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Radiographical assessment of impacted lower third molar

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BY

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بسم الله الرَّحْمَنِ الرَّحِيم

((وَقُل رَّبِّ زِدْنِي عِلْمًا))

(صدق الله العظيم)

سورة طه/ ايه ١١٤

Certification of the Supervisor

I certify that this project entitled"Radiographicalassessment of impacted lower third molar " was prepared byTamaraGhether Faker under my supervision at the College of Dentistry/University of Baghdad in partial fulfilment of the graduation requirements for the Bachelor degree in dentistry.

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2023

Dedication

I dedicate this project to my family, my source of unlimited support & who always encourage me to receive knowledge.

Also I would like to express appreciation for my supervisor Dr. RESHA GAMEEL for her precious efforts to help me

Acknowledgment

First of all I'd like to thank ALLAH for helping me to complete this project then I would like to thank my supervisorDr.ReshaJameel for guidance and advice, to Prof. Dr.Raghad Abdul-Razaq, dean of collage of dentistry, university of Baghdad for his continuous support for the students. Deep appreciation and respectful regards to Dr.Bashar, head of Oral Diagnosis department, College of dentistry, University of Baghdad, for facilitating the commencement of this project and providing all the support at his disposal.

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Symbol	Abbreviation
TMJ	**Temporomandibular joint**
Mand	**Mandible**
PR	**Panoramic radiography**
Yrs	**Years**
CBCT	**Cone-Beum computed Tomography**
No	**Number**
%	**Percentage**
AAOMS	**American Association of Oral and Maxillofacial surgeons**
IOPA	**intraoral periapical radiograph**

Introduction

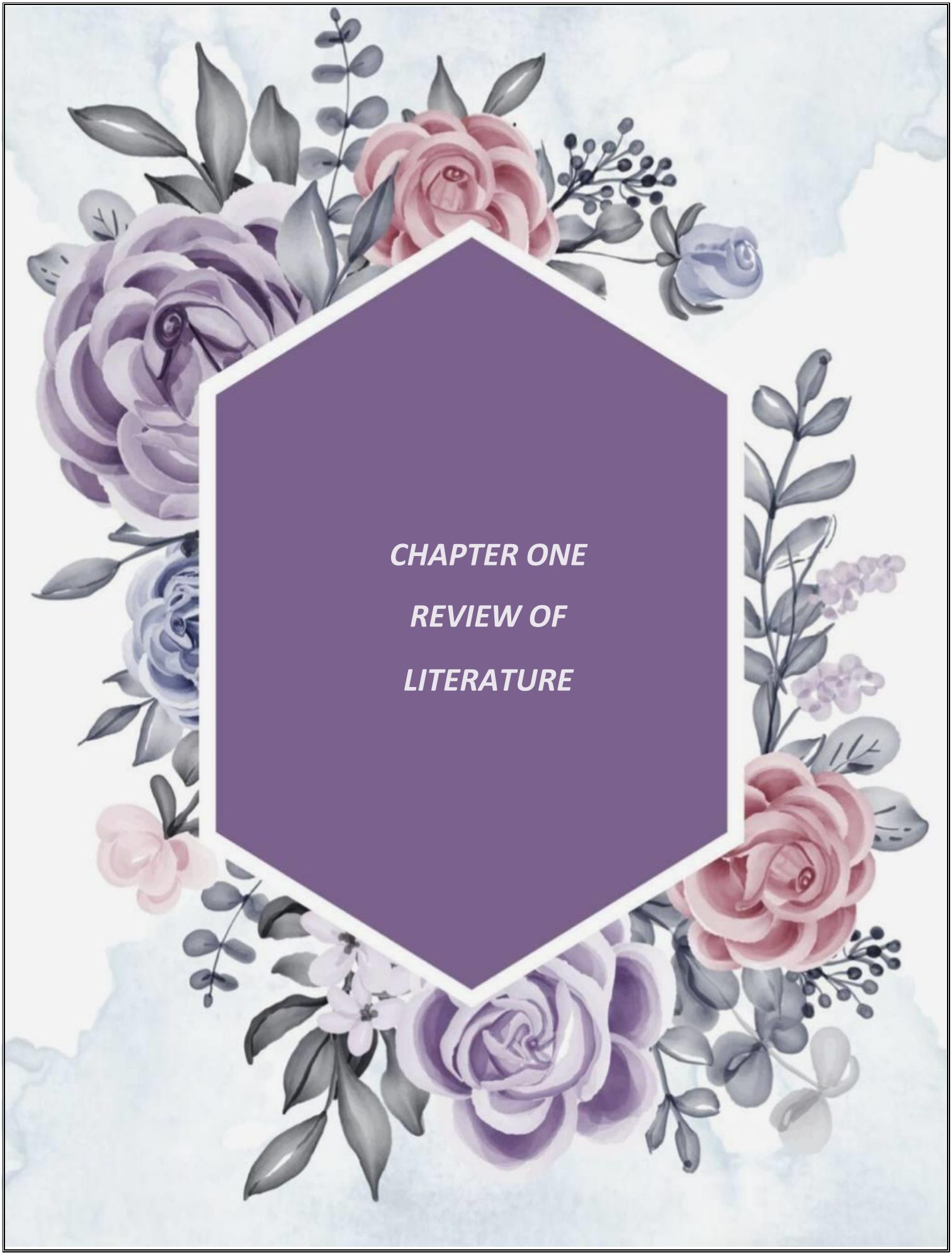
The presence of an impacted mandibular 3rd molar as a developmental anomaly is widely recognized all over the world. It is included within the World Health Organization definitions of the International Classification of Diseases (ICD-10 World Health Organization. International Statistical Classification of Diseases and Related Health Problems.). It is well known that customarily the surgical extraction of a diseased or symptomatic oral health 3rd molar will alleviate ache and other different symptoms associated with it. **(WHO,2011)**

The surgical extraction of mandibular 3rd molars is the maximum executed oral and maxillofacial surgical procedure all over the world. Radiography has always been used for a long time as a part of the preoperative evaluation before the extraction of the 3rd molar.

The need for radiographic evaluation of 3rd molars prior to the surgical operation is well-established. Performing a pre-operative radiograph will aid in finding out the easiest and least traumatic method for extraction of the mandibular 3rd molar. Thus, radiography before 3rd molar removal is an exercise which allows the health care provider to set up a formidable surgical remedy plan. Surgical extraction of the 3rd molars can also additionally traumatize the inferior alveolar nerve (IAN). **(Mcgrathetal,2003)**

To avoid the complications of third molar extraction, pre-operative radiographic exam is crucial to assess the orientation of impaction, deflection of the root, vicinity of the canal, courting of the canal to the roots, and thickness of the cortical plates. **(Savin Ogden,1997)**

The purpose of digital radiography is to generate images that can be used in the diagnosis and assessment of dental disease. Similar to film based radiographic procedures; digital radiography allows the radiographer to obtain a wealth of information about the teeth and supporting structures **(Iannuccin and Howerton,2006).**


CHAPTER ONE
REVIEW OF
LITERATURE

1.1.Anatomy of mandible

The mandible, lower jaw or jawbone is the largest, strongest and lowest bone in the human face **(Grays,2009).**

It forms the lower jaw and holds the lower teeth in place . The mandible sits beneath the maxilla . it is the only movable bone of the skull **(Tortora,2011).**

The lower jaw is the most inferior structure of the skull . It consists of body anteriorly and ramus posteriorly at the angle of the mandible it is considered as the largest and the strongest bone of the face which articulate with the skull at the temporomandibular joint it is a U shaped bone Which completes the skull and it is the only mobile bone of facial Skeleton **(Grays & Jahan- Parwar,2009).**

The mandible is composed of the body and the ramus and is located inferior to the maxilla. The body is a horizontally curved portion that creates the lower jaw line. The rami are two vertical processes located on either side of the body; they join the body at the angle of the mandible. At the superior aspect of each ramus, the coronoid and condylar processes articulate with the temporal bone to create the temporomandibular joint which permits mobility. Other than the ossicles of the ear, the mandible is the only skull bone that is mobile, allowing the bone to contribute to mastication. **(Lipski ,et al.,2013).**

1.1.1.Body of the Mandible

The body is somewhat curved like a hours shoe and has two surfaces, these surfaces are:

A_ The external surface which is marked by a faint ridge , indicating the symphysis . This ridge divides below and encloses a triangular eminence , the mental protuberance, the base of which is depressed in the center but raised on either side to form the mental tubercle. On either side of the symphysis, just below the incisor teeth, there is a depression The incisive fossae which gives origin of mentalis and portion of orbicularis oris muscle . Below the second premolar tooth on either side of the body of mandible is the mental foramen , running backward and upward from each from each mental tubercle a faint ridge the oblique line

which is continuous with anterior border of mandible which provides attachment to the quaderatouslabiiinferioris and triagularis the platysma attached below it **(Grays,2009).**

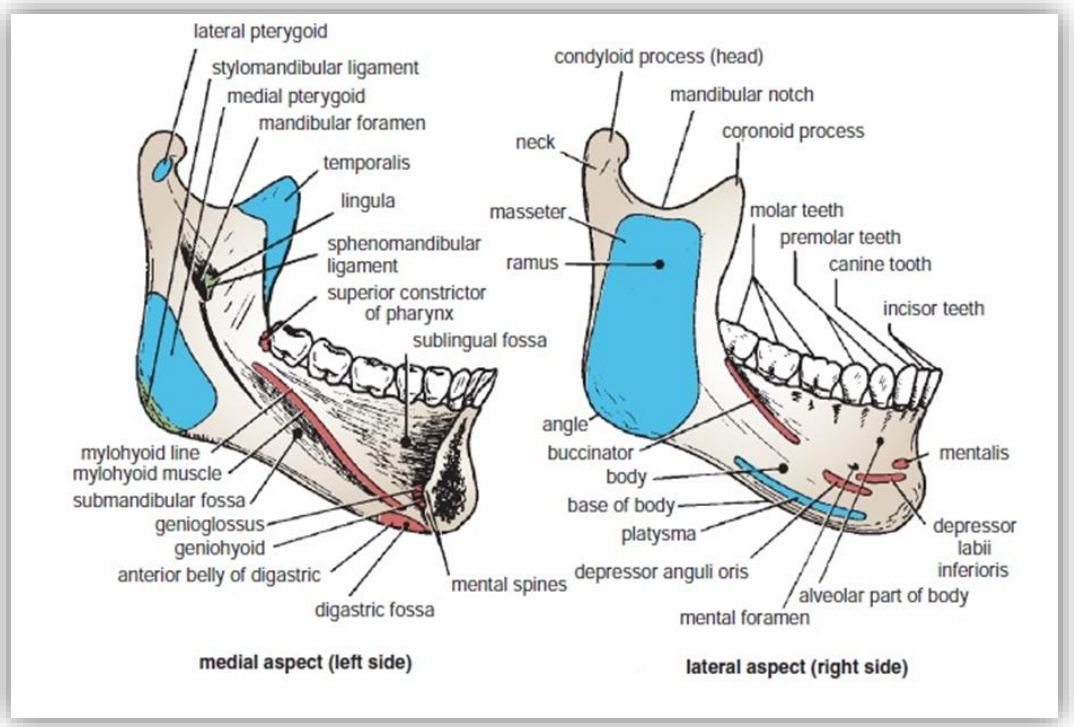


Figure (1-1) Anatomy of the mandible (Snell,2009).

BThe internal surface which is concave from side to side, near the lower part of the symphysis there is a pair of laterally placed spines , mental spine, which give the origin of genioglossi . Extending upward and backward on either side from the lower part of the symphysis is the mylohoid line , which gives origin of the mylohyoideus (Grays,2009). The body of mandible is divided into two parts:(**Snell,2007).**

1-The lower part is the base of the mandible.

2-The upper part is the alveolar part of the mandible which contains the teeth.

1.1.2.Ramus of the Mandible

The ramus of the mandible is quadrangular in shape and has medial and lateral surfaces; the lateral surface is generally smooth except from few obliquely oriented ridges for attachment of masseter **(Grays,2009)** On the medial surface there is the mandibular foramen . In front of the foramen is a projection of bone called linguala for attachment of sphenomandibular ligament. The foramen leads to the mandibular canal which opens on the lateral surface of the body of mandible at the mental foramen. The incisive canal is a continuation forward of the mandibular canal beyond the mental foramen and below the incisor teeth**(Snell,2007).**

The lower border of ramus is thick, straight, and continuous with the inferior border of the body of mandible ; by this junction it forms the angle of mandible. The ramus of mandible is vertically places and has an anterior coronoid process and a posterior condyle process; the two processes are separated by the mandibular notch **(Netter,1989).**

1.2.Third Molar

A wisdom tooth or third molar is one of the three molars per quadrant of the human dentition. It is the most posterior of the three.

The age at which wisdom teeth come through (erupt) is variable. but generally occurs between late teens and early twenties . Most adults have four wisdom teeth, one in each of the four quadrants, but it is possible to have none, fewer, or more, in which case the extras are called supernumerary teeth. Wisdom teeth may get stuck (impacted) against other teeth if there is not enough space for them to come through normally. While the impaction does not cause movement of other teeth(**McCoy,2012; Swift & Nelson,2012).**

There is significant variation between the reported age of eruption of wisdom teeth between different populations. For example, wisdom teeth tend to erupt earlier in people with African heritage compared to Asian and European heritage ; Eruption may start as early as age 13 in some groups **(Tsokos& Michael ,2008).**

The Third molar is the last permanent tooth that erupts between the ages of 17-25 and therefore it was called wisdom tooth representing the age of wisdom . The 3rd molar erupts distal to the 2nd molar . Most adults have four wisdom teeth, including two maxillary and two mandibular 3rd molars **(AAOMS,2010).** If they have not erupted by age 25, oral surgeons generally consider that the tooth will not erupt spontaneously by itself**(Swift & Nelson, 2012).**

The development of the 3rd molar dose not begin until ectodermal dental lamina migrates distally in the growing childs mouth to interact with jaw mesenchyme , and this interaction occurs at around five years of age **(Thesleff et al,1995;Ten Cate,1998).**

During the five years from birth to the initiation of 3rd molars, genetic factors and environmental factors influence jaw growth and dental lamina migration, which may ultimately affect the timing of interaction and the final position of the two tissues necessary for initiation of tooth bud development. For normal tooth patterning to occur in regard to size, shape and final postion, the two tissues must be in the right place at the right time **(Tuker and Sharpe,1999; Jernvall and Thesleff,2000)**.

Alteration in the pattern of jaw growth ,as well as changes in the migration of the dental lamina, due to evolutionary factors and environmental factors such as trauma and disease .Environmental factors and teratogens have been shown to affect tooth with devastating effect on the tooth size , shape and position, therefore aberrations in normal 3rd molar patterning frequently occur **(Silvestir ,2003).**

1.2.1.Impacted Mandibular Third Molar

Impacted tooth is a tooth which is completely or partially unerupted and is positioned against another tooth, bone or soft tissue so that its further eruption is unlikely, described according to its anatomic position **(Janakiraman et al ,2010).**

An impacted tooth refers to a tooth that has failed to emerge fully into its expected position. This failure to erupt properly might occur because there is no enough space in the persons jaw to accommodate the tooth, the tooth’s eruption path is obstructed by other teeth or because the

angulation of the impacted tooth is improper (**Obiechina,2003; Saglam, 2003; Obimakinde,2007).**

1.2.2.Etiology of Impaction

Various theories have been proposed on the etiology of impaction, these theories included : orthodontic, phylogenic and mendelion theories **(Obiechina,2003).**

Various causes have been suggested for the impaction of the third molar. It has been suggested that the gradual evolutionary reduction in the size of the human mandible/maxilla has resulted in too small mandible/maxilla that may accommodate the corresponding molars. **(Grover & Lorton ,1985)**

It has also been found that the modern diet does not offer a decided effort in mastication, resulting in loss of growth stimulation of jaws, and thus the modern man has impacted and unerupted teeth. It has been suggested that the major basic cause of aberrant/impacted teeth in the adults of Western Europe, Great Britain and Ireland, U.S.A, and Canada is due to artificial feeding of babies, the habits developed during childhood, due to cross breeding, more consumption of sweet food by the children and youth which produces disproportion in the jaws and thus the teeth. **(Matsuyama , et al.,2015 ; Ajith et al ., 2014).**

Wisdom teeth become impacted when there is not enough room in the jaws to allow for all of the teeth to erupt into the mouth. Because the wisdom teeth are the last to erupt, due to insufficient room in the jaws to accommodate more teeth, the wisdom teeth become stuck in the jaws, i.e., impacted. There is a genetic predisposition to tooth impaction. Genetics plays an important, albeit unpredictable role in dictating jaw and tooth size and tooth eruption potential of the teeth. Some also believe that there is an evolutionary decrease in jaw size due to softer modern diets that are more refined and less coarse than our ancestors'**. (Juodzbalys G, Daugela P,2013).**

The object of impaction may be soft tissue, dental hard tissue or bone ; however, inadequate space had been identified as the main cause of impaction **(Martin et al,1995).**

Many theories have been proposed for the high frequency of impaction on mandibular 3rd molar, these included reduced arch length between mandibular 2nd molar and ascending ramus due to consumption of refined carbohydrate , late mineralization and late physical

maturation of mandibular 3rd molar, however impaction is said to be as result of interplay of these factors **(Obinakinde ,2009).**

Several studies indicated that the modern man's play a role in 3rd molar impaction in comparison to the stone Age man's diet . The coarse nature of the stone Age man's diet, as compared to the modern man's relatively soft diet, probably required more activity of the chewing muscles. This activity could have stimulated greater jaw bone growth , thus providing more space for the wisdom teeth **(Glosser and Cambell,1999; Kruger et al., 2001).**

1.2.3.Prediction of impaction

It's difficult to predict the eruption of the mandibular 3rd molar due to the great variability and multiple factors that are affecting its eruption. Many studies have been done to predict mandibular 3rd molar eruption by using dissected skull or lateral cephalometric radiography mostly. However because of image superimposition, associated with cephalometric radiography, it is not very precise when trying to measure 3rd molar position and its possibility of eruption, therefore it was decided after conducting a careful study and babiliographic review to use panoramic radiography as it allowed to visualize both sides of the dental arch and measure the structures with the least amount of superimposition **(AbdulAmeer,2007).**

1.2.4.Classification of impacted third molar

All teeth are classified as either developing, erupted (into the mouth), embedded (failure to erupt despite lack of blockage from another tooth) or impacted. Impacted teeth are ones that fails to erupt due to blockage from other teeth. Wisdom teeth, as the last teeth to erupt in the mouth are the most likely to become impacted. They develop between the ages of 14 and 25, with 50% of root formation completed by age 16, and 95% of all teeth erupted by the age of 25, however, some tooth movement can continue beyond the age of 25(**Peterson et al ,2004).**

Impacted wisdom teeth are classified by the direction and depth of impaction, the amount of available space for tooth eruption. and the amount of soft tissue or bone (or both) that covers them.

The classification structure helps clinicians estimate the risks for impaction, infections and complications associated with wisdom teeth removal(**Juodzbalys&Daugela ,2013).** Wisdom teeth are also classified by the presence (or absence) of symptoms and disease **(Dodson,2012).**

One review found that 11% of wisdom teeth will have evidence of disease and are symptomatic, 0.6% will be symptomatic but have no disease, 51% will be asymptomatic but have disease present and 37% will be asymptomatic and have no disease**(Dodson,2012).**

Impacted wisdom teeth are often described by the direction of their impaction (forward tilting, or mesioangular being the most common), the depth of impaction and the age of the patient as well as other factors such as pre-existing infection or the presence of pathology (cysts, tumors or other disease)**(Peterson et al ,2004).**

Each of these factors is used to predict the difficulty (and rate of complications) when removing an impacted tooth, with age being the most reliable predictor**(Pogrel MA ,2012)** rather than the orientation of the impaction**(Bali et al,2013).**

Several methods have been described to classify impacted mandibular 3rd molar, the commonest method was described by **Obimakinde in 2009: In 1926** , Winter suggested a classification of impacted mandibular 3rd molar tooth based on the relationship of impacted tooth to the long axis of the mandibular second molar, he thus classified the different impaction position as:

1-Vertical

2-Mesioangular

3-Distoangular

4-Horizontal

5-Buccoangular

6-Lingoangular

7-Inverted

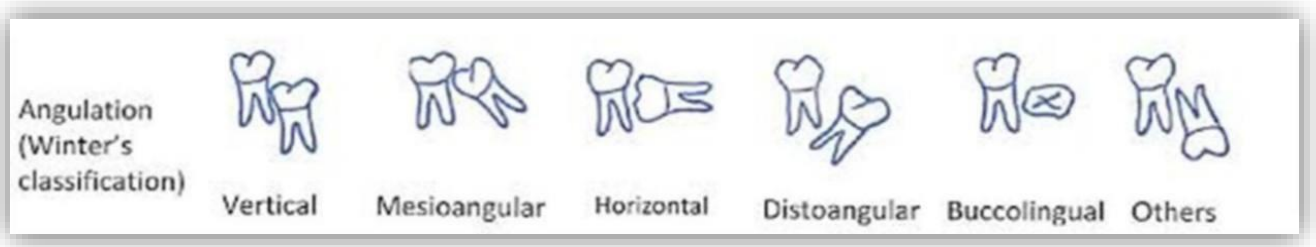


Figure (1-2) Winter's classification of impacted mandibular 3rd molar

Pell and Gregory in 1942 related the depth of impaction to the occlusal plane and cervical line of the mandibular second molar in one approach and the mesiodistal diameter of the impacted tooth to the space available between the distal surface of the second molar and the ascending ramus of the mandible in another approach. The various positions according to the depth of the impacted tooth were classified as the following:-

Position A:the highest portion of the impacted tooth is at the same level or above the occlusal plane of the second molar.

Position B: the highest portion of the impacted tooth is below the occlusal plane but above the cervical line of the second molar.

Position C: the highest portion of the impacted tooth is below the cervical line of the second molar.

The second category related to the impacted 3rd molar to the ascending ramus of the mandible and the second molar tooth and as follows:

Class1: there is sufficient amount of space between the ramus and second molar to accommodate the mesiodistal diameter of the crown of the impacted mandibular 3rd molar.

Class2: the distance between ramus and the distal surface of the second molar is less than the mesiodistal diameter of the crown of the 3rd molar.

Class 3: all or most of the crown of the impacted mandibular 3rd molar is within the ramus.

Killey and Kay in 1979 classified the state of eruption of the impacted 3rd molar and the number of the root into three categories, the tooth is thus classified as either:

1-Erupted

2-Partially erupted

3-Unerupted

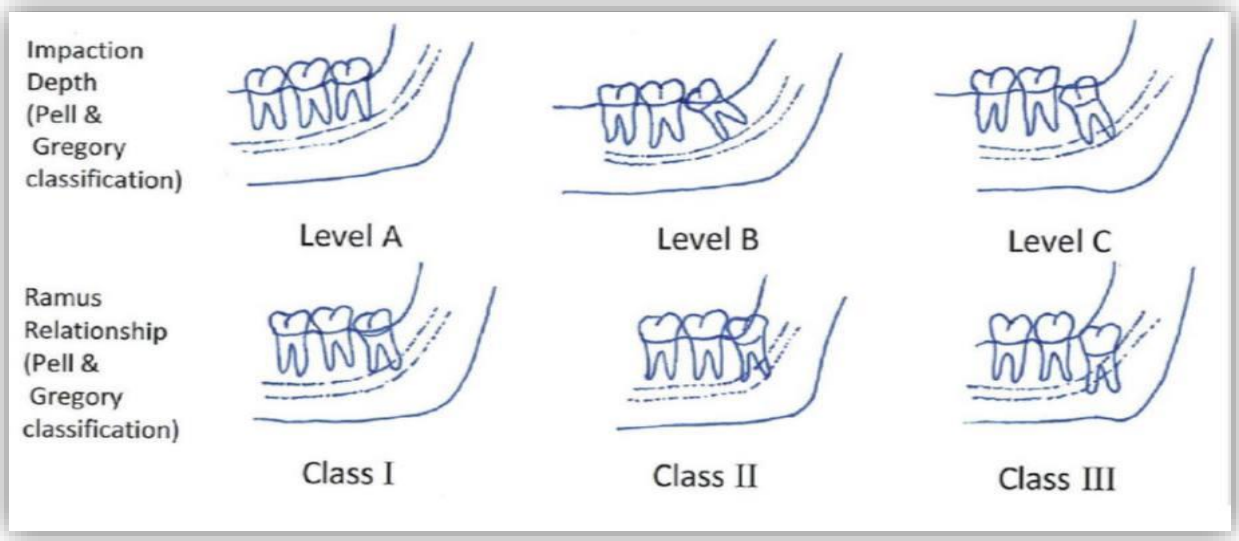


Figure (1-3) pell and Gregory classification of impacted mandibular 3rd molar (Jadu et al ,2016).

The number of the root may be two or multiple or the impacted tooth can also present with fused roots.

In addition of the above classifications ; the**American Association of Oral and Maxillofacial Surgeons (AAOMS)**in 1994 classified impacted teeth according to the surgical procedures required to remove them into four categories:-

1-Removal of tooth with only soft tissue impaction

2-Removal of tooth with partial bony impaction

3-Removal of tooth with complete bony impaction

4-Removal of tooth with complete bony impaction and unusual surgical complications.

Another classification system had been described to classify impacted tooth according to the nature of the overlying tissue **(Flick,1999).**

1-Soft tissue impaction when the height of the tooth's contour is above the level of alveolar bone and superficial portion of the tooth is covered by soft tissue.

2-Partial bone impaction when the superficial portion of the tooth is covered by soft tissue but the height of the tooth contour below the level of the surrounding alveolar bone.

Complete bone impaction when the impacted tooth is completely encased by bone.

1.3 Radiographical Detection Of Impacted Third Molar

1.3.1.Intraoral Periapical Radiograph

An intraoral periapical radiograph was earlier believed to be an adequate pre-operative assessment before surgical intervention of mandibular 3rd molars if the complete enamel and the mandibular canal are displayed within the radiograph. If there's an over-projection among the roots of the 3rd molar roots and the canal, additional examinations may be done and the tube shift approach within the vertical plane.**(LH Matzen J Christensen, 2003**)

It is useful in interpreting if the 3rd molar is placed buccally or lingually to the mandibular canal. Moreover, an axial/occlusal radiograph alongside with the tube shift radiographs aids in analysingbuccolingual inclination of the 3rd molar, and has been routinely advised.

In general, the sharpness of the intraoral periapical radiograph is better than that of the panoramic radiograph, and the magnification element while the usage of the paralleling approach is round 1.05 without any distortion.**(A Wenzel A Møystad, 1999)**

Owing to the problems in positioning the intraoral receptor for periapical exposures, many surgeons advocate that panoramic radiography can be the approach of preference as stated earlier for pre-operative assessment of mandibular 3rd molars.

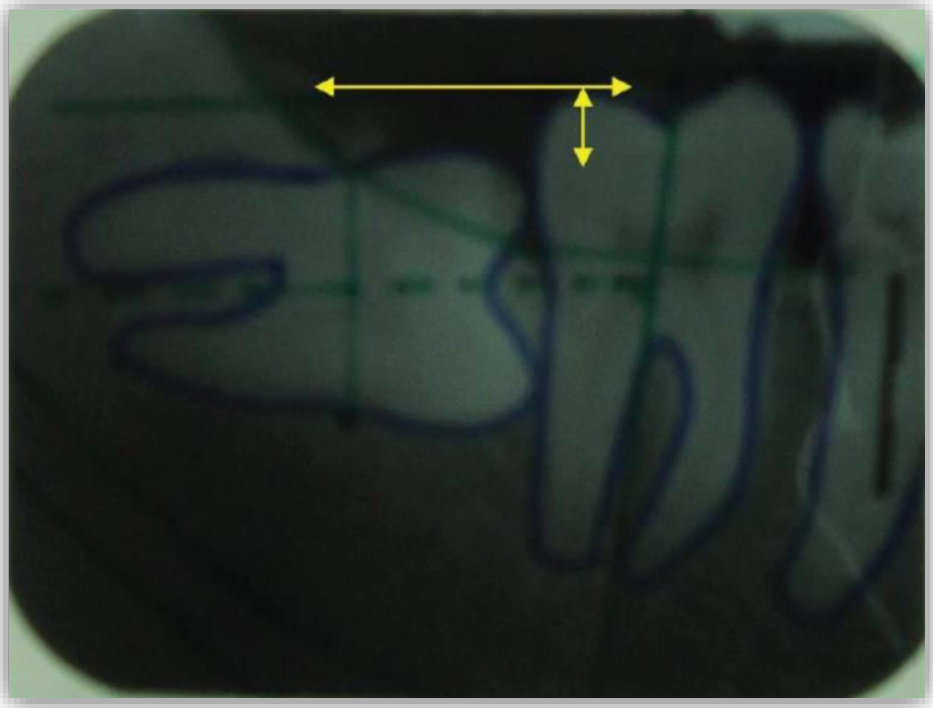


Figure 1.4: Radiological evaluation of impacted mamdibular third molar CBCT radiograph[L.H.Matzen,A.Wenzel,2015].

1.3.2. Panoramic radiography

Currently, the panoramic radiograph is the preferable radiographic approach to pre-operatively assess the impacted mandibular 3rd molars. panoramic radiography enables a preliminary assessment of any issues associated with impacted mandibular 3rd molar**.(M Sedaghatfaretal 2002).**

It is a known reality that for taking a peri-apical radiograph, positioning the receptor or sensor within the mouth is uncomfortable for the affected person. This is one of the frequently encountered problems which leads to inadequate radiographs. Panoramic imaging has therefore been recommended by few to be the primary-preference approach for pre-operative evaluation of 3rd molars. Several research have evaluated the diagnostic accuracy of the panoramic radiographic findings in figuring out vulnerability to IAN harm after extraction of the 3rd molars.

The panoramic radiography also has a known downside that it is eventually based on two-dimensional (2D) radiographs. Unfortunately, conventional x-rays, periapical and panoramic radiographs to exemplify, can simply offer restrained anatomical data and facts in relation to approximation of IAN to the 3rd molars, including and their association to the IAN canals**. (IN Badawyetal 2000)**

A comparison of the computed tomographic scan and panoramic radiography before mandibular third molar extraction surgery was done by **Luo et al.1998**, They aptly demonstrated that preoperative panoramic radiography, Computed Tomography (CT) scan, age, and the expertise of the health care provider can influence commonly expected postoperative sequelae after extraction of a mandibular 3rd molar. Panoramic radiography by itself is not sufficient to predict hypoesthesia of lips and/or chin. They encouraged the usage of CT scans to predict IAN damage after the surgical operation**. (Q Luo etal, 2005)**,Diagnostic credibility of cone beam computed tomography and panoramic radiography in predicting mandibular nerve damage during 3rd molar surgical operation has been evaluated by **Hasani et al. 2007) ,**In their research, the sensitivity of panoramic radiography was reported to be 67.8%. The most common radiographic factors with the best sensitivity were interruption of the mandibular canal border and abrupt canal narrowing. The Pell and Gregory classification, 3rd molar angulations, or 3-dimensional canal-apex relationships are appreciably related to clinically shown IAN problems. Panoramic radiography can also additionally omit

approximately a third of instances of the close association of the tooth and IAN. However, a properly done panoramic radiograph analysis is rather beneficial. It may possibly provide actual anatomical data, and must be executed seriously. Surgeons, however, must be aware about the restrictions of the radiographic markers of panoramic radiography and must not forget to undertake any additional designated imaging investigations in particular instances of 3rd molar surgery.

