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IAN IS NEGATIVELY CORRELATED WITH THE LOWER THIRD MOLAR

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ABSTRACT

In this study, Classes IIA and IIB predominated in the impaction pattern of the mandibular third molar. Additionally, the presence of a dark line at the root apex on the panoramic radiograph indicated that the root of the mandibular third molar was frequently situated in the lingual cortical bone. It was observed that the concurrent narrowing of the inferior alveolar nerve (IAN) and the lingual driving pathway of the IAN in CBCT indicated a heightened risk of IAN injury. These two things happen at the same time, and doctors should tell the patient about the risk of IAN injury and the need to be more careful when pulling teeth.

KEYWORDS: Mandibular third molar impaction, Class IIA and IIB impaction, Inferior alveolar nerve injury.

1. INTRODUCTION

From the skull, the mandibular nerve, which is the biggest of the three branches that comprise the trigeminal nerve, exits and enters the infratemporal fossa, which is located medial to the lateral pterygoid. This occurs via the foramen ovale, which is located in the middle of the skull. After then, it separates into a smaller trunk in the front and a larger trunk in the back.[1] The anterior trunk travels via the area that is located between the roof of the infratemporal fossa and the lateral pterygoid, potentially leading to nerve entrapment.[2] Tooth impaction is a common problem with how teeth are lined up.[3] Dens retens, consists of a root that has reached its full maturity but is either partially or completely surrounded by tissues, which happens after the normal eruption phase.[4] The Pederson index[5] was used to figure out how complicated it would be to remove an affected object using surgical means mandibular third molar (TM). Enamel is the most calcified tissue in the human body because it has a mineral content of about 95%, which is much higher than dentin's 69%. Because it has a lot of minerals, almost all of the water and organic matter is removed during development.

After the ameloblast finishes the matrix deposition phase, the terminal bar apparatus disappears, leaving behind a smooth surface enamel.[6] The higher mineral content in enamel depends on getting rid of moisture and protein. This exchange mechanism occurs during most of the maturation of enamel and is not limited to the final phase of mineralisation. After eruption, the mineralisation of enamel continues.[7] In addition to a comprehensive health history, the medical evaluation encompasses evaluations of the patient's psychological state, physical condition, clinical examination, and conversation with the patient.[8] Taking out impacted TMs is a surgical procedure that has a higher risk of problems than other dental treatments. Furthermore, patients frequently display anxiety and apprehension regarding the procedure.[9] This study focused on the black in the panoramic radiograph, the line that is located at the root apex, which showed it was common for the lingual cortical bone to house the root of the TM in the lower jaw. These two causes happen at the same time, so doctors should tell patients about an increased likelihood of causing harm to the inferior alveolar nerve (IAN) and the need to be more careful when removing teeth.

2. MATERIALS AND METHODS

2.1 Sample Preparation: The Al-Shahed Nasser Specialised Centre approved this research, which took place from October 1, 2023, to March 20, 2024, and

included people with a third tooth in the lower jaw. They had examinations consisting of a cone beam computed tomography (CBCT) scan and a panoramic x-ray. The decision was made to divide the auditors into two groups: the first group included the following individuals; 12 was tested with an orthopantomogram (OPG), and the second group of 15 was tested with a CBCT.

2.2 The Impaction Pattern: The study examined the design of the impaction pattern of the third molar in the mandible, considering variables such as the patient's age and gender. This study employed panoramic radiography in conjunction with the patients' medical records for a thorough evaluation. This study elucidated the impaction pattern of the third molars which are located in the mandible by employing two primary classification criteria.[10]

2.3 Winter's Classification: According to Winter's categorisation, the angle at which the mandibular TM makes contact with anything is taken into consideration.[11] When it comes to the alignment of the mandibular second molars along their long axis, the reference angle is an important consideration. As seen in Figure 1, the categorisation of orientations included vertical (10°–−10°), mesi angular (11°–79°), horizontal (80°–100°), detangler (−11°–−79°), transverse (buccal–lingual), and inverted (101°–−80°) orientations.

2.4 Panoramic Radiograph: For the purpose of this investigation, panoramic radiography was used to explore the connection that exists where the root of the mandibular third molar is located and the IAN is located. On the basis of the seven radiographic markers that Rood and Shehab proposed[20], the darkening and bifurcation of the root apex in the inferior alveolar nerve region were categorised as a case of root darkening, attributed to the challenges in differentiation. Additionally, observations were made regarding the presence of the black line same occurrence was further examined at the root tip. Seven observations were used to classify the radiographic signals (Figure 2 and Figure 3): (1) occurrences of root darkening in the IAN region, (2) occurrences of root curvature in the IAN region, (3) occurrences of root narrowing in the IAN region, (4) occurrences of a dark line at the root apex, (5) occurrences of loss of the white line of the IAN at the root region, (6) occurrences of narrowed IAN at the root region, and (7) occurrences of altered IAN pathway at the root region.

