

**“RELATIONSHIP BETWEEN IMPACTED MANDIBULAR THIRD MOLAR AND
MANDIBULAR CANAL” DOES CONE BEAM COMPUTED TOMOGRAPHY
IMAGING PROMISE MORE EFFECTIVE DIAGNOSIS BEFORE EXTRACTION THAN
ORTHOPANTAMOGRAM? - A SYSTEMATIC REVIEW**

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ABSTRACT

BACKGROUND: Proper diagnosis of impacted mandibular third molars (IMTM) is essential to prevent injury at the site during extraction and aftermath surgical complications. OPG (Orthopantomograph) is the most common diagnostic aid followed nowadays. However, since the two dimensional imaging does not provide adequate details for diagnosis, CBCT (Cone-Beam Computed Tomography) is preferred in order to avoid such impediments as it provides higher quality imaging and makes the extraction procedure much easier with its ample detailing for diagnosis.

AIM: To compare preoperative radiography with cone-beam computed tomography in the assessment of the relationship between impacted mandibular third molar and mandibular canal.

METHOD: A systematic review of the records comparing panoramic radiography with cone-beam computed tomography for the pre-operative assessment of impacted mandibular third molar and its relationship with the mandibular canal was done. A literature review was performed using Medline, Pubmed, Science direct, and Cochrane. Total of 383 articles appeared from various sources; all articles were screened and 15 were related to the research question. This review was reported according to the PRISMA guidelines.

RESULTS: With the 15 articles included in the systematic review as qualitative synthesis, the presence of darkening of roots and interruption of the white line in OPG, as both separate findings and in association with each other are effective in influencing the risk relationship between IMTM and mandibular canal, which further certainly require a 3D evaluation (CBCT) before performing the surgery.

CONCLUSION: CBCT imaging provides much a promising evaluation in determining the relationship between impacted mandibular third molars and mandibular canal which is more useful than OPG imaging before the extraction to elude complications both during and after the procedure.

KEYWORDS: CBCT, OPG, Extraction, Systematic Review

INTRODUCTION:

Wisdom teeth (often called as 8's) are the third and the final set of molars to erupt in the oral cavity during the late teens or early twenties. Historically, they are called so because they come at a more mature age that people are said to become wiser and hence nicknamed "wisdom teeth". Anthropologists accept the fact that our ancestors had larger jaw size that helped them occupy many molars up to the 5th molars, which helped them grind on rough food like roots, leaf, nuts and meat that required more chewing power. With time, generation, and development of modern diet of softer foods along with prodigies of a modern technologies such as forks, spoons and knives, wisdom teeth slowly became nonexistent. Due to this, evolutionary biologists have classified wisdom teeth as 'vestigial organs', or body parts that have become functionless with evolution. Human jaws have become smaller throughout evolutionary history, so when wisdom teeth form, they often become impacted, or blocked by other teeth around them which do not let them erupt in the oral cavity. Also, if wisdom teeth partially erupt, food tends to get trapped in the gum that surrounds it, which in the process causes bacterial growth and simultaneously infection. They also can lead to problems such as crowding and displacement of other permanent teeth. Generally, these third molars erupt in the oral cavity at the age of 17-24 years¹.

Very rarely, cyst (fluid-filled sac) formation in the soft tissue surrounding the impacted wisdom teeth can also occur, leading to bone destruction, jaw expansion ultimately damaging the surrounding teeth. Even more uncommonly, tumors can develop from the cysts causing pathological fracture of the jaws if the tumor or cysts exceeds growth.

Wisdom teeth can be removed at any age if once it has been identified to start creating problems. However, it is best to have it extracted between the age of 18 and 24. Another main factor influencing its removal from the oral cavity is when the root has developed to about two-thirds of its full size (which maybe sooner or later than 18), depending from individual to individual. After the age of 24, the roots of wisdom teeth are fully formed leading to complex extraction procedures.

The removal of wisdom teeth at older ages may require even more complicated surgeries where the healing time could be slower with high risks of complication.