Figure 1.5: Radiological evaluation of impacted mandibular third molar by panoramic radiograph [Priya et al, 2016].

1.3.3.Cone Beam CT

Cone Beam CT (CBCT) three-dimensional (3D) offer advanced and extra designated facts as compared with traditional 2D radiographs. In yesteryears, improvement of the cone beam computed tomography device has caused a growth in its scientific use in dentistry and its specialties. It gives a much-decreased dose of radiation to the patient, has a low cost as compared to conventional CT, gives a higher quantity reconstruction and high-precision bone details.**(Ziccardi Zuniga, 2012)**,which is obviously lacking in the panoramic view. This makes it feasible to attain the correct vicinity of the impacted 3rd molar, and its relation to the adjoining IAN. CBCT makes it feasible to outline the form of impaction, the follicle size, the axial inclination of the 3rd molar, the relative buccal and palatal positions, the quality and

quantity of bone encompassing the enamel and its approximation and relation to adjoining 2nd molar and anatomical systems. **(Y Nakagawaetal 2015)**

The use of CBCT gives a detailed information of the anatomic association of 3rd molar roots and the inferior alveolar canal (IAC). However, only skilled and experienced surgeons coping with impacted 3rd molars with proof of proximity to the IAC on OPG may be able to determine the best remedy modality without CBCT. Since CBCT can show the 3rd molar in all anatomical planes, and the examiner is capable of scrolling via the sub-millimetre slices, it safely can be assumed that extra designated facts are obtainable in CBCT than in 2D imaging. While an over-projection of the mandibular canal through the roots of the 3rd molars is visible within the conventional 2D radiographs, the CBCT can display the precise association of the 3rd molar and the mandibular canal in all 3 sections. **(ZH Baqainetal , 2015)**

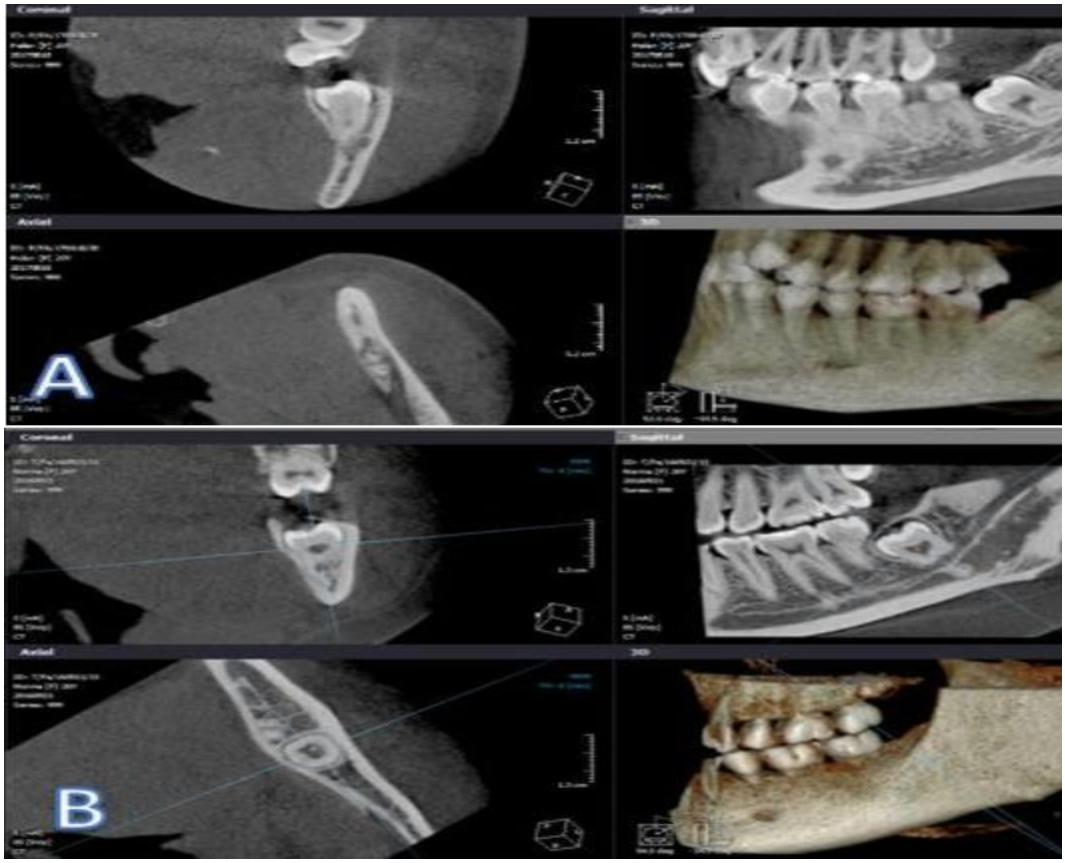


Figure 1.6: Radiological evaluation of impacted mamdibular third molar CBCT radiograph[L.H.Matzen,A.Wenzel,2015].

