COMPUTED TOMOGRAPHY EVALUATION IN THE TREATMENT OF TEMPROMANDIBULAR JOINT ANKYLOSIS


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ABSTRACT:
Accurate radiographs are invaluable to the correct diagnosis and treatment planning of TMJ ankylosis. In a retrospective clinical study CT scans of five patient’s of TMJ ankylosis were reviewed to establish the clinical value of computed tomography. Presence or absence of assessment criterias like Ankylosis of the joint, Unilateral or Bilateral ankylosis, Bony or Fibrous status, Anterioposterior width, Medial extension of the mass, Elongation of Coronoid process & involvement of major anatomic structures were noted and evaluated on CT scans. This data was compared with the records of intra-operative findings. With all the criteria the findings of CT were in confirmation with the patient’s intra-operative records. Thus no significant difference was found between the two findings. The present study enables us to conclude that CT images can be useful to the clinician in diagnosis and treatment planning of TMJ ankylosis. These methods enhance the accuracy of diagnostic decisions and the establishment of appropriate treatment plans.

Key Word: Tomography, Computed Tomography, Tempromandibular Joint Ankylosis.

INTRODUCTION
Ankylosis of the temporomandibular joint is characterized by restriction or limitation of mandibular movement and a limited range of motion on opening. This condition leads to functional and esthetic disability, and personality changes due to psychological involvement.

The diagnosis of TMJ ankylosis is done on the basis of its clinical presentation and its extent and severity will be confirmed with the help of various radiographs. However, its visualization is not clear in most of the cases involving conventional radiographic techniques. Orthopantomography shows temporomandibular joint ankylosis but does not give a clear picture.

The human face is three dimensional, so the clinicians must have accurate three-dimensional information about the maxillofacial region to plan their operations effectively. Computed tomography is therefore mandatory. Innovation of computed tomography in 1972 by Godfrey Hounsfield has changed the whole scenario of diagnostic radiology.

Three Dimensional-Computed Tomograph Reconstruction enables clinicians and especially surgeons to visualize and manipulate and bridge the gap between radiology and surgery.

A definite place has now been established for computed tomography scanning in the assessment and management of TMJ surgery and it is a common experience of clinicians using CT, that the diagnostic return of this investigation is often far greater than could be expected or suspected from clinical examination and standardized radiograph alone.

Due to the increasing use of the CT and its importance in the diagnosis of this disease, the aim of this study is to evaluate the surgical treatment of TMJ ankylosis on the basis of CT, by using several slices as axial, coronal, sagittal, and three-dimensional reformatted images. Also to compare discrepancies between the CT findings and surgical treatment of Tempromandibular Joint ankylosis.

MATERIALS & METHODS
In this retrospective study CT scans of five patients, irrespective of sex, who were reported and treated to the Department of Oral & Maxillofacial Surgery, K.M.Shah Dental College & Hospital, Vadodara, with the clinical evidence of Tempromandibular Joint ankylosis were included.

All the patients had been treated by newer technique Modified gap arthroplasty with Coronoidectomy introduced by K.I.Desai (1996) via modified Myrhaug’s pre auricular incision (DESAI 1996) Fig.1(a,b,c,d).
incision was given by extending the anterior part of its horizontal extension a little more forwards and slightly downwards to prevent injury to zygomatic branch of facial nerve and massetric nerves and vessels. The modification also helps to better expose the coronoid process which is invariably elongated in ankylosis. Based on radiological reports of the CT scans, presence or absence of assessment criteria like ankylosis of the joint, unilateral or bilateral ankylosis, bony or fibrous status, Anterioposterior width, medial extension of the mass, Elongation of Coronoid process & involvement of major anatomic structures were noted and evaluated. This data was compared with the records of intra-operative findings.

Figure 1a. Right side TMJ ankylosis as seen in axial view, coronal view And 3 D Ct Scan
RESULTS
The data was evaluated using Z test. As per the CT findings Ankylosis of Tempromandibular Joint was present in all the cases, and also the same findings were noted in intra-operative records.
On CT scans the pattern of unilateral ankylosis and bilateral ankylosis was found which was similarly noted in intra-operative records.
All the 5 cases were of bony ankylosis and no case of fibrous ankylosis found in CT findings and same results were found in intra-operative records thus showing no significant difference between both findings.
The anterio-posterior width, mediolateral depth and relation to the medial cranial fossa were also assessed and correlation was found between CT records and intra-operative records.
In none of the cases the elongation of the coronoid process or involvement of major anatomical structures was found on CT and results were similar to intra-operative records.

DISCUSSION
CT is now recognized by many specialties as an important new diagnostic procedure, and like any new technique its clinical role must be carefully evaluated and defined. Many papers have been published on its use in neurosurgery, ophthalmology, otolaryngology and other clinical disciplines. However, little has been written on its value in oral surgery. Langdon reviewed the development and principles of CT and outlined its clinical application in the assessment of malignant tumors of the head and neck, and Ames and associates presented their findings in five patients with benign conditions of the jaws. Desai K.I. in their study of thirty patients of maxillofacial trauma also revealed that CT provides an indispensible aid in diagnosis of maxillofacial injuries. He suggested that the technique is non-invasive, rapid and can be undertaken as an outpatient procedure. In conventional radiographs soft tissue shadow exists which obscures detail, which can be clearly seen on CT scan. Thus advent of three dimensional CT reconstructions has bridged the gap between radiology and surgery.3
The present article reviews the value of CT as an aid to diagnosis and treatment planning in conditions affecting the TMJ ankylosis and related pathologies.
Reconstruction of facial skeleton after Tempromandibular Joint pathology is fundamentally a geometric task. It requires a three dimensional restoration of osseous structures. Pre surgical images in all the three planes viz. coronal saggital and axial, identify the location and exact position of the ankylosed mass. Computerized tomographic studies specifically for the evaluation of the TMJ where first described by Suarez, Raustia et al. reported the dysfunction of the temporomandibular joint as the target of the first protocol addressing the dental use of CT.5 Several studies confirm that CT supplies relevant information for the diagnosis, therapeutic planning and surgical follow-up of patients with Tempromandibular Joint Ankylosis.5 According to the study made by Gusztav Klenk & Adam Kovacs, Computed tomography is mandatory for temporomandibular joint ankylosis. Coronal and axial 2DCT is sufficient for the diagnosis, and 3DCT is helpful in treatment planning.2 Marcia Spinelli Casanova et al in their presentation of 2 cases of TMJ ankylosis were also of the view that CT provides more information about condyle, mandibular fossa, articular eminence...
and surrounding tissues giving better evaluation of the condyle medial pole and lateral pole as well as the central region.¹ Ibrahim E El-Hakim & S A Metwalli in their study found that post-contrast coronal CT was the best imaging modality for planning surgery as it displayed the anatomical relationship between the ankylosed segment and the surrounding vital structures, particularly where the sphenoid and temporal bones were involved.⁶ Present study also supports the above findings on the basis of 10 assessment criteria. No significant difference was found between the CT findings and patient’s intra-operative records. CT scan has been demonstrated to show changes in the relationship of the condyle to the mandibular fossa more precisely than conventional radiographic examinations. It better demonstrates fine bony alterations at the fracture site together with the direction of displacement of the condyle both antero-posteriorly and mediolaterally. It is capable of demonstrating changes in the position and function of the disc using a soft tissue window. CT is particularly indicated for suspected central dislocations of the condyle through the glenoid fossa where it will also demonstrate the presence of any related intra- or extra cerebral hematoma. CT scans are readily available and affordable. Thus CT scans can be useful to the clinician in diagnosis and treatment planning of TMJ ankylosis. These methods enhance the accuracy of diagnostic decisions and the establishment of appropriate treatment plans.

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