Impacted third molars occur in both maxillary and mandibular jaws. Adequate diagnosis is essential before the extraction procedure to prevent any complication. Panoramic radiography or Orthopantomograph (OPG) is the most common diagnostic aid for third molar surgeries. It is commonly used to evaluate the type of impaction, angulation, and morphology of roots. Nevertheless, the spatial relationship between the mandibular canal and impacted mandibular third molars (IMTM) cannot be assessed using panoramic radiographies¹¹. Since it provides only a two-dimensional view, the vicinity of the tooth is not as accurate as 'Cone-beam Computed Tomography (CBCT)', which provides higher quality imaging in three-dimensional views. It has higher special resolution, and radiation from CBCT is also minimal when compared to medical computed tomography⁸.

IMTM are the most commonly impacted teeth in the oral cavity. According to a study, third molar impactions are occurring in about 73% of the young adults in Europe². Its surgical removal could lead to several postoperative complications if it is not removed atraumatically. Because of its location (closer to the mandibular canal / inferior alveolar canal (IAC), it has been proven that impacted third molars are the main reason for permanent paralysis of the inferior alveolar nerve. The nerve injury ranges from 0.6 to 5.3% with permanent injury <1% of patients³.

Although OPG offers wider-ranging coverage and easy access, detecting the meticulous proximity of the IMTM to the IAC in patients is not possible. Therefore, it is essential to extend the analysis by preferring CBCT. This systematic review aims at highlighting the benefits of CBCT by comparing its accuracy with OPG in patients who have their IMTM in close approximation with mandibular canal before surgery. The criteria such as 'presence' or 'absence' of corticalization around the IMTM in both diagnostic imaging techniques are compared and evaluated.

MATERIALS AND METHODS

STUDY DESIGN:

Systematic review of the records comparing Panoramic Imaging (OPG) and Cone Beam Computed Tomography (CBCT) for pre-operative assessment of impacted mandibular third molars with mandibular canals.

OBJECTIVE:

To compare panoramic radiography with cone-beam computed tomography in the assessment of the relationship between impacted mandibular third molars and mandibular canals.

SEARCH ENGINES:

- PUBMED
- ELSEVIER SCIENCE DIRECT
- COCHRANE LIBRARY
- WILEY ONLINE LIBRARY
- Other additional sources

SEARCH STRATEGY:

All the published articles which compared the diagnostic value of Cone Beam Computed Tomography with Panoramic Radiography in the assessment of relationship between Impacted Mandibular Third Molar and Mandibular Canal pre-operatively. Articles from databases such as PubMed, Elsevier Science Direct, Cochrane library, Wiley online library and additional sources were included in the review. The articles were searched to collect the relevant data using MeSH terms, "Cone-Beam Computed Tomography, Panoramic Radiography, Impacted Mandibular Third Molar and Mandibular Canal". According to the PRISMA guidelines, the MeSH terms were altered in each search engine, where the results produced were many or too few.

INCLUSION CRITERIA:

- Studies comparing pre-operative evaluation of IMTM with mandibular canals with OPG and CBCT.
- Studies with only clinical trials.
- Studies showing corticalization between mandibular third molar and mandibular canal.

EXCLUSION CRITERIA:

- Review articles.
- Articles proving only CBCT & only OPG as parameters.
- Other parameters apart from CBCT and OPG.
- Other structures apart from mandibular canal with impacted mandibular third molar.
- Other teeth apart from mandibular third molars.
- Pilot studies and RCT.
- Other lesions and their surgeries.
- Post-Operative studies comparing OPG with CBCT.
- Apart from corticalization, other criteria were analyzed.
- Animal studies.

RESULTS:

A total of 383 publications based on the topic were identified. Of these, 23 were detected as duplicated and extracted. After extraction of the duplicates, the remaining articles were screened thoroughly and 20 full text articles were independently assessed. With the application of exclusion criteria, 15 studies were included in the systematic review as qualitative synthesis. Fig 1 shows the flow diagram of the above work down.

FIG 1: FLOW DIAGRAM SHOWING THE NUMBER OF STUDIES IDENTIFIED, SCREENED, ASSESSED FOR ELIGIBILITY, EXCLUDED AND INCLUDED IN THE SYSTEMATIC REVIEW

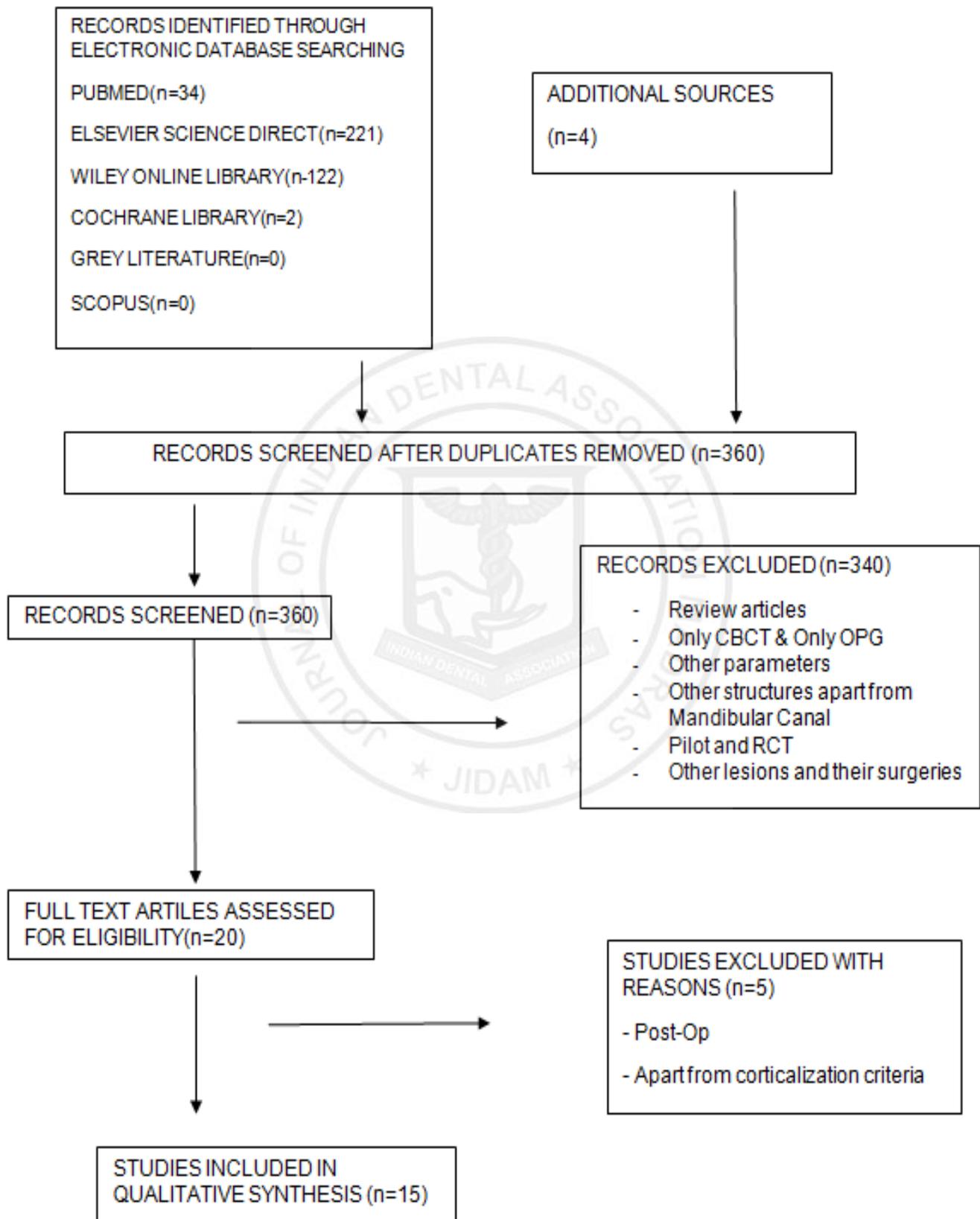


TABLE 1: CHARACTERISTICS OF INTERVENTIONS IN THE INCLUDED STUDY

AUTHOR	YEAR	SAMPLE SIZE	PATIENT CHARACTERISTICS	NUMBERS (CASE/ CONTROL)
Daniela Guimardes de Melo Albert et al ⁴	2006	19 individuals (24 teeth, 14 right side and 10 left side)	9 males and 11 females with impacted mandibular third molars.	24 teeth were assessed with OPG and compared with CBCT
Weeraya Tantanapornkul et al ⁵	2007	135 individuals (142 teeth)	50 males and 85 females with impacted mandibular third molars.	142 teeth were assessed with OPG and compared with CBCT
Kenji Nakamori et al ⁶	2008	443 individuals (695 teeth)	247 males and 196 females with impacted mandibular third molars.	576 OPG and 119 were compared with CBCT
H.Ghaemina et al ⁷	2009	42 individuals (56 teeth)	20 males and 22 females with impacted mandibular third molars.	56 teeth were assessed with OPG and compared with CBCT
Shravan Kumar Katakam et al ⁸	2012	30 individuals (42 teeth)	11 males and 19 females with impacted mandibular third molars.	42 teeth were assessed with OPG and compared with CBCT
F S Neves et al ⁹	2012	72 individuals (142 teeth)	28 males and 44 females with impacted mandibular third molars.	142 teeth were assessed with OPG and compared with CBCT
Shoaleh Shahidi et al ¹⁰	2013	96 individuals (132 teeth)	46 males and 50 females with impacted mandibular third molars.	132 teeth were assessed with OPG and compared with CBCT

Ilkay Peker et al ¹¹	2014	191 individuals (298 teeth)	68 males and 123 females with impacted mandibular third molars.	298 teeth were assessed with OPG and compared with CBCT
Saraydar-Baser R et al ¹²	2015	60 individuals (right side 41, left side 19)	28 males and 32 females with impacted mandibular third molars.	60 individuals (right side 41, left side 19) were assessed with OPG and compared with CBCT
Larissa Rangel Peixoto et al ¹³	2015	50 individuals (73 teeth)	26 males and 24 females with impacted mandibular third molars.	73 teeth were assessed with OPG and compared with CBCT
Mahmuda Akter et al ¹⁴	2016	60 individuals	60 individuals with impacted mandibular third molars.	60 individuals were assessed with OPG and compared with CBCT
Sonali Ghai et al ¹⁵	2017	60 individuals (53 teeth)	60 individuals with impacted mandibular third molars.	53 teeth were assessed with OPG and compared with CBCT
Kate L. Winstanley et al ¹⁶	2017	55 individuals (100 teeth)	15 males and 40 females with impacted mandibular third molars.	10 teeth were assessed with OPG and compared with CBCT
