

Editorial

Cephalometry: is it just an orthodontic record?

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Abstract:

Lateral Cephalometry (LCM) has been a mandatory diagnostic tool in orthodontics since a very long time. Nowadays with the advent of 3D imaging, the use of this two dimensional radiographic technique is questioned for its competence. However there are few aspects which are overlooked and should be heeded before obsolete the technique completely from the field of orthodontics.

Keywords: cephalometry (CM); diagnosis; measurements

*Bangladesh Journal of Medical Science Vol. 14 No. 02 April'15. Page: 313-315
DOI: <http://dx.doi.org/10.3329/bjms.v14i4.23078>*

CM is a radiographic technique that revolutionized the field of Orthodontics in 1931¹. Before its advent, there was no accurate method to measure the craniofacial dimensions of a living patