

# Clinical and Radiological Correlation with Surgery of Third Mandibular Impacted Molars

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## Abstract

**Overview:** Tooth extraction is one of the most common procedures in dentistry and oral maxillofacial medicine. Vigilant investigation of the condition and an accurate preoperative assessment, planning, evaluating indications and contraindications, is needed in all the cases.

**The objective:** The aim of this study is to evaluate the role of radiographic examinations in diagnosis and surgery planning of lower third molar extraction.

**Materials and methods:** Review of literature; on pubmed, medline, embase, sciencedirect, and the Cochrane library, using key words of impacted molars, third molars, mandibula, alveolar, dentistry, oral maxillofacial.

**Results:** During dental and oral maxillofacial daily clinical practice is quite often to face impacted third lower molars, a condition that can lead to a close relation with important anatomical structures. Radiographic examinations are useful in the diagnosis and subsequently in the surgery planning and must submit to principle of justification and optimization. Intraoral radiography and orthopantomography hardly permit to evaluate the buccal or lingual position of the inferior alveolar nerve so to better predict the risk of complications. There are some radiographic signs that suggest the necessity to perform a more accurate radiographic investigation that provides a three-dimensional view of the images. The three-dimensional radiographic methods, by means of sagittal, frontal and axial views, are used to determine anatomical location, proximity, and possible contact of the third molar with the mandibular canal, blood vessels and nerves branches. The beginning of Cone Beam Computed Tomography (CBCT) has reduced the equipment cost but then again above all the radiation exposure for the patients.

**Conclusions:** In the past few years three-dimensional reconstructive technologies were introduced: besides advantages, in addition to the potential benefit in the reduction of complications related to the patient, also resides in the different approach of the surgeon: stress and duration of dental and oral maxillofacial surgical procedures significantly is reduced because the respective medical specialist know exactly the position of anatomical structures. This information will help the surgeon to determine a possible post-operative paresthesia and plan the better surgical technique.

**Keywords:** Impacted molars, third molar, surgery, inferior alveolar nerve, OPT, CBCT

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## Introduction

Ten million impacted wisdom teeth are extracted each year from 3.8 million people, 94 % by oral and maxillofacial surgeons, and studies indicate that approximately 0.33 % to 1 % or 12,500 to 38,000 of patients suffer permanent injury, mostly damage to the mandibular or lower jaw nerve, resulting paresthesia of the lip, chin, distortion of talking and smiling, cheek biting, struggle chewing, and in other cases, severe shooting neuralgic pain.<sup>1</sup> Tens of thousands of people might also suffer lingual nerve and temporomandibular joint injury. Furthermore, 1/3 molar extractions are not impacted teeth, they will grow into normal position if left alone. Oral medicine surgeons contend that early extraction, before teeth are erupted and fully formed, reduces the pain of surgery and risk of injury, however, this contention is not evidence-based. On average, patients suffer over two days of pain, disability, loss of school and work, following uncomplicated extraction of wisdom teeth, at least two-thirds of which is unnecessary.

In respect to radiographic signs, there are three main radiographic signs that should be well understood by medical specialists who deal with impacted teeth treatments; First; interruption of the radiopaque line; second diversion of the inferior alveolar nerve - IAN canal; and third narrowing of the IAN canal.<sup>2</sup> These signs are appreciated in presurgical evaluation of the risk of postoperative sensory impairment after surgical removal of impacted mandibular third molar.

The 3D radiographic methods, by means of sagittal, frontal and axial views, are used to determine anatomical location, proximity, and possible contact of the third molar with the mandibular canal, blood vessels and nerves branches. The beginning of Cone Beam Computed Tomography – CBCT, (illustrated in figure 1), has

reduced the equipment cost but then again above all the radiation exposure for the patients.



