the different groups in this study due to the small number of cases.

Additional investigations on these myofibroblasts in different stages of carcinogenesis may help to clarify how and to what extent these cells contribute to carcinogenesis.

In summary, considering the lack of myofibroblasts in normal, dysplastic oral epithelium and VC and their appearance in OSCC, it seems that the genetically altered epithelium (carcinomatous epithelium), besides the invasive behaviour of OSCC may have an inductive effect on the adjacent stroma to produce myofibroblasts. However, more sophisticated techniques are suggested to further clarify the exact mechanism by which these important cellular elements exert their effects on stromal and epithelial tissue compartments.

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Evaluation of the Effects of Rheumatoid Arthritis on the Hard and Soft Tissue Components of the Temporomandibular Joint by Using Magnetic Resonance Imaging

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ABSTRACT

Background : Magnetic resonance imaging (MRI) has been used to visualize the destructive effect of the rheumatoid arthritis (RA) within the body joints , while Temporomandibular joint is often to be neglected.

Aim of the study: to observe the hard and soft tissue changes as well as the clinical involvement that may affect the TMJ in patients with longstanding RA.

Patients and methods: 42 patients (84 TMJ'S), with mean age of (40.6 years) ranged from (28 to 63) years were divided into 2 groups; study (30) and control (12), all study group subjects consisted of patients with confirmed RA according to the criteria of American College Of Rheumatology (1987).Both groups had been examined clinically (at Al-Mustansiriya University/College of Dentistry) and with MRI (at the MRI unit at Al-Kadhmyia Teaching Hospital) in both sagital and coronal planes (open and close mouth) by the use of proton density and T2 weighted protocols.

Results : The clinical involvement was present within (73.3%) of the study sample as the joint's sounds were the predominant feature (80%) , masticatory muscle tenderness tenderness 70% , pain during function 58% ,morning stiffness 36.6% , deviation 43.3% while open bite was present in two cases (6.6%) , 33.3% of the RA patients had at least 3 clinical involvements , 26.6 % had at least 2 clinical involvement, uni-lateral involvement was present in 30% of RA patients, 5 subjects had only right side involvement and 4 patients had only left side involvement while bilateral involvement was present in 50% of RA patients. The mouth opening was significantly lowered (P<0.01) when compared with the control group.MRI findings were present in 80% of the study sample which led to a significant difference statistically when compared with the control group, the most common finding was the condylar head erosion (CHE), complete condylar destruction (score 4) was found in 2 RA patients, internal derangement 73.3%, meniscus perforation 73%, joint effusion 70%, increased joint space 66.6%, and osteophytes formation 60%, unilateral involvement was present in 53.3%, 5 subjects had right involvement only, and 7 subjects had left side involvement, while bilateral involvement was present in 46.7% .

Key Words: Temporomandibular Joint, Rheumatoid Athritis , Magnatic Resonance Imaging , Condylar Head Erosion.

INTRODUCTION

Rheumatoid arthritis is a chronic inflammatory disease characterized by joint swelling, joint tenderness, and destruction of synovial joints, leading to severe disability and premature mortality[(1)].

This inflammatory response particularly affects small joints of the upper and lower extremities including TMJ and it often leads to the deterioration and eventual destruction of articular cartilage and juxta-articular bone, as well as to an inflammatory process surrounding tendons, all of which frequently result in deformities of the affected joints[(7)].

Temporomandibular joints afflicted with RA may produce pain, joint stiffness, difficulties in opening the mouth, and open bite. In severe cases of temporomandibular joint disorders, masticatory movement may be hampered [(2)].

Despite the superior resolution of CT and limited visualization of cortical bone by MRI, most osseous pathology is accurately depicted. Intra-articular abnormalities are readily visible on MRI images, providing further information not available with other imaging modalities [(3)], plus direct visualization of the disk afforded by MRI is a distinct advantage over arthrography.

PATIENTS AND METHODS

This research was carried out on a sample of 42 patients (14 males and 28 female) 84 TMJ's 71.5% of them were previously diagnosed with rheumatoid arthritis according to the revised criteria of ACR (American College of Rheumatology) in 2010 and they were referred from the Rheumatology Unit in Al-kadhmyia Teaching Hospital (all the patients has a medical record within the mentioned hospital) with no other systemic diseases which might have affected the MRI findings .They were divided into two groups (study and control) both groups were clinically evaluated on a dental chair at the Postgraduate Clinic in Al-Mustansirya University/College of Dentistry -Oral Medicine Department regarding the mouth opening ,joints sounds, muscle tenderness, morning stiffness, feeling of pain,pain during movement, and deviation , then the two groups were again examined

radiographicaly by MRI at Al-Kadhmyia Teaching Hospital / MRI Unit done by using proton density T2 weighted protocols in both sagital and coronal plane with bilateral 6x8 cm surface coil placed over the patient's head , each subject was examined -regarding MRI- in two positions , open and the closed mouth.

RESULTS

THE CLINICAL FINDINGS

The clinical involvement was present within 73.3% (see table-1-) of the study group subjects It was found that the mean of the non-assisted mouth opening in the RA group was 3.913 mm while in control group 4.783 mm. The difference was statistically highly significant (P<0.05) (see table-2-), while the most important clinical finding was that the joint sounds 80% , masticatory muscle tenderness 70% , pain during function 58% ,morning stiffness 36.6% , deviation 43.3% while open bite was present in two cases (6.6%),(see table -3-) again all the results were highly significant when compared to the control group (P<0.05) , 33.3% of the RA patients had at least 3 clinical involvements , 26.6 % had at least 2 clinical involvement.

Table 1: Percentage of the clinical involvement within the study & control group

	Study Group Sum=60		Control Group Sum=24		Chi-Square	P-Value
	No.	%	No.	%		
Clinical Involvement	44	73.3	8	33.3	53.00	P<0.01*

Table 2: The mean of the non-assisted mouth opening in both study and control group

	No.	Mean	SD	T-Test	P-Value
Study	30	3.913	0.331	5.492	P<0.01*
Control	12	4.783	0.483		

Table 3: clinical involvement within the study group compared to the control group

	Study group Sum=30		Control group Sum=12		Chi-square	P-value
	No.	%	No.	%		
Normal muscle tone	9	30	10	83.3	19.0	P<0.01*
Masticatory muscle tenderness	21	70	2	16.7	23.0	
Normal joint sounds	12	20	18	75	27.23	P<0.01*
Joint Sounds	48	80	6	25	54.1	
Normal muscle tone	9	30	10	83.3	19.0	P<0.01*
Masticatory muscle tenderness	21	70	2	16.7	23.0	
Patients without morning stiffness	11	36.7	10	83.3	21.0	P<0.01*
Morning stiffness	19	63.3	2	16.7	22.0	
No pain on palpation	18	30	18	75	15.39	P<0.01*
Pain on palpation	42	70	6	25	48.2	
No Pain during movement	50	33.3	23	75	73.9	P<0.01*
Pain During movement	10	16.6	1	4.16	11.8	
Normal mouth opening without deviation	17	56.7	12	100	2.90	P<0.01*
Deviated mouth opening	13	43.3	0	0.0	43.4	
Normal occlusion	28	92.9	12	100	40.1	P<0.01*
Open bite	2	7.1	0	0	3.0	

uni-lateral involvement was present in 30% of RA patients, 5 subjects had only right side involvement and 4 patients had only left side involvement while bilateral involvement was present in 50% of RA patients. Although there was a difference regarding the involvement between the right and the left joint but statistically was considered as non-significant.