Darshana S Nayak et al ¹⁷	2018	24 individuals (40 teeth)	5 males and 19 females with impacted mandibular third molars.	40 teeth were assessed with OPG and compared with CBCT
Vinay Kumar Reddy Kundoor et al ¹⁸	2018	40 individuals (60 teeth)	16 males and 24 females with impacted mandibular third molars.	60 teeth were assessed with OPG and compared with CBCT

TABLE 1 shows the characteristics of intervention in the included studies. In all the 15 studies, the accuracy of CBCT images were compared with OPG images in a controlled group which differed in sample size, gender and number of impacted teeth diagnosed. Only the OPG which showed IMTM having close approximation with mandibular canal were further preferred for taking up CBCT diagnosis.

TABLE 2: OUTCOME DATA AS REPORTED IN INCLUDED STUDIES

AUTHOR	YEAR	EFFECT MEASURE	RESULTS	P VALUES
Daniela Guimardes de Melo Albert et al ⁴	2006	Darkening of the root, narrowing and deviation of the canal, narrowing and bifid apices from OPG were compared with CBCT and evaluated.	Darkening of roots (92.1%) was majorly seen in CBCT along with narrowing of mandibular canal (12.9%) and apex.	Not Mentioned
Weeraya Tantanapornkul et al ⁵	2007	Interruption of the mandibular canal wall, darkening of the root, diversion of the mandibular canal, and narrowing of the root in Panoramic radiography was evaluated using logistic regression. The sensitivity and specificity between OPG and CBCT was also calculated.	The interruption of the mandibular canal was proved as diagnostic criterion of OPG image to predict the neurovascular bundle during extraction. Also the a) sensitivity of CBCT was 93% and b) specificity 77% which was far superior to that of OPG.	a)p<0.05 b)p<0.05
Kenji Nakamori et al ⁶	2008	Darkening, deflection and narrowing of the root, narrowing and diversion of the canal and interruption of the white line from OPG were compared with CBCT for presence and absence of cortication. Chi- squared and Logistic regression was carried out.	There was significance for a) darkness of the root, b) diversion of the canal and c) narrowing of the canal.	a) p=0.049 b) p=0.019 c) p=0.003
H.Ghaemina et al ⁷	2009	Patients with close relationship between IMTM and Mandibular canal in OPG were asked to take CBCT. Darkening of the root, interruption of white line of the mandibular canal, diversion and narrowing of the canal were evaluated with Chi-Squared (X ²) test. Less than 0.05 were considered	Only darkening of the root showed significant association with Inferior Alveolar Nerve exposure and Odds ratio (0.204).	p=0.007