Figure 1. Cone Beam Computed Tomography (CBCT)

### Discussions

The Association of Oral and Maxillofacial Surgeons of America contends that periodontal disease may originate wisdom teeth, probably leading to heart disease and other illnesses; they should be removed at early stage. This is a debate among many authors as this does not apply in respect of other nosology, like appendix, gall bladder, cervix uteri, ovaries, or breast, so this debate that surgery as primary medical care option to prevent future pathology is irresponsible, and undistinguishable from malpractice, therefore a possible unneeded ethic legal problem as well.

In Albania, intraoral or panoramic x ray (illustrated in figure 2) are the most mode of use of imagery diagnostic tool used in dentistry or oral and maxillofacial medicine, however the novel modes of imagery 3 D images prevail in quality of image and therefore in better outcome of medical care in general, therefore should be part of clinical practices in respective of medical indications.

Dental cone beam computed tomography - CBCT is a special type of x-ray equipment used when regular dental or facial x-rays are not sufficient. This technology to produce three dimensional images of the teeth, soft tissues, nerve pathways and bone in a single scan.

Advantages of CBCT over CT, is in respect of high radiation dose, availability, scanning time, poor resolution and difficulty interpretation have led to restricted use of CT in dentistry and oral maxillofacial medicine. Few of these problems can be avoided with use of CBCT, which provides a number of potential advantages for oral and maxillofacial imaging compared with conventional CT.<sup>3</sup>



Figure 2. Panoramic x ray

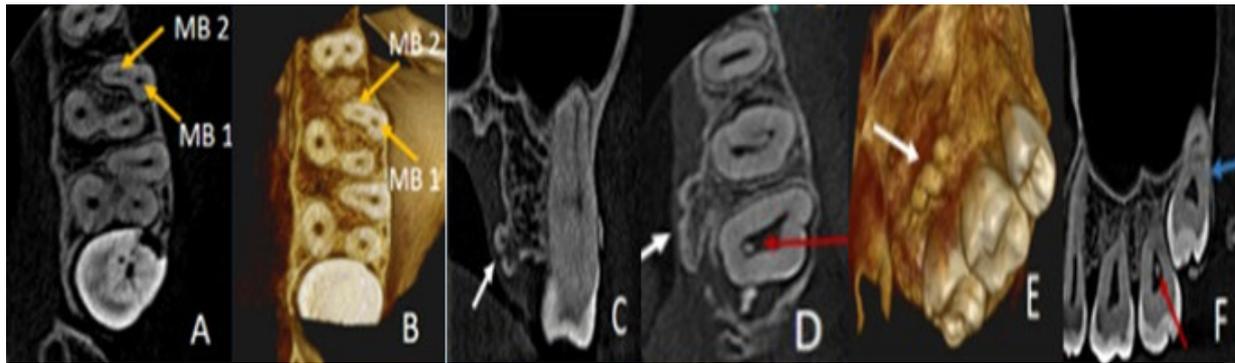


Figure 3. cone beam computed tomography - CBCT

Indication for extraction of third molars can be divided in three categories; first; therapeutic, where in these cases the tooth presents with an inflammatory pathology, or in case of treatment of disease that has cause this medical problem or its complications. Second; cosmetic or strategic, in order to ease other treatments, when the tooth is in a position that creates obstacles or harmony with the nearby teeth. Third; prophylaxis, in order to minimize the risk of damages of upcoming teeth, however is not recommended to perform any surgical interevent in lack of clinical signs and symptoms as complications are more than benefits.<sup>4,5</sup>

### Conclusions:

Patient care outcome relies on proper assessment, evidence-based medicine diagnosis and treatment. Nowadays, reconstructive technologies are introduced and we as oral and maxillofacial physician should take advantages of such quality diagnostic images: besides advantages, in addition to the potential benefit in the reduction of complications related to the patient, also resides in the different approach of the surgeon: stress and duration of dental and oral maxillofacial surgical procedures significantly is reduced because the respective medical specialist know exactly the position of anatomical structures. This information will help the surgeon to determine a possible post-operative paresthesia and plan the better surgical technique.

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