Table 4: clinical involvement in a RT. and LT. TMJ pattern

Clinical involvement	RT. joint	LT. joint	Chi square	P value	SIG
Pain on palpation of TMJ	20	22	0.903	0.311	NS
Joint sounds	5	4	1.63	0.075	NS
Pain during movement of the TMJ	5	5	0.38	0.38	NS
deviation	7	6	0.42	0.333	NS
Muscle tenderness	10	11	0.93	0.32	NS

Figure (2): Deviation during maximal mouth opening(to the left)

The MRI findings

MRI findings was present in 80% of the study sample which led to significant difference statistically when compared with the control group (P<0.05) (see table-5-), the most common finding was the condylar head erosion (CHE), complete condylar destruction (score 4) was found in 2 RA patients (see fig.1), internal derangement 73.3%, meniscus perforation 73%, joint effusion 70%, increased joint space 66.6%, and osteophytes formation 60%, again all findings were highly significant (p<0.05) when compared to the control group.(see table -6-) . Unilateral involvement was present in 53.3%, 5 subjects had right involvement only, and 7 subjects had left side involvement, while bilateral involvement was present in 46.7% . There was no statistical difference (non-significant) between the right and left TMJ's MRI findings involvement when compared together . (see table 7)

Table (5): percentage of the MRI findings involvement within the study and control groups

	Study group Sum=60		Control group Sum=24		Chi-square	P-value
	No.	%	No.	%		
MRI involvement	48	80	8	33.3	56.00	P<0.01*

Table (6) : MRI findings involvement findings in both study and control group compared to each other

	Study group		Control group		Chi-square	P-value
	No.	%	No.	%		
Normal disk position	16	26.7	16	66.7	32.0	P<0.01
Internal derangement	44	73.3	8	13.3	56.3	
Intact disk	16	26.6	16	66.6	22	P<0.01
Disk perforation	44	73.3	8	33.3	56.3	
No effusion	18	30	24	100	42	P<0.01
Effusion	42	70	0	0.00	43.4	
Normal joint space	20	33.3	16	66.7	28.8	P<0.01
Joint space increased	40	66.6	8	33.4	48.7	
No osteophytes formation	24	40	20	60	36.7	P<0.01
Osteophytes	36	60	4	40	40.6	

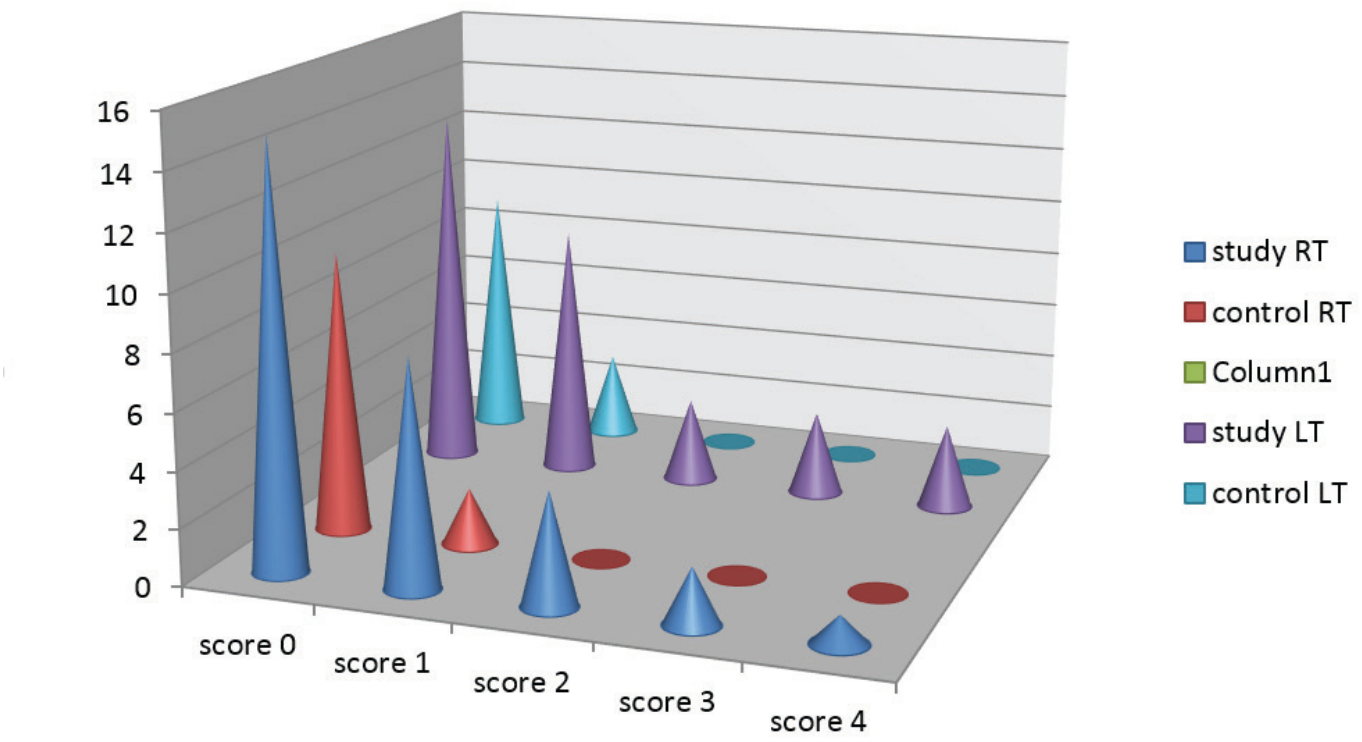

Figure 1: Condylar Head Erosion involvement in both study and control group (RT. & LT pattern)

Table 7: MRI findings involvement in a RT. LT. TMJ involvement

	RT. joint	*LT. joint*	*Chi square*	*P value*	*signal*
Increased joint space	22	18	1.82	0.311	NS
perforation	20	24	1.62	0.44	NS
Joint effusion	20	22	1.63	0.251	NS
Osteophytes	20	16	1.92	0.093	NS

DISCUSSION

The temporomandibular joint (TMJ) may be affected in many rheumatic diseases especially rheumatoid arthritis[7], but the mentioned joint is often neglected during studies and clinical practice In the current study among rheumatic diseases rheumatoid arthritis is the one to be investigated regarding it's role in the clinical and radiographic picture presentation of disability of the TMJ .

It was found that the incidence of RA was more in females than males and that was in agreement with other studies like (Lin YC, 2007)[6] and with (Lipisky 1998)[7]. The age range (45.6 years) ranged from (28 to 63) years and the duration of the disease was (20.6 years) and its effect upon RA subjects coincided with the criteria of RA according to British Society of Rheumatology ,2008.[3] ,and other articles[6,9].

The clinical involvement was present within (73.3%) of the study subjects while joint sounds was considered the most predominant feature and that was in agreement with other previous studies [5,6,9].

While the MRI findings involvement was present

within (80%) of the study group subjects, CHE was considered the most predominant feature and that was in agreement with other previous studies[11,12].

All the recorded clinical and MRI findings were in agreement with other previous studies[1.2.4.5.9.10], but in different percentages and that may be due to the selection of the sample regarding the age ,gender distributions,method used in the measurement, and the type of radiographic aid.