		statistically significant. Logistic regression was then carried out.		
Shravan Kumar Katakam et al ⁸	2012	Darkening and deflection of roots, narrowing of apex and the canal, deviation of canal, deflection of white line and bifid apices from OPG were evaluated and compared with CBCT. Chi-squared and Z test was performed.	Z-value >1.5 in darkening of roots (1.98), deflection of root (2.00), z-value = 0 in narrowing of canal and dark, bifid apices. Also it showed significant p-value in all the radiographic signs except narrowing of mandibular canal, dark and bifid apices.	p<0.05
F S Neves et al ⁹	2012	Comparing the Panoramic radiography and CBCT findings according to the relationship between the roots of the third molars and the mandibular canal using Fisher's exact test, with a significance level of p<0.05.	a)Darkening of roots and b) interruption in white line, as both isolated findings and c)in association with each other revealed a statistically significant association with the absence of corticalization between the mandibular third molar and the mandibular canal in CBCT images	a)p=0.0001 b) p=0.0006 c)p=0.002
Shoaleh Shahidi et al ¹⁰	2013	The presence or absence of direct contact on the Panoramic radiographs was evaluated by the following four features, to find out the close contact between the tooth root and the mandibular canal: (a) interruption of the mandibular canal wall, (b) darkening of the root,(c) diversion of the mandibular canal, and(d) root dilacerations using logistic regression	Interruption of the cortical lines on a panoramic image raised the risk of root and canal contact on CBCT images (odds ratio=5.75) and showed the highest sensitivity among the four signs of association. However darkening of roots, diversion of mandibular canal and root dilacerations also increased the risk of association between the tooth and the canal in CBCT.	Not Mentioned
Ilkay Peker et al	2014	Darkening of the roots,	There was a significant	p<0.05

11		diversion of the mandibular canal, narrowing of the mandibular canal and interruption of the white line on Panoramic radiography were compared with CBCT and evaluated by chi-square and Fisher's exact tests, with a significance level of $p < 0.05$.	association between darkening of the roots and interruption of the white line on Panoramic images and the presence of contact between the IMTM and the Inferior Alveolar Canal (IAC) on CBCT images ($p < 0.05$).	
Saraydar-Baser R et al ¹²	2015	Darkening and contraction of the tooth root, suspension of the white cortical line of the IAC, deviation or bending of the IAC, Dark and bifid root apex, island-shaped apex, bending of the root and contraction of the IAC from OPG were compared with CBCT for surgical outcomes. Chi-squared, Fisher's tests were done along with sensitivity and specificity.	a) Deflection and curvature of the root, a) dark bifid root apex near the nerve, and c) an island-shaped apex in OPG showed a significant agreement with the results of surgical findings respectively. d) CBCT results with the surgical results was evaluated at a Kappa of 0.813, which is important at ($p = 0.001$). The sensitivity of CBCT was found to be 100% and specificity 94% in this study.	a) $p = 0.022$ b) $p = 0.027$ c) $p = 0.007$ d) $p = 0.001$
Larissa Rangel Peixoto et al ¹³	2015	Darkening, deflection, superimposition and narrowing of the root, diversion of the canal, interruption of the cortex and bifid apexes from OPG were compared with CBCT findings. True and False positive responses were calculated.	The "True Positive" response for darkening of the roots and interruption of the cortex with the canal was 9, superimposition of the root showed 5 whereas diversion of the canal showed 2 and narrowing of the root a) The P value significance between the three modalities were also found (original, inverted	a) $p = 0.981$

