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Research Article

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The relationship between the impaction of Mandibular Third Molar and Guns Ratio

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ABSTRACT

Tooth impaction is one of the major and common issues in dentistry .Several factors can influence on tooth impaction .According to this, the purpose of this study was to investigate the relationship between the impaction of mandibular third molar and Guns ratio.This study is a cross - sectional survey .Among the cases referred in the last year to Oral and Maxillofacial Radiology Center in Kermanshah, 130 patients (65 patients with lower third molars was grown and 65 patients with impacted lower third molar mesioangular) aged 20 to 30 years were selected randomly. Patients who met inclusion criteria based on existing panoramic radiography, angle of inclination of the third molar to second molar (beta) angle of inclination of the third molar to mandibular base (alpha) the most distal point between the second molar to the anterior border of the ramus to width of the third molar (Guns ratio) and the angle between the posterior border of ramus and the lower edge of the mandibular (Gonial) were drawn manually. And data were collected and then the data is collected using software SPSS18 at the descriptive statistics (mean, standard deviation) and inferential statistics (t-test) and statistical analysis was conducted and the results were reported. The results showed that there were no significant differences between the angles alpha, beta, gonial and Guns ratio on the left and right in each impacted tooth and unerupted groups ($p>0.05$). The findings showed that there is a significant difference between the angles alpha, beta and the Guns ratio within the grown and impacted groups ($p<0.05$). The findings also showed that the angle alpha, beta and Guns ratio predict the impaction of the mandibular third molar at low level. However, gonial angle of mandibular third molar impaction to predict is not appropriate: According to the research findings, we can conclude that the angles alpha, beta and ratio Guns ratio can effect on third molar impaction. It also calculates the angles alpha; beta and Guns can predicted the third molar impaction.

Key words: third molar, panoramic radiography, impacted tooth mishe, baraxneveshtam

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INTRODUCTION

Tooth impaction means the eruption of teeth in the dental arch for a specified period has failed. One of the big problems that dentists face is the third molar impaction.The complexity of the etiology of third molar impaction due to various pathological conditions leads to the clutter dental arch and instability of orthodontic treatment. 98 % of the total of impaction is due to third molar tooth. Wisdom tooth in term of size, shape, position, root shape, origin, evolution and the growth direction is varied, so that the growth time of third molar tooth varies considerably

between populations and this time in the male is 3 to 6 months earlier than women .In addition, the average age is 20 for the third molar eruption although growth continues in the number of patients in 25 years [1].

In case of lack of symptoms associated with third molar impaction may the impaction with various pathological processes such as simple decay, pericoronitis, Cyst is associated [2].There are several reasons for third molar impaction include: lack of space, limited skeletal growth, distal eruption of tooth system, vertical condylar growth, delayed puberty of third molar and impacted tooth crown size [3].

Additionally, a number of structures such as Buccinator muscle, pterygomandibular raphe, and the external oblique ridge are component of latent factors since internal Pterygoidmuscle and master in parasites Gonial, the force of contraction of the muscles effect on the mandible base [4].

Research has four major factors in decrease the length of the mandibular arch, condylar growth vertical path, the distal path of growth and developmental delay mandibular teeth is effective in impaction [5].

Although racial differences in the growth sequence, the third molar teeth of all races are the last teeth that erupt ant the most common cause of third molar impaction [6].One of the causes of lower third molar impaction, the teeth is not turn from of the mesioangular angle into a vertical position. During normal development, lower third molar, grows in the horizontal angle when the teeth and jaw growth and evolve, lack of mesioangularinto vertical rotation, causing impaction of third molar [7].

Impaction or unerupted third molar is an important clinical issue, because tooth is useful for Anchorage ortho unit, prosthetic abutment or transplant [8]. Prediction of mandible third molar impaction in term of the possible complications of surgery and orthodontic aspects and the impact of mandible third molar impaction on crowding of the mandibular, , mandibular anterior teeth relapse, interfere with Anchorage the first and second molars teeth, distal to the second molar and caries and periodontal problems is important [9]. Considering the position of the impacted tooth on the mode of treatment, injuries of its complications and the cost of treating is considered, the report can be useful. The issue raised in this study also investigated the relationship between the mandibular third molar impaction and the distance of the anterior border of the ramus and the second molar that based on this study the Guns ratio, angle alpha, beta angle and Gonial angle was evaluated and measured.