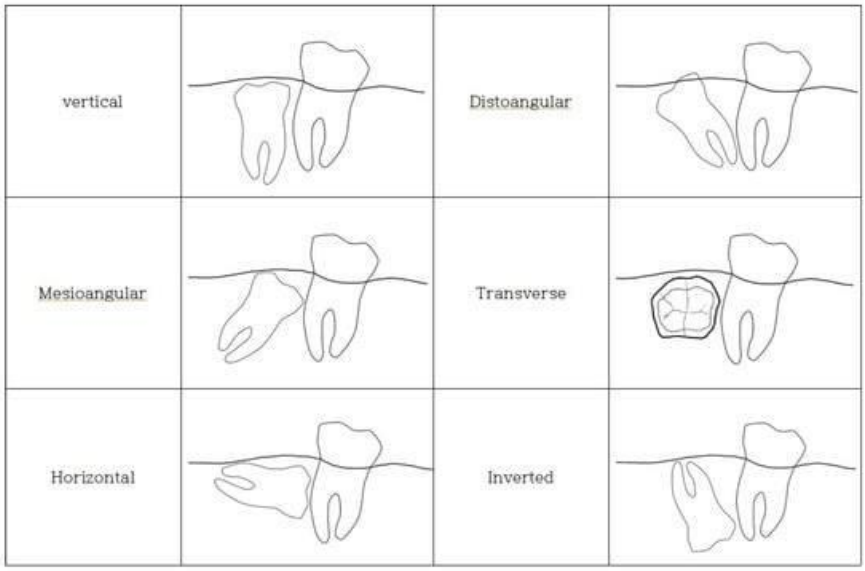

Figure 1: Winter's classification.

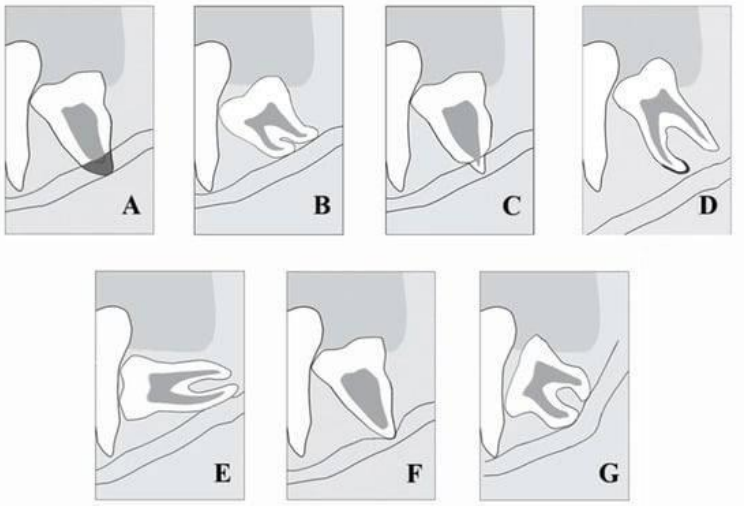

Figure 2: Root-Shehab classification of radiographs: D) black line at the apex, E) the disappearance of the white line, F) the constriction of (IAN), and G) the diversion of the IAN.

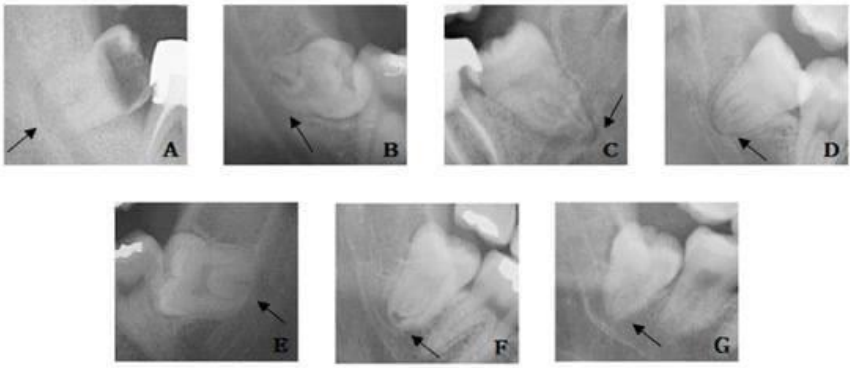

Figure 4: Overview. Symptoms observed include root darkening, deflection, narrowing, a black line at the apex, loss of the white line, constriction of (IAN), and diversion, all indicated by arrows.

3. RESULTS

Table 1: Demonstrate gender and age-related bone loss.