			and edge enhanced).	
Mahmuda Akter et al ¹⁴	2016	Darkening of roots and narrowing of mandibular canal from OPG to evaluate which type of impaction had close relationship with mandibular canal. This was later compared with CBCT findings.	The results show that darkening of roots showed majority of them in buccal position and concluding that horizontally impacted mandibular third molars have intimate relation with inferior alveolar canal.	Not Mentioned
Sonali Ghai et al ¹⁵	2017	Darkening of the root, deviation and narrowing of the canal, narrowing and deflection of the root, interruption of the white line, dark and bifid root apices from OPG were compared with CBCT with the presence and absence of corticalization.	Darkening of the root (DR) being the most common 22.64% while Interruption of White Lines (IWL) being the second most common 18.86% panoramic radiographic finding, when compared with CBCT, absence of corticalization was most commonly associated with DR and IWL, seen in 70% of cases.	p<0.05
Kate L. Winstanley et al ¹⁶	2017	Interruption of the white line of the canal, tooth touching white line of the canal, darkening, narrowing and deflection of the roots, narrowing and deflection of the canal from OPG were compared with CBCT. Chi-squared and Fisher's exact tests were carried out with significance set at P < .05.	a) Darkening of the roots (N = 22) and b) interruption of the white line (N = 47) were found to be significant.	a)p=0.041 b)p=0.024
Darshana S Nayak et al ¹⁷	2018	Darkening of roots, deflection of the apex, dark and bifid apices, deviation and narrowing of the canal from OPG was compared with CBCT. The CBCT images were also evaluated in axial, sagittal, and coronal planes to determine true relationship between the tooth and the	Darkening of the apex (n=13, 56.5%) and narrowing of the canal (n=4, 17.4%) were the signs most frequently associated with a true relationship on CBCT. P value significance was	a)p< 0.001 b)p=0.001 c)p< 0.001

		canal in which radiographic signs represent a true relationship. Statistical analysis was carried out using Chi-square test of significance P value <0.05.	calculated in three sections, namely, a) the coronal section, b) sagittal and c) axial section.	
Vinay Kumar Reddy Kundoor et al ¹⁸	2018	The association of Panoramic radiography and CBCT findings were analyzed using Chi square test and Fisher's exact test for darkening of the root, interruption of the mandibular canal, and contact of canal to root.	a) Panoramic radiographic signs were statistically associated with the buccolingual position of the mandibular canal relative to the impacted mandibular third molar on CBCT. Contact with the canal was more frequently observed when the interruption of the mandibular canal and darkening was seen on the panoramic radiographs.	a)p< 0.01

TABLE 2 shows the outcome data of accuracy and reliability of CBCT diagnosis prior to the IMTM removal to prevent post-surgical complications. All the 15 studies discussed had the same criteria (corticalisation) assessed.

TABLE 3: TECHNICAL CBCT DATA AND FURTHER INFORMATION FROM THE INCLUDED STUDIES

AUTHOR	CBCT SYSTEM	SCAN SETTING	IMAGE RESOLUTION	OTHER INFORMATION
Daniela Guimardes de Melo Albert et al ⁴	CommCat 752 (Imaging Sciences Corporation)	Information not provided	12.7 x 30.5 size	Information not provided
Weeraya Tantanapornkul et al ⁵	3DX multi image micro CT	80Kv, 2mA and 17 seconds	240 voxels height, 320 voxels diameter and isotropic cubic voxels with sides 0.12mm	Information not provided
Kenji Nakamori et al ⁶	Information not provided	Information not provided	Information not provided	Information not provided