EXPERIMENTAL SECTION

This study is a cross - sectional survey .Among the cases referred in the last year to Oral and Maxillofacial Radiology Center in Kermanshah, 130 patients (65 patients with lower third molars was grown and 65 patients with impacted lower third molar mesioangular) aged 20 to 30 years were selected randomly. Inclusion criteria include patients who have not previously undergone orthodontic treatment, respectively. Among 130 Panoramic radiographs samples, 65 samples with mesioangular impacted wisdom teeth (angle between the longitudinal axis of the second and third molars are more than zero and less than 55 degrees) and 65 subjects with the third molar eruption were enrolled. Patients who have a cyst, tumor, removed tooth or hypodontia in each tooth, the high position of the bucco-oral and mesioangular more than 10 degrees were excluded from the study. Radiographic images of Guns ratio and the angles alpha, beta and Gonial and indicators need to lower impacted third molars tooth was obtained manually.And data were collected and then the data is collected using software SPSS18 at the descriptive statistics (mean, standard deviation) and inferential statistics (t-test) and statistical analysis was conducted and the results were reported. All radiographs were on negatoscope, gansratio, angelsgonial, alpha, beta was evaluated and measured (Fig. 1)

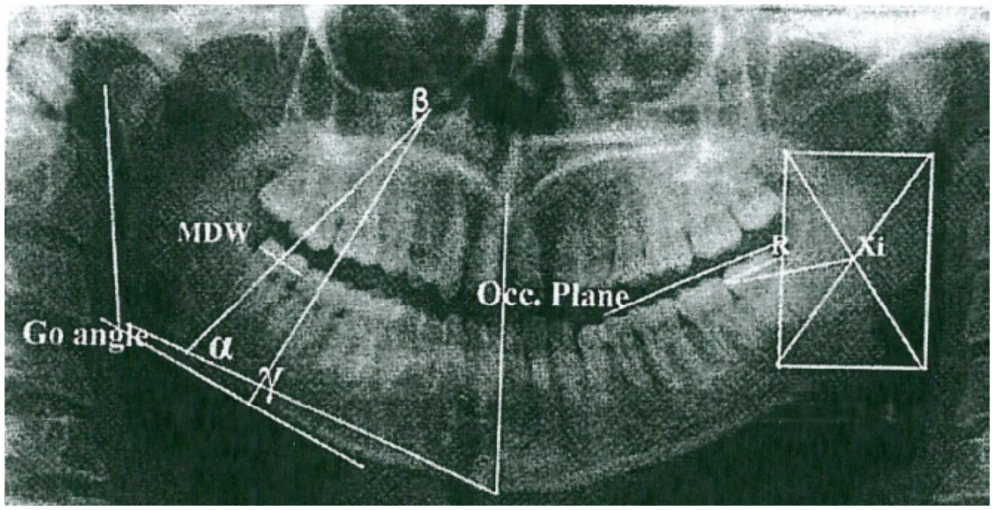

Figure 1: method of measurement angels gonial, alpha (α),beta (β) and gans ratio

RESULTS

The study results of the angles alpha, beta and the Guns ratio showed that there were differences between mean angle measured on the left and right tooth in impacted and unerupted groups (table 1).

Table 1: compares the mean, minimum, maximum and standard deviation angles left and right of impacted teeth and erupted tooth in the participants in this study

Tooth / Angles	Impacted				Erupted			
	Mean	Maximum	Minimum	Standard deviation	Mean	Maximum	Minimum	Standard deviation
Right Guns	0.679	1.1	0.272	0.182	1.156	1.521	0.894	0.137
Right Gonial	123.385	133.000	110.000	5.680	122.380	135.500	111.000	6.101
Right alpha	61.154	85.500	50.000	8.013	75.029	88.000	60.000	5.656
Right Beta	23.508	45.000	8.500	9.420	10.212	17.000	6.500	2.384
Left Guns	0.704	1.100	0.285	0.176	1.147	1.640	1.000	0.157
Left Gonial	123.923	135.000	112.500	5.797	122.394	136.500	111.000	5.546
Left Alpha	60.985	87.000	50.000	8.590	75.465	85.000	63.500	5.002
Left beta	22.108	43.000	10.000	8.883	10.185	15.500	5.000	2.284

To study whether this difference is significant t-test was used to test the results of these tests (Table 2) showed that there is a significant difference between right angles alpha, beta right and right Guns ratio, and also left the angles alpha, left beta and left Guns ratio in erupted and impacted tooth ($P>0.05$).However, a significant difference between right Gonial angles and left Gonial angles in erupted and impacted tooth were observed ($P<0.05$).