CONCLUSION

MRI is an excellent diagnostic aid of the TMJ in patients with RA The clinical and radiographic findings in the RA group were much more than that in the control group, but the changes are not always bilateral, a significant correlation was found between the extent of MRI findings and the duration RA disease.

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Oral Mucositis in Children Suffering from Acute Lymphoblastic Leukaemia

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ABSTRACT
Background: Oral mucositis is the most commonly reported side effect observed in neoplastic patients treated with chemotherapy and radiotherapy of the head and neck region as well as in patients who have received a haematopoietic stem cell transplant. The aim of the study was to assess the oral mucosa status in children with acute lymphoblastic leukaemia (ALL) during antineoplastic therapy.
Material and methods: The clinical examination included 127 children aged 5-15 with ALL. The clinical examination was conducted using the dental diagnostic instrument. The condition of the oral mucosa was determined using the WHO scale for oral mucositis.
Results: In the first period of antineoplastic therapy the pathological lesions of the oral mucosa of the mucositis type were observed among the examined patients. The lesions had various levels of intensity. Pain was found to be the primary symptom of oral mucositis. In this study the following were observed: local erythema of the oral mucosa in 10%, ulcerative lesions in 5%.The remaining 85% patient who could not eat or drink because of pain and soreness.
Conclusion: Local treatment of oral mucositis with polyantibiotic-antifungal mixture, supporting antifungal systemic treatment, and improving the overall peripheral blood conditions in children suffering from acute lymphoblastic leukaemia improve the condition of the oral mucosa.
Key words: oral mucositis, acute lymphoblastic leukaemia (ALL).

INTRODUCTION
Pathological changes of the oral mucosa defined as oral mucositis are caused by cytotoxic effects of chemotherapy and local radiotherapy of the head and neck region. Oral mucositis symptoms are also observed in 40-100% of patients who have had stern cell transplantation. Oral inflammation caused by stomatotoxic chemotherapy is painful and restricts oral administration of drugs, also increasing the risk of infection of the intrinsic oral cavity flora. It is a serious problem, which results in decreased doses of administered drugs and may increase the cost of tumor treatment. General incidence of mucositis may differ and depends on the diagnosis and the patient's age, previous condition of the oral cavity, as well as the type, dose and frequency of administration of pharmacological medicines. WHO distinguishes five grades of oral mucositis severity (Table 1):

Table 1: WHO Classification of oral mucositis

Grade	Symtoms
0	no symptoms of oral mucositis
1	redness, erythema, soreness
2	erythema and ulceration, patient can swallow solid food
3	ulceration and erythema, patient cannot swallow solid food
4	ulceration and pseudomembrane formation of such severity that alimentation is not possible

Development of oral cavity inflammation defined as mucositis is claimed to be a complex pathological process, in which proinflammatory cytokines play an essential role. In a five-phase model of mucositis pathogenesis, the primary cause and trigger of the inflammatory process, is microvascular injury to quickly dividing basal epithelial cells during radiation and chemotherapy, which results in production and release of free oxygen radicals, which in turn activates cytokines, including tumor necrosis factor-alpha, produced mainly by macrophages and interleukin-1 and -6. Developing ulcers in the mucosa are a base for development of bacterial microflora leading to secondary infections. The fifth and last phase is healing, which is characterised by epithelial cell proliferation, tissue differentiation and recovery of epithelial integrity [1, 2].

Among patients treated according to the protocol for high risk patients, severe mucositis occurs in more than 60%. Half of those patients experience deterioration of the oral mucosa condition, which is so serious that it requires changes in the antitumor treatment and/or administration of parenteral analgesia. Observations reveal that oral mucositis occurs more often in children than in adults with a similar tumor disease. Oral inflammation is also more often observed in patients after bone morrow transplantation [2, 3, 4]

AIM OF THE STUDY
The aim of the study was to assess oral mucosa

in children suffering from acute lymphoblastic leukaemia during anti-tumor treatment.

MATERIAL AND METHODS

The study included 127 children aged from 5 to 15 suffering from acute lymphoblastic leukaemia (ALL) (Table2). All patients diagnosed by physicians (Table 3).

Table 2: Age and, gender distribution for (127) patients with ALL

Age	F	%	Males		Females	
			F	%	F	%
5-7	20	16	10	8	10	8
8-9	55	43	35	27	20	16
10-12	30	24	18	14	12	9
13-15	22	17	12	9	10	8
Total	127	100	75	58	52	32

Tabie 3: Methods of diagnosis for (127) patients with ALL

Categories	F	%
Core biopsy lymph node	40	31
Blood tests	20	16
Biochemical tests	15	12
Ultra sound abdomen	12	9
Bone marrow biopsy	40	31
Total	127	100

The study group collected from different areas in Iraq (Table 4).

Table 4 : Residence for (127) patients and place of hospital with ALL

Categories	F	%	Hospitals			
			W.T.H *		C.C.T.H **	
			F	%	F	%
Center	25	20	13	10.23	12	9.44
North	25	20	12	9.44	13	10.23
East	18	14	16	12.29	2	1.57
West	19	15	10	7.87	9	7.08
South	40	31	30	23.62	10	7.87
Total	127	100	81	63.77	46	36.22

*W.T.H: Walffer Teaching Hospital (Medical City)
**Central Child Teaching Hospital

In the study group, forty children had swollen lymph node, 15 fatigue and weakness, 12 complaining from recurrent infection, 10 had easy bruising, 30 bone and joint pain (Table5).

Table 5: Chief compliants for (127) patient with ALL

Categories	F	%
Swollen lymph node	40	31
Fatigue and weakness	15	12
Recurrent infection	12	9
Easy bruising	10	8
Bone and joint pain	30	24
Abdominal pain	20	16
Total	127	100

RESULTS

In our own study , lesions of the mucositis type were observed in ALL children in the period from 48 hours to 6 months, having various intensity and with periods without pathological lesions, which was related to the intensity of the chemotherapy. Mucosa opacity followed by redness usually occurred within 2-4 days from the treatment by (etopside, cytosar, zofran) (Table 6).

Table 6: Therapy 2 weeks (14 days)

days	grade									
	0		1		2		J		4	
	F	%	F	%	F	%	F	%	F	%
1	H	0	0	0	0	0	0	0	0	0
2	0	0	5	4	0	0	0	0	0	0
3	0	0	5	4	0	0	0	0	0	0
4	0	0	3	2.5	0	0	0	0	0	0
5	0	0	0	0	J	2.5	0	0	0	0
6	0	0	0	0	3	2.5	0	0	0	0
7	0	0	0	0	0	0	6	5	0	0
8	0	0	0	0	0	0	0	0	20	15.5
9	0	0	0	0	0	0	0	0	30	24
10	0	0	0	0	0	0	0	0	30	24
11	0	0	0	0	0	0	0	0	22	16.5
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0

The most severe lesions of the oral mucosa were observed after the first month of chemotherapy. Wounds and ulcers difficult to heal were related to blood parameters. It was observed that healing was faster, especially with regard to oral mucosa ulceration, when blood morphological parameters were improved. Lesions of the mucositis type were also dependent on the level of neutropenia. Each child with neutropenia also had fungal complications in the oral mucosa weeks from the implementation of treatment, and were mostly dependent on blood morphology and haematological therapy, as well as on the oral cavity hygiene prior to treatment. Lesions in oral mucosa were the most persistent in children with bone marrow aplasia (up to 3 weeks) and in children with neutropenia. Difficult healing was also observed following chemotherapy infusion.