H.Ghaemina et al ⁷	Classic i-CAT CBCT unit (Imaging Sciences International)	120 kVp, 3–8 mA and 20 seconds	Field of view 6cm and voxel size 0.25mm	Information not provided
Shravan Kumar Katakam et al ⁸	Siemens volume access multislice spiral CT	120kVp, 90mA	0.75 mm slice thickness	Images reconstructed in sharp kernel H60S in dental window
F S Neves et al ⁹	Classic i-CAT CBCT unit (Imaging Sciences International)	120kVp/8mA	0.25mm voxel size and field view of 8cm	Information not provided
Shoaleh Shahidi et al ¹⁰	Kodak 9000	90 kVp, 6mA, and 10 seconds	Information not provided	Information not provided
Ilkay Peker et al ¹¹	Promax 3D unit (PlanmecaOy, Helsinki, Finland)	84 kVp, 9–14 Ma,6 seconds	0.16 mm voxel size and a field of view of 8 cm	Information not provided
Saraydar-Baser R et al ¹²	PromaxPlanmeca	80Kvp, 12mA for17 seconds	Information not provided	Information not provided
Larissa Rangel Peixoto et al ¹³	Siemens AG	110Kvp and 1.60-8.21mA	high-resolution gray-scale SMM Series monitor was used	Information not provided
Mahmuda Akter et al ¹⁴	Information not provided	Information not provided	Information not provided	Information not provided
Sonali Ghai et al ¹⁵	ORTHOPHOS XG 3D imaging system	60–90kVp, 9–12mA	100 lm Voxel size and 50*55 mm	Information not provided
Kate L. Winstanley et al ¹⁶	i- CAT Next Generation imaging system (Imaging Sciences International)	120 kV, 5 mA ,14.7 or 26.9 seconds	Information not provided	Information not provided
Darshana S Nayak et al ^{13,17}	Planmeca Promax3D	96Kvp and current 10mA	Size thickness 1mm in axial, coronal and sagittal view	Information not provided

Vinay Kumar Reddy Kundoor et al ¹⁸	New Tom Cone Beam 3D imaging	120 kVp, 8mA	0.2mm voxel size and field view of 8 cm	Information not provided
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TABLE 3 shows the CBCT data and other information from included studies

DISCUSSION:

This systematic review is based on 15 clinical studies to find the effects and reliability of CBCT over OPG. Many other studies that also compared the same or proved the effectiveness were not included due to the reasons already mentioned in Fig 1 (exclusion criteria). The studies in which the criteria of 'Corticalisation' was used to assess the relationship between IMTM and the mandibular canal was considered to be the main factor for including them in this systematic review. However, the results of these studies were almost similar stating that CBCT is the most accurate method for diagnosis than OPG before the removal of IMTM to prevent IAC injury and post-operative complications.

There is evidence which states that the presence of darkening of roots and interruption of the white line in OPG, as both separate findings and in association with each other is effective in influencing the risk relationship between IMTM and mandibular canal, which further certainly requires a 3D evaluation (CBCT) before surgery^{3,6,9,10,13,15,16}. The darkening of the root describes an increased radiolucent feature with the impingement of the canal over the third molar area and the strongest sign for IAN exposure and post-operative paresthesia¹⁹. It is also proven that there could be marked thinning or perforation of the cortical plates¹³. However, diversion and narrowing of the mandibular canal and root dilacerations also increased the risk of association between the tooth and the canal in CBCT^{4,10,14}. There was also a noteworthy difference in the number of roots of IMTM and the position (buccolingual) of the canal detected on OPG versus CBCT imaging, proving that OPG diagnosis solitarily is not sufficient^{11,18}. Darkening of the roots along with the narrowing of apices was also one of the common OPG findings which instigated the need for CBCT confirmation^{8,17}. The sensitivity and specificity of CBCT was found to be far superior compared to OPG in various studies^{5,12}.

According to the authors, the 3D examination of CBCT should be carried out when darkening of roots, narrowing of the mandibular canal, and interruption of white line is observed on OPG⁹⁻¹⁸. However, the predictability in judging the nerve lesion during the procedure and post-operative complication, with the consideration of the socioeconomic status, and the high cost, the use of OPG pre-operatively before third molar surgery is clearly justified¹⁸. CBCT depicts nearness of the IMTM to neighboring anatomical structures precisely which helps in creating good surgical plan and predicting post-operative complications which is of extreme importance in the period of medico-legal consumerism¹⁰. Nonetheless, OPG acts as a valuable guide in depicting mandibular third molars when used in stepwise logistic manner⁸.

LIMITATIONS:

Although the use of CBCT for the diagnosis of IMTM prior to its surgical removal is 100% accurate and effective, the cost factor being its major drawback would result in negligence in the use of it.

CONCLUSION:

With the above-discussed articles in which the significance of CBCT was proven statistically more essential than OPG method of diagnosis, we could conclude that CBCT evaluation in determining the relationship between impacted mandibular third molar and mandibular canal is more useful than OPG imaging before the extraction of the tooth as it majorly avoids complications both during and after the procedures.

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Nil

CONFLICTS OF INTEREST:

There are no conflicts of interest.

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