Table 2: Results of t-test for each erupted and impacted tooth

Angles	Leven test		t	Degrees of freedom	Standard deviation	Significance level
	F	sig				
Right Guns	4.530	0.035	-16.863	128	0.0282	0.000
Right Gonial	1.528	0.219	0.927	128	1.033	0.333
Right alpha	6.601	0.011	-11.406	128	-13.875	0.000
Right Beta	71.099	0.000	11.031	128	13.295	0.000
Left Guns	3.182	0.077	-15.091	128	-0.442	0.000
Left Gonial	0.378	0.540	1.537	128	0.995	0.127
Left Alpha	14.008	0.000	-11.745	128	1.232	0.000
Left beta	60.322	0.000	10.481	128	1.137	0.000

According to Wilks lambda test the separation function can explain 82.8% erupted and impacted tooth variance and only 17.2% did not explain the changes that have been reported in Tables 3.

Table 3: Wilks lambda value

Value Wilks' Lambda	Chi-square	Degrees of freedom	Significance level
0.172	220.330	6	0.000

The findings showed that the angle alpha, beta angle and Guns ratio on the right and left are measurable; the following formula can be used to predict the third molar impaction .This formula can predict 95.4% of third molar impaction (P>0.05).

Y1= -629.7 + 032.0 (X1) - 046.0 (X2) + 568.4 (X3) + 028.0 (X4) – 033.0 (X5) + 739.0 (X6)

Research findings showed that if we just predict lower right molar impaction in this case we can use the following formula

Y2= -519.7 + 056.0 (X1) - 068.0 (X2) + 249.5 (X3)

This formula can predict 95.4% of third molar impaction means that could not predict only 6 impacted teeth (P>0.05).Research findings showed that if we just predict lower left molar impaction in this case we can use the following formula.

Y3= -323.7 + 059.0 (X1) - 056.0 (X2) + 52.4 (X3)

This formula can predict 96.2% of third molar impaction means that could not predict only 5 impacted teeth (P>0.05).

DISCUSSION

Longitudinal studies have shown that many third molar teeth erupted until age 24 or later.But in some cases, the tooth will remain impaction.Many factors can affect the teeth remain impaction .This study aimed to investigate the influence of angles alpha, beta, and Gonial ratio on the lower third molar impaction.

In this study, 130 people who have testing requirements studied in the experiments. Panoramic radiography images were obtained from all and the corresponding angles and Guns ratio were measured and compared for everyone.

The findings showed that there is no difference between the angles alpha, beta, Gonial and Guns ratio in the teeth of the left and right (within each group impacted and erupted of teeth).But there is a difference between the angles and Guns ratio in impacted and erupted teeth.

The difference in the angles alpha, beta and Guns ratio was significant but gonial angle (left and right), the difference was not significant .This means that the angles alpha, beta and Guns ratio can predict the effect of impaction of lower third molars. The results of studies were consistent with Panahi Boroujeni et al (2011), Uthman et al (2007) research (1, 10). They reported in their study alpha angles, beta and Guns ratio to predict lower third molar impaction is effective. Data analysis showed that the prediction of angles alpha, beta and Guns ratio to predict mandibular third molar impaction is over 80%.

The findings could be determined a formula using calculation of angles alpha, beta and Guns ratio can predicted over 80% of impaction in left and right molar teeth over ninety percent successfully.

The findings showed that there is best prognostic between angles alpha, beta and Guns ratio in lower third molar impaction.

Research findings showed that if we want just predict the right teeth impaction (lack of left jaw third molars) with angles alpha, beta and Guns ratio, predicted value is over 80%. By calculating the angles alpha, beta and Guns ratio according tothe formula obtained in the research findings, the success of the predicted in the impaction of mandibular third molar in the upper right is over 90%.

Research findings showed that if we want just predict the left teeth impaction (lack of right jaw third molars) with angles alpha, beta and Guns ratio, predicted value is over 75%. By calculating the angles alpha, beta and Guns ratio according to the formula obtained in the research findings, the success of the predicted in the impaction of mandibular third molar in the upper left is over 90%.

CONCLUSION

According to the research findings, we can conclude that the angles alpha, beta and Guns ratio can effect on third molar impaction. Calculating the size of the angles alpha, beta and Guns ratio and put them in a calculation formula can be predicted third molar impaction. Predict and determine the lower third molar impaction can lead to appropriate treatment and prevention.

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