DISCUSSION

Severe type of oral mucositis may be the cause of antitumor treatment postponement or modification, which results in decreased effect of the therapy [5, 6]. Most frequently, changes of the mucositis type are observed 2-4 days after administration of chemotherapy. Lesions usually develop on buccal and tongue mucosa, as well as on the lips. The average time of development of mucositis-like lesions and ulcers was about 10-16 days of chemotherapy.

Problems in the oral cavity occurred independently of the chemotherapy protocol [7, 8]. Patients with aplasia or neutropenia are especially exposed to dangerous fungal complications. Therefore, introduction of antifungal prevention in the form of 100 mg of fluconazole daily may significantly reduce occurrence of pathological changes [9, 10]. Proper function of bone marrow and improvement in blood morphology parameters lead to regression of changes in the oral mucosa [11].

According to Karolewska et al. (2004, 2008), problems of the oral mucositis type in children with leukaemia are related to a great extent to a reduced level of S-lgA, myeloperoxidase, salivary peroxidase and to almost half the level of the total protein in saliva in comparison to patients with acute leukaemia without symptoms of oral mucositis [12, 13]. The intensity of oral inflammation significantly depends on oral hygiene, which was confirmed by McGaw et al. (1985), who observed less intense and shorter symptoms of oral mucositis in subjects using mouthwash with chlorhexidine [14]. Studies conducted by Hameralak(2004) indicate a correlation between development of oral mucositis following intensive cytostatic treatment with alkaline increase in saliva pH in children with leukaemia. Irrigation of the oral cavity during chemotherapy with solution compatible with the saliva Ph of the child resulted in a reduced intensity of inflammatorynecrotic changes [15]. The authors, who had observed poor oral hygiene in children prior to bone marrow transplantation, included the patients in routine dental care in order to minimise the occurrence of complications and infections in the oral cavity. The procedure included teaching the children to brush their teeth and to clean them with dental floss, as well as fluoride varnish [16, 17].

An important problem related to oral mucositis is pain, which leads to poor nourishment and insufficient hydration of the patients and increases the risk of local infections, especially systemic ones, which may pose a threat to life. Complications in the oral cavity may also prolong treatment and increase its cost [18, 19, 20].

Among preparations able to decompose dental plaque and prevent development of a new one, chlorhexidine seems to be the most effective. Numerous authors confirm chlorhexidine efficacy in 0.1% or 0.12% solution in the treatment of oral inflammatory conditions [3, 7, 8, 14, 21]. Certain researchers, however, do not recommend chlorhexidine preparations for children, claiming that mouthwashes containing fluoride compounds or saline have comparable therapeutic effects. Especially chlorhexidine solutions 0.2% or 0.3% are not recommended for children with acute lymphoblastic leukaemia, due to their flavour and tendency to discoloration. According to some researchers, both chlorhexidine and benzydamine have a positive effect on reduction of oral mucositis during chemotherapy, but only in children over 6 years of age [22, 23, 24].

All physicians agree that the most important factor lowering the risk of oral complications is regular, at least twice a day, brushing of teeth, mouth washing and effective motivation of the patient to clean dental surfaces and oral tissues of the oral cavity. Some studies recommend that during chemotherapy, the toothbrush should be placed in a 2% chlorhexidine solution after each use, and thoroughly rinsed prior to use [23, 24, 25, 26, 27].

In conclusion: local treatment of oral mucositis with a polyantibiotic and antifungal mixture supported by antifungal general treatment and improvement in blood morphology in children suffering from acute lymphoblastic leukaemia improves the condition of the oral mucosa.

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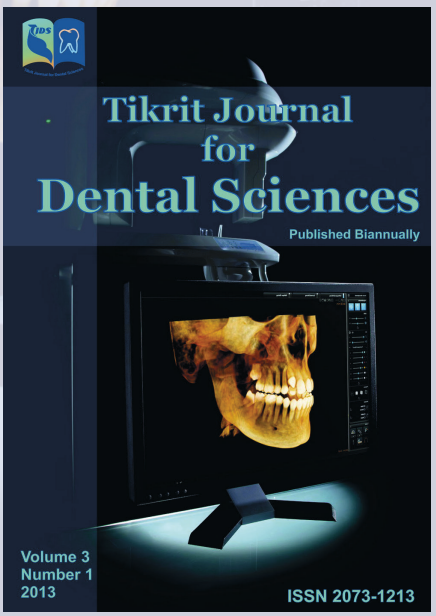

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Influence of Dental Implant Diameter on Implant Success

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ABSTRACT

Background: Missing teeth may result in a functional and cosmetic deficit and have traditionally been replaced with dentures or bridges. Dental implants offer an alternative; they are inserted into the jawbones and used to support dental prostheses.
Objective: To relate diameter of dental implants with implant success.

Patients and Methods: Implants with a root form, conical morphology and internal hex design, with SLA (sand blast large grid acid etch) surface treatment was used in this study. Two surgical procedures for submerged, bone level implants were used and 3 years follow up after prosthetic procedure was done. The diameter was classified as narrow, regular, or wide. The statistics were computed with Epi Info Version 6.

Results: In this study, 603 dental implants (312 maxillary and 291 mandibular) were placed in 285 patients (mean age, 45.23 years) involving 152 males and 133 females with 1.2: 1 male to female ratio. The 3 years survival rate for all 603 implants was 96.02%. The largest success rate was observed in wide diameter implants (99%), followed by regular diameter (97.6%) and then narrow diameter (94.11%). According to Epi Info Version 6 analysis the chi2= 7.6 and P- value= 0.03 associated with 3 years follow up.

Conclusion: According to this study there is a relationship of implant diameter with success rate.

Key words: Dental implant, implant diameter, implant success.

INTRODUCTION

The endosseus dental implant is a predictable technology to facilitate the prosthetic replacement of teeth. The focus of implant research is shifting from descriptions of clinical success to the identification of factors associated with failure[1]. New implant types varying in length, diameter, and shape have been continuously introduced[2].Choice of implant depends on the type of edentulism, the volume of residual bone, the amount of space available for the prosthetic reconstruction, the emergence profile, and the type of occlusion[3].

In general, the success of dental implants is related to the quality and quantity of local bones, implant design and surgical technique[4]. Implant diameter and length are accepted as key factors[5,6]. The posterior jaw, the main functional area of masticatory activity, is mainly composed of type III or IV bone, as classified by Lekholm *et al*.[7].The effects of implant diameter and length on stress distribution and implant stability in this region remain unclear. The optimal range of implant diameter and length is hard to define. It is necessary to understand the role of implant diameter and length in regions with poor quality bones[8].

Wide-diameter implants were introduced in 1993 with indications for their use associated with 1) poor bone quality, 2) inadequate bone height, and 3) immediate replacement of nonosseointegrated fixtures or fractured fixtures[9].

Stress and bone-implant contact influence the stability and survival of implants. A biological impediment to the use of wide-diameter implants can be a lower blood supply because of minimum existing cancellous bone[10]. Consequently, the total bone implant contact may be greater, compensating for the lack of height or bone density. However, wider implants are used when bone is scarce and the influence of diameter on bone-implant contact may not translate into a clinical advantage[11]. Decreasing the diameter of dental implant means increasing the risk for implant fracture because of reduced mechanical stability and increasing the risk for overload[12].