		Gender	Age	Bone Loss
N	Valid	6	6	6
	Missing	0	0	0
Mean		1.33	33.33	1.667
Std. Deviation		.516	6.890	.5164

Table 2: Show how the sample sizes are divided up by the gender of the people taking part.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	4	66.7	66.7	66.7
	Female	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

Table 3: show how the percentage of sample sizes changes depending on how old the people are.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25	1	16.7	16.7	16.7
	27	1	16.7	16.7	33.3
	32	1	16.7	16.7	50.0
	34	1	16.7	16.7	66.7
	39	1	16.7	16.7	83.3
	43	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

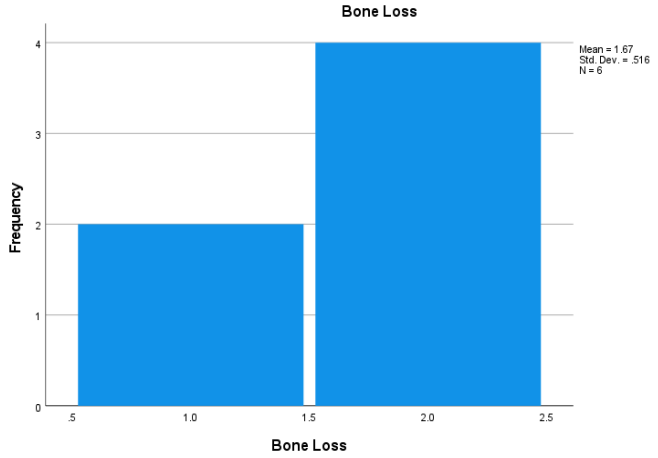

Figure (1) shows how the size of the sample depends on how much bone loss.

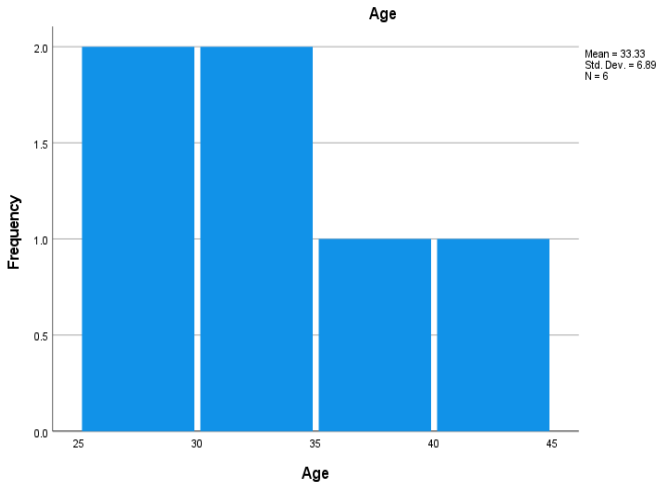

Figure (2) illustrates the percentage of sample sizes based on the participants' ages.

Table 4: Relationship among bone loss outcomes, gender, and patient age.

		Gender	Age	Bone Loss
Gender	Correlation	1	.187	-.250
	Sig.		.722	.633
	N	6	6	6
Age	Correlation	.187	1	.824*
	Sig.	.722		.044
	N	6	6	6
Bone Loss	Correlation	-.250	.824*	1
	Sig.	.633	.044	
	N	6	6	6

4. DISCUSSION

The study analysed a pattern of impaction and the elements that create risk linked to IAN injury in Najaf. The analysis revealed multiple deficiencies. Since this was a short study done by only one group, it can't be said that the results are representative of the Najaf population.[12] Secondly, the study concentrated solely on patients undergoing panoramic radiography and CBCT, as opposed to a random sample.[13] The tables (1-3) in this study concentrated on individuals with impacted mandibular TMs and those who underwent CBCT due to apprehensions regarding inferior alveolar nerve contact, thereby differentiating it from previous research. The results are not applicable to Najaf residents with impacted third mandibular molars due to difficulties in data interpretation.[14] Third, the lack of follow-up and the poor quality of medical records made it hard to give full descriptions of the symptoms of IAN damage. In line with prior research.[15]

Within the realm of Surgical procedures for oral and maxillofacial conditions treatment that is carried out the most often is the removal of the TM from the mandible.[16] When the IAN is damaged, it may result in

a great deal of discomfort for the patient and bring about a decline in their quality of life. On the other hand, there is a lack of research that investigates the connection between the innervation of the lower jaw and the third molars of the mouth in a variety of groups.[17]

Table 4 shows how bone loss is related to gender and age of the patient. The outcomes of this study can inform the trajectory of subsequent research initiatives.[17,18] By undertaking additional complementary studies, we can establish the criteria for classifying the mandibular TM within the Najaf population, proficiently analyse the third molar utilising artificial intelligence, and develop programs to assess extraction difficulty, damage to the inferior alveolar nerve as a potential danger, and the likelihood of complications.[19] This research was conducted with the purpose of determining the extent to which mandibular TM impaction is prevalent in Najaf and to evaluate the risk variables that are connected with IAN damage that occurs after extraction.

5. CONCLUSION

The findings of this research indicated in regard to the impaction of the mandibular TM pattern was characterised by the most prevalent classes, which were Class IIA and IIB impaction. The development of a black line on the panoramic radiograph that is located near the root apex is another piece of evidence that indicates This is the root of TM in the mandible is normally located inside the lingual cortical bone. This is the case since the root is located in the mouth. The likelihood of injury to IAN increases. while these two problems are present at the same time, medical professionals have a responsibility to advise patients about the risks having the potential to cause harm to IAN and the essential need of exercising great care while extracting teeth.

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