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Chapter two

Previous studies

Previous studies

Several methods have been described to classify impacted mandibular third molar; the commonest methods were described by **Obimakinde(2009):**

1-**In 1926, Winter suggested** a classification of impacted mandibular third molar tooth based on relationship of the impacted tooth to the long axis of mandibular second molar.

2-**Pell and Gregory in 1942** related the depth of impaction to the occlusal plane and cervical line of the mandibular second molar in one approach and the mesiodistal diameter of impacted tooth to the space available between the distal surface of second molar and ascending ramus of mandible in another approach.

3-**Killey and Key in 1979** classified the eruption state of the impacted third molar and the number of roots into three categories.

4-In addition of above classification; the American Association of Oral and Maxillofacial surgeons **(AAOMS) in 1994** classified impacted and unerupted teeth based on surgical procedure required to remove them rather than anatomical position of the teeth.

In an attempt to predict the probability of third molar eruption, many studies have been done; most of them done by dissected skull or lateral cephalometeric radiograph. However because of image superimposition associated with cephalometric radiography, it is not very precise when trying to measure the third molar position and its possibility of eruption, therefore, it was decided after conducting a careful study and bibliographic review to use panoramic radiography to predict third molar eruption. This allowed one to visualize both sides of the dental arch and measure the structures with the least amount of superimposition **(AbdulAmeer,2007).**

Several studies have been performed earlier to correlate the different radiographic modalities used in the diagnosis of impacted mandibular third molar. **Flygare and Ohman in 2008** suggested that OPG and/or IOPA suffice thepresurgical imaging needs in the majority of cases where there is no overlaping between the mandibular canal and the impacted molars of Mandible

Bjork in 1956 measured the distance that separate the anterior edge of the ramus and the distal surface of the second molar and suggested that the probability of impaction decrease as the distance increased.

Schulhof in 1976 evaluated several methods of measuring the available space. He concluded that the most useful method was to measure the distance available from the center of ramus (Xi) to the distal surface of the second molar, performed at the age of 8 or 9 years with 90% precision.The average distance were proposed by him were (21mm) for the impacted molar, (25mm) for erupted molar out of position and (30mm) for molar in occlusion.

Rickets in 1976 measured the distance from (Xi) to distal surface of the second molar at the level of the occlusal plane, using lateral cephalometric radiography. He concluded that a distance of 30mm was enough for the eruption of 3rd molar and a distance of 20mm or less was not enough.

In 1981, Olive and Basford used cephalometric radiograph to predict 3rd molar eruption, the occlusal plane and two perpendicular tangents (to the distal surface of the second molar and anterior edge of the ramus) were traced and the mesiodistal width of the 3rd molar was measured. If this is the same or less than the available space, the eruption possibilities were good; otherwise impaction was likely to occur.

Ricketts in 1972 supported **Bjork observation** ; he evaluated 100 skulls and reported that a successful eruption could be directly correlated with the portion of the 3rd molar that goes beyond the anterior edge of ramus, if half of the 3rd molar lies behind the ramus , the possibility of eruption is 50%.

The third molar impaction is occurring in about 73% of the young adults in Europe **(Matsuyama et al , 2015).**

Most studies reported a high frequency of mandibular 3rd molar impaction when compared to the other teeth followed by maxillary 3rd molar , maxillary canine and mandibular canine respectively **(Liedholm et al, 1999; Quek et al ,2003).**

The prevalence rate of impaction varies from one population to another and several author reported the prevalence rate ranging from 19.5% to 50% **(Kruger et al.,2001;Quek et al ., 2003).**

Most of the researchers suggest that the females have a higher incidence of mandibular third molar impaction when compared to males**. (Kruger et al, 2001; Juodzbalys&Daugela , 2013)**

The modern literature suggests that post-operative transient lack of IAN sensation associated with 3rd molar extraction degrees from 0.4% to 22%, whilst long lasting persistent harm to the IAN occurs in approximately 1% of the instances **(MA Atieb, 2017)**,Injury to the inferior alveolar canal which occurs during the execution of 3rd molar surgical operation relies upon numerous anatomical elements, like its vicinity and close association to the 3rd molar, angulation and orientation of impacted tooth, bone mass and density, age of the affected person, and surgical capability or expertise of the surgeon. Apart from harm to IAN, different other problems which may arise after the 3rd molar surgery include infection, contamination, delayed healing, and jaw fracture. These diverse problems can result in malpractice issues for oral surgeons. (**W Jerjesetal 2020)**

Chapter three

Suggestions

3.2. Suggestions

An impacted wisdom tooth is perceived to be a prevalent problem in dentistry. The occurrence of impaction has been rising over the years due to the less functional activity of the jaws. The incidence of impaction may differ from one race to the another depending on the genetically inherited factors, the type of food, and habits that may have a role in the growth of the jaws. Impacted and partially erupted third molars can result in several symptoms and pathologies such as bone loss, root resorption of adjacent teeth, odontogenic cysts and tumors, pericoronitis, and systemic infections. Presently, there is an argument in dental literature regarding the clinical management of impacted third molars.

Although the decision to remove symptomatic third molars is a straightforward one, the prophylactic removal of asymptomatic third molars remains a controversial issue

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