The aim of this study was to evaluate the effect dental implant diameter on success rate, for a period of 3 years, of patients treated by use of implants with different diameters.

PATIENTS AND METHODS

The study was based on a retrospective analysis of patients who received dental implants between May 2006 and May 2009 at Al-Elwiya Specialized Dental Center and Private Dental Implant Center. The study consisted of 603 dental implant placed in 285 patients .The inclusion criterion was dental implant placement in patients who had undergone two stage dental implant surgery. All implants analyzed in the study followed the protocol of 2 surgical procedures (submerged implants), and the implants were evaluated from the placement of the implants (first surgical phase) until 3 years after the procedure of reopening (second surgical phase) and prosthodontic stage.

Patients were not admitted to the study if any of the following exclusion criteria was present:

- The patients had missing or incomplete files.
- The patients had implants with external hex.
- The patients had implants other than Kentron K-one.
- The patients with age below 18 years.
- The patients had miniimplants

The implants used in this study were divided according to platform diameter into three groups: narrow implants (3.8mm), regular (4.5mm), and wide (5.5mm).

In this study a 2-stage surgery, submerge, and crestal level protocol used with root form design implants, titanium alloy grade 4 with SLA (Sand blast Large grid Acid etch) surface treatment from Geass Italian Company (Kentron K-one system) and we depend on the following criteria of success:

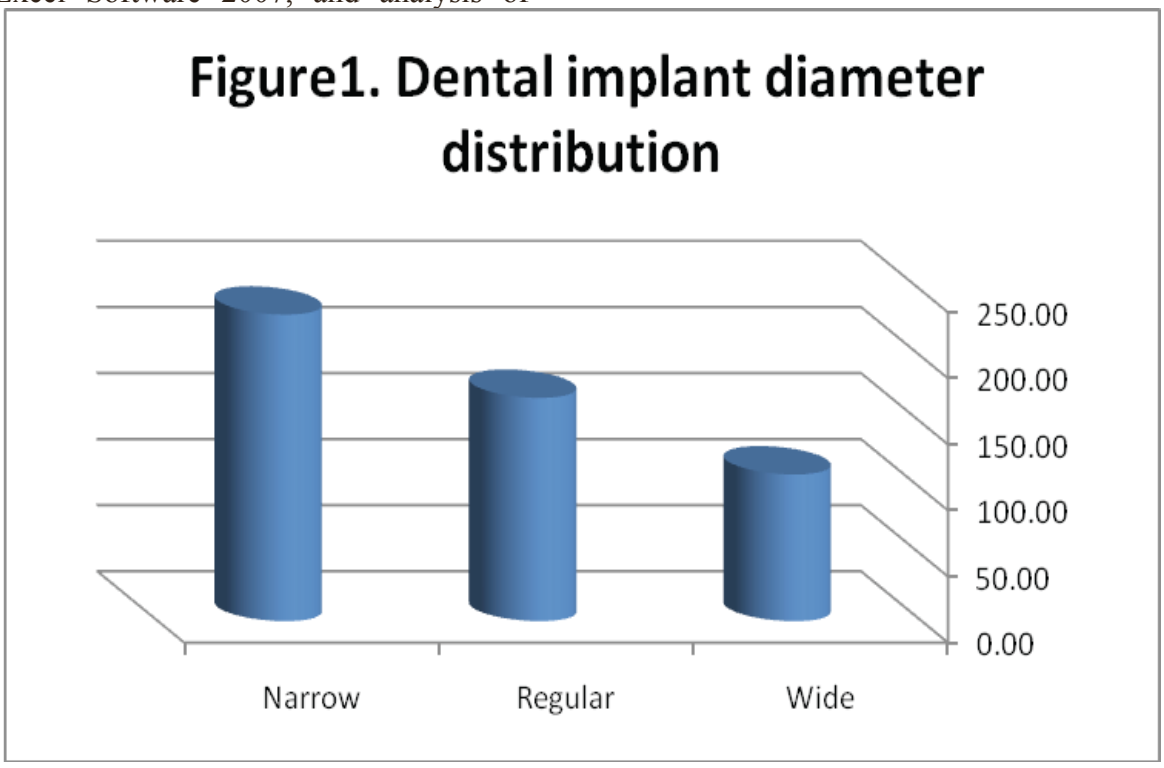
1. The implant is immobile when tested clinically.
2. No evidence of perimplant radiolucency is present, as assessed on an undistorted radiograph.
3. The mean vertical bone loss is less than 0.2 mm annually after the first year of service.
4. No persistent pain, discomfort, or infection is attributable to the implant.
5. The implant design does not preclude placement of a crown or prosthesis with an appearance that is satisfactory to the patient and the dentist.

Data were tabulated and analyzed by use of Microsoft Excel Software 2007, and analysis of Anthropometric data using Epi Info Version 6.

RESULTS

In this study, 603 dental implants (312 maxillary and 291 mandibular) were placed in 285 patients ranging in age from 18 to 77 years (mean, 45.23 years). The nymber if male patients was 152 (53.3%) and the female was 133(46.7%) , and male to female ratio was 1.2:1. A total of 603 implants were installed, with a median of 2.1per patient. The platform and implant connection were conventional internal hexagons and the implant was submerged and not submitted to dental load (delay loading).

We placed 111 wide-diameter implants (Ø5.5mm), 169 regular-diameter implants (Ø4.5mm), and 323 narrow-diameter implants (Ø3.8mm) see figure 1.



The 3 years survival rate for all 603 implants was 96.02%. The largest success rate was observed in wide diameter implants (99%), followed by regular diameter (97.6%) and then narrow diameter (94.11%). See table 1.

Table 1. Relationship of implant diameter to success rate.

Implant diameter	*Quantity*	*success*	*Success percentage*
Wide	111	110	99%
Regular	169	165	97.6%
Narrow	323	304	94.11%

Demographic variables such as gender and age did not show significant statistical differences. Epi Info Version 6 analyses showed significant relationships between diameter of implant and success rate (P-value = 0.03 and chi2= 7.6). Success rate of implant did not show a significant statistical difference with maxillary or mandibular installation (P- value = 0.80 and chi2= 0.06).

DISCUSSION:

The success of dental implants depends on endogenous and exogenous factors. Bone quality and quantity are endogenous factors, and implant diameter

and length are exogenous factors. All these factors appear to influence implant success rates significantly[13]. Bone quality varies in different areas of the jaw bone. Mandibles are usually more densely corticated than maxillae; and both jaws tend to decrease in their cortical thickness but increase in their trabecular porosity as they move posteriorly[14].

For many years, implant configuration has been considered an essential requirement for implant success. Among the related implant parameters, diameter and length play key roles in implant success, since they directly influence the primary stability, placement and removal torque values,[15].

As with this study result, Chiapasco *et al*.16 proposed that it would be better to use implants ≥4 mm in diameter. Few studies have been designed to reveal the effects of implant diameter and length on the implant stability in the posterior maxilla, where bone density is low. In the present study, we found that with the increase of diameter bone stress decreased and implant stability increased, which is consistent with previous studies [17,18].

Load-bearing implants in osteopenic bones with thin cortices and reduced spongiosa need larger dimensions to provide larger load-bearing bone-implant interfaces. The larger the interface, the smaller the unit load on the supporting bone. The unit load should be kept below the operational threshold of the bone's strain range, which is usually near 60 MPa[19,20] in stress terms.

Several meaningful points could be drawn from the perspective of biomechanics. First, stress in type IV bone is influenced by implant diameter and length, Second, biomechanically speaking, implant diameter exceeding 4.0 mm and length exceeding 9.0 mm are the optimal selection for a screwed implant in type IV bone[20], which is consistent with the result of this study.

Type of bone (maxilla or mandible) did not show significant statistical differences in this study, either the type of bone did not influence the success rate , or on the other hand, a second hypothesis might be that osseous class influence long term stress loading (> 5 years), Degidi *et al*.[3]did not find a significant difference associated with bone quality (maxilla or mandible) when evaluating survival of narrow- or wide-diameter implants. They did, however, find a different success rate according to length and diameter, with a better outcome with regard to reduced crestal bone loss over time for shorter than (13 mm) or narrower than (5.0 and 5.5 mm) implants[21].

According to the result of this study the diameter of implant should be considered as a reference for selecting implants. Prospective clinical studies are required to confirm the results.

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Resin-Bonded Fixed Partial Dentures: from Metal-Ceramic to Zirconia What Concerns?

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ABSTRACT
This article describes the use of a resin-bonded fixed partial denture as a conservative solution for the replacement of a missing lateral incisor. A etal-ceramic resin-bonded fixed partial denture RBFPD had been firstly performed then it was replaced by a ZRB-FPD for biological and esthetic concerns.
Key words: Resin-bonded fixed partial denture- Zirconia – Framework – minimally invasive approach

INTRODUCTION

Patients having one anterior missing tooth have different treatment possibilities, which involve removable partial dentures, conventional full coverage retainers, fixed partial dentures (FPDs), and implants[1,2]. The current tendencies in treatment must be an economic option with predictable aesthetic and functional results for the patient [3].

So, among these options, fixed partial dentures, which allow clinically sufficient aesthetic and functional outcomes with minimal surgical intervention, have been widely used in clinical cases[4].

The advantages of RBFPD are basically their non-invasive approach to dentin with only lingual and proximal tooth preparation, then tissue tolerance because of supragingival margins, and finally it reduces both the time and the cost[5; 6].

Nowadays, all authors are convinced that RBFPD are definitely accepted in clinical practice with the concept of minimal intervention (because they preserve the adjacent teeth fairly intact and keep the natural texture of buccal faces).Various studies on this issue have been done and published,and their usefulness is widely clear [7] proving that RBFPDs have shown successful results after a 10-year follow-up period. In addition, a retrospective 13-year follow-up study performed by Zalkind *et al* showed that RBFPDs may serve as long-term or semi-definitive restorations [5].

Whereas, RBFPDs present many disadvantages such as the gray color of the incisal third of the abutment teeth owing to the cast metal lingual retainers., this aesthetic weakness takes place from bonding a metal to the lingual surface of the abutment teeth, and therefore its natural translucency disappears[4, 8].

In our daily practice, patients who have growing interests in aesthetics together with metal allergies drawbacks have paved the way to the use of metal-free restorations in fixed prosthodontics [4; 9].

Indeed, all-ceramic crowns using zirconia have spread rapidly, and zirconia has been widely used in frameworks of crowns and FPDs due to its unique mechanical properties, including so-called "transformation toughening" [4, 5].

Therefore, RBFPDs using zirconia are assumed to improve the rigidity of all ceramic RBFPDs and allow them to reduce the distortion under functional loads. In other words, a zirconia framework currently has the potential to reduce the amount of tooth reduction required to secure its rigidity, compared to a metal framework designed according to the traditional standard. The fact of reducing the amount of tooth preparation is considered to have high clinical significance for the application of ZRBFPDs [4, 15].

The clinical report below describes an alternative treatment for the replacement of a lateral incisor using firstly a metal-ceramic RBFPD which was then replaced by a zirconium resin-bonded fixed partial denture (ZRBFPD).

CASE REPORT:

A 30-year-old female with a noncontributory medical history presented to the Fixed Prosthetics Department of the Dentistry Clinic, University of Monastir for the replacement of the upper lateral left incisor. Further examinations proved that the abutment teeth were intact, immobile, had a favorable crown to

root ratio (radiographic crown height / radiographic root height <1) confirmed by the panoramic and periapical radiographs.

The central abutment was slightly tipped presenting a longer incisal edge compared to its adjacent central, with asymmetrical margins (Fig. 1).

Figure 1: Preoperative frontal view.

An Implant-supported crown, a RBFPD, or a conventional FPD, were the treatment options presented to the patient for the replacement of her missing tooth. On one hand, conventional FPD was not the most suitable solution for the patient and it was also excluded because the abutment teeth were vital and intact [5, 14].

On the other hand, the patient preferred the RBFPD rather than an implant-supported prosthesis because no surgical procedure was needed and the RBFPD requires easier steps.

However, the cantilever RBFPD is frequently indicated, our choice focused on two retainers, to increase the area of the preparation and thus the bonding performance.

The first stage of the preparation was marking occlusal contacts and defining the limits using a round diamond bur with a cervical limit at 1mm of the margin, within the enamel which had to be preserved for bonding. In fact, it is commonly advised that the circumference of the preparation is completely in enamel to ensure a better sealing of the prosthesis which enhances the bonded bridge longevity. The lingual surfaces of the abutment teeth were reduced approximately 0.5 mm. The finish line continued in proximal, while remaining on the side point of the distal contact. The prepared area consists the future bonding zone. The occlusal limit of the preparation depends on the situation of the edge of the opposite teeth and it must be far from (2mm) the contact surface between teeth. Moreover, it must not interfere with the tooth edge presenting a high transparency. [8, 10, 11] The lingual and proximal walls of the central were prepared with a combination of opposing vertical grooves placed at line angles for mechanical retention [12].

Two little cavities has been performed using around diamond, in the cingulum of the central and canine to increase the bonding surface and the prosthesis stability and retention [8].

A Gingivectomy was performed in order to improve the level of the gingival collars, followed by a slight grinding of the edge of the central abutment (fig 2).

Figure 2: Marking preparation area on the cast

In fact, the patient had been satisfied with the metal-ceramic RBFPD (fig 3, 4) during 5 years, requested its replacement by an all ceramic RBFPD.

Figure 3: First trial of the metallic framework.

Figure 4:View of the bonded ceramo-metalic RBFPD

Being encouraged by the patient's motivation, we decided to replace the bridge by a similar non-invasive option allowing a more biocompatible that was RBFPDs using zirconia.

We started by debonding the first bridge. Thus, necessary corrections of the preparation were made to ensure the longevity of the full ceramic prosthesis. Besides, preparations limits were redrawn with a bur to be more readable by the laboratory technician. Whereas more room was necessary in proximal faces, allowing connectors with sufficient mechanical behavior, with due care so that the preparation limits are not buccaly visible. The preparation was carefully polished to avoid any risk of ceramic fracture (fig 5).

Figure 5: the preparation slightly modified

The framework was designed by computer manufactured high-strength Zirconia (Y-TZP) (Cerec in lab system) (fig 6).

figure 6: computerized manufacturing of the framework

Then VM9 ceramic was used for veneering to ensure the best aesthetic outcome.(fig7) .

FIGURE 7: FRAMEWORK AFTER VENEERING

Finally, a big care was given for the bonding procedure, which could affect the prognosis (fig 8, 9).

Figure 8: palatal view of the bonded ZBFPD

Figure 9: Frontal view of definitive restoration.

DISCUSSION

This case illustrates the transition from metal–ceramic RBFPD to all-ceramic RBFPD.

The Indication of this option is justified by the aesthetic demands of the patient.

The choice of two retainers was justified by the increase to the bonding surface and based on some studies which revealed a significantly higher fracture resistance for two-retainer RBFPDs than for cantilever RBFPDs [13].

Current advancements involve the inclusion of all-ceramic systems to eliminate the metal framework and reduce the disadvantage of unaesthetic appearance due to metal inclusion in the incisal third and proximal areas of the abutment teeth. [9, 14].

The use of a zirconia based ceramic (Y-TZP) was proved for its excellent mechanical properties as compared to another type of ceramic. The CAD/CAM (computer aided design and manufacturing) was performed to ensure maximum stiffness and precision of the framework.

The connection of the all ceramic framework known as the weakness zone as exposed to fracture was particularly increased compared to that of a metal framework.

Finally, due care must be taken to check the interocclusal relationship, anterior guidance and potential points of interference in lateral movements before fabrication of a RBFPD, to minimize eventual risk of debonding or failure of the restoration.[5]

SUMMARY

This clinical report describes abutment tooth preparation, and clinical procedures involved in the fabrication of a metal-ceramic RBFPD then a zirconia RBFPD, which provides a conservative solution for the replacement of upper lateral incisors.

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Surveying of Local Factors in Edentulous Iraqi Population

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ABSTRACT :

Introduction : The diagnosis and prognosis for complete denture are influenced by many factors .Local factors could play a significant role in this aspect .These factors could be variable from race to race .Accordingly the researcher decided to carry out a survey on Iraqi patients to find out the distribution of these factors among Iraqi population and to figure out if there was any inter relationship between them .

Materials and Methods : A sample of 200 Iraqi edentulous patients was selected randomly (male and female). The range of the age was 40-80 years old .the evaluation of local factors were decided by visual and digital examination. These factors were face form ,ridge form ,size of the ridge antero-posterior position of the tongue ,depth of the palate ,ridge relationship .

Results : regarding face –form relation ,both ovoid and square face-form constituted 32% of each of them whereas other classes showed lesser percentages . Regarding the interrelationship between tongue size and antero-posterior position of the tongue, there is (to some extent) a relation between the size of the tongue and the antero- posterior position of the tongue.The percentage of medium size tongue agreed with that of the retruded tongue, whereas the small size tongue corresponded to the protruded tongue. Regarding depth of the palatal vault and size of the tongue, there is (to some extent) a correlation between them, medium palatal vault correspond with the medium size tongue.

Conclusion : It was concluded that most of the corresponded local factors played a role in diagnosis and prognosis of the Iraqi edentulous patients and there was inter-relationship among these local factors which had an effect on diagnosis and prognosis of edentulous patients .

Keywords : local factors, palatal vault, ridge relationship ,tongue size .

INTRODUCTION :

The diagnosis and prognosis for complete denture are influenced by many factors. These factors implicate extra-oral and intra-oral factors. As a general term these factors are considered as local factors .Local factors could play a significant role in assessment of the prognosis of complete denture. These factors could be variable from race to race and could have inter-relationship among each other. These factors could include face form, ridge form, size of the ridge ,antero-posterior position of the tongue ,depth of the palatal vault and ridge relationship .Accordingly ,a survey is decided to be carried out on Iraqi patients to find out the distribution of these factors among Iraqi population and to figure out if there is any inter relationship between them .

MATERIALS

A sample of 200 edentulous patients selected randomly male and female, age 40 – 80 years to find out the percentage and if there was any inter-relationship between the following data of Iraqi population:-

1. Face form.
2. Ridge form.
3. Size of the ridge.
4. Antero – posterior position of the tongue.
5. Depth of the palatal vault.
6. Ridge relationship.
7. Any inter-relationship between the above-mentioned classes.

METHODS

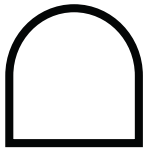
visual and digital examination

Face – Form

The frontal view of the face is considered as a basis to determine the face form. The face from is classified into the following classes:

a. Ovoid form: - which is characterized by curved feature of the frontal view of the face. Fig.1

Figure 1



Inverted maxillary central incisor

b. Square form:- which is characterized by comparing the distance between the width of the forehead and that between the angle of the mandible they should be more or less have the same dimension. Fig.2

Figure 2

Inverted maxillary central incisor

c. Tapering form :- which is characterized by narrowing towards the chin.Fig.3

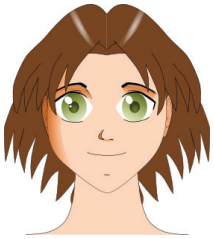


Figure 3

Inverted maxillary central Incisor

d.Combination of the above-mentioned classes of face e.g. Square – tapering, square –ovoid… etc.

Ridge Form or Ridge Shape [2, 7, 8,9,10]

It means the cross section of the ridge in any part of it. The ridge form has certain effect on stability of the denture it may differ in different parts of the ridge e.g. It may be square in the anterior region and tapering in the posterior part, rarely the whole ridge has the same configuration. Generally speaking speaking ridge shape is classified into the following classes: - [1, 4, 5]

a.Ovoid or rounded :

Figure 4

b.Square:

Figure 5

c.Tapering:

Figure 6

Size of the ridge

The size of the ridge means bulk of the ridge [3,10]. The greater the bulk or foundation, the better is the retention of the denture. Denture retention demands maximum coverage and maximum extension within the limit of health and function.

Size of the tongue [1, 4, 7, 8]

The space in the oral cavity determines the size of the tongue.

Size of the tongue can be classified as follows:-

a.Medium: - the lateral convexity of the tongue just touching the lingual sides of the mandible.

b.Large: - the lateral convexity of the tongue covers the apex of the residual mandibular ridge and touching the buccal mucosa of the cheek.

c.Small: - there is little space between the lateral convexity of the sides of the tongue and the lingual surface of the residual mandibular ridge.

Antero – posteriorpositon of the tongue

It can be detected when the patient opens the mouth, the antero-posterior position of the tongue will take one of the following:-

a.Retruded position: - the tongue is pulled backward.

b.Protruded position: - the tongue is thrusted forward.

c.Medium position: - which means the lateral convexity and the tip of the tongue are just touching the lingual and anterior sides of the mandibular residual alveolar ridge.

Depth of palatal vault [1, 2, 4, 6]

Depth of palatal vault, sometimes called shape of the palatal vault, it have considerable effect on stability of the upper denture. It can be classified into three classes as follow:-

a.Shallow: - which means not deep; in other wards the depth of the hard palate is little.

Figure 7 Shallow depth of the hard palate

b.Deep:- sometimes called (v) shape hard palate

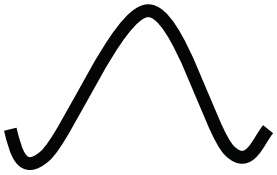


Figure 8 Deep hard palate

c.Medium :-

Figure 9 Medium depth hard palate

Ridge relationship [1, 2]

There are centric and eccentric jaw relationships. This study was concerned only with centric jaw – relationship.

This relation can be classified into three classes as fallow:-

a.Class I:- in which the most anterior point of the upper jaw is located on the same alignment with the most anterior point of the lower jaw or slightly anterior to it, about(2)mm Fig.10

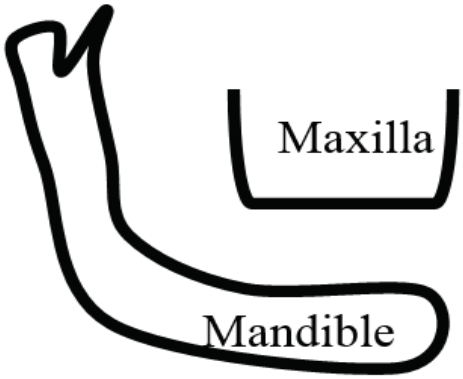


Figure 10 Class I jaw – relationship

b.Class II:- in which the most anterior point of the mandible is retruded more than (2)mm from that of the maxilla Fig.11

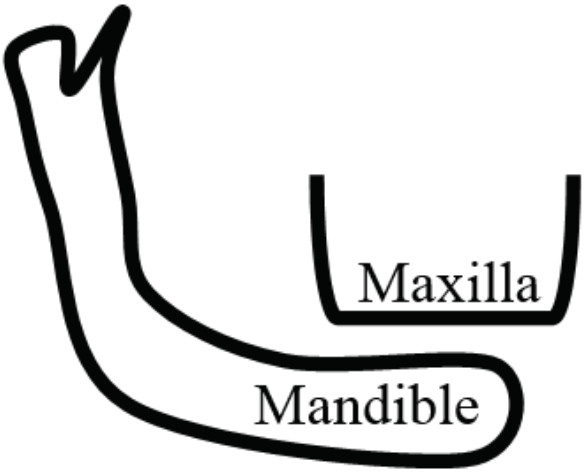


Figure 11 Class II jaw – relation

c.Class III:-in which the most anterior point of the mandible is protruded in other wards the mandible is anterior to the maxilla Fig.12

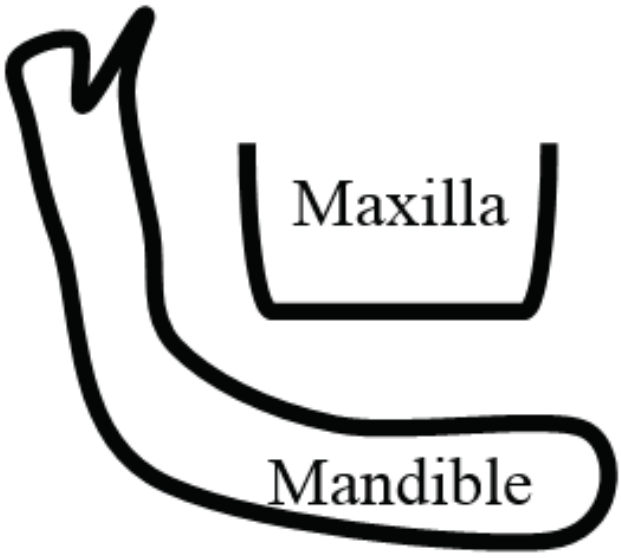


Figure 12 Class III jaw – relation

RESULTS

The following table shows the number and percentage of each group. Table number 1

Table no.1

Face form	Ovoid 64 32%	Square 64 32%	Tapering 20 10%	Square – tapering 30 15%	Square – ovoid 22 11%
Ridge form	Ovoid 80 40%	Square 62 31%	Tapering 58 29%		
Size of the tongue	Medium 107 53.5%	Large 56 28%	Small 37 18.5%		
Antero – posterior position of the tongue	Medium 63 31.5%	Retruded 80 40%	Protruded 57 28.5%		
Depth of the palatal vault	Shallow 21 10.5%	Deep 48 24%	Medium 131 65.5%		
Ridge – relation ship	Class I 111 55.5%	Class II 20 10%	Class III 69 34.5%		

One of the purposes of this study was to find out whether there is relationship between the data of the survey. The data which were relatively unstable were excluded e.g. ridge form because it was changeable due to bone resorption. Ridge relationship (centric jaw relation) though it is fixed antero-posterior bone-to-bone relation, but it is not considered reliable in this study, because the pattern of bone resorption of the upper jaw was different from that of the lower jaw which led to alteration in the shape of both upper and lower jaw. The other data which was face form, size of the tongue, antero-posterior position of tongue and depth of the patal vault were relatively stable.

Table no.2

Face form	Ovoid 64 32%	Square 64 32%	Tapering 20 10%	Square – tapering 30 15%	Square – ovoid 22 11%
Size of the tongue	Medium 107 53.5%	Large 56 28%	Small 37 18.5%		
Antero – posterior position of the tongue	Medium 63 31.5%	Retruded 80 40%	Protruded 57 28.5%		
Depth of the palatal vault	Shallow 21 10.5%	Deep 48 24%	Medium 131 65.5%		

DISCUSSION

Face form can be used as a guide for selecting the form of upper central incisor, because the frontal view of the inverted maxillary central incisor should conform to the frontal view of the face. Face form was relatively stable. Ovoid and square face forms were predominant and each of them constituted 32% of the sample which means both ovoid and square face form constitute 64% of the Iraqi population, whereas the other classes (tapering, square – tapering, square ovoid) constitute only 36% regarding the size of the tongue the medium class represent the high percentage 53.5% whereas the lower percentage was the class of small tongue 18.5%.

Regarding the antero posterior position of the tongue, protruded was representing 28.5% whereas the class of retruded tongue was representing the higher percentage 40%.

Regarding the depth of palatal vault, the medium was representing the high percentage 65.5% whereas the lower percentage was the shallow 10.5%.

To consider, whether there is any correlation between any one of the classes, it seems logical to compare the classes which have similarity like size of the tongue and antero posterior postion of the tongue. It seems that there is (to some extent) inter relationship between the size of the tongue and antero posterior position of the tongue because small tongue and protruded tongue both of them have the lower percentage, whereas medium size tongue and large tongue correlate with retruded tongue according to the percentages of this study.

Regarding the depth of the palatal vault and size of tongue, there was correlation between them, because the palatal vault of medium depth and the tongue of the medium size both of them showed high percentage, whereas the small tongue and shallow palatal vault showed a lower percentage.

SUMMARY

Survey of some of the local factors used for the diagnosis and prognosis of the complete denture patients was made on a sample of (200) patients, male and female, aged (40 – 80) selected randomly. The purpose of this survey was to show the distribution of these factors among Iraqi population and to find out if there was any inter-relationship between them.

CONCLUSION

1. Regarding the percentage of face form both ovoid and square face form constituted 32% of each of them, whereas the other classes showed lesser percentage.
2. Regarding the inter-relationship between tongue size and antero-posterior position of the tongue, there was (to some extent) relation between size of the tongue and antero-posterior position of the tongue, the percentage of medium size tongue agreed with that of the retruded tongue, whereas the small size tongue corresponded to

the protruded tongue.

3. Regarding depth of the palatal vault and size of the tongue there was (to some extent) correlation between them, medium palatal vault corresponded with th medium size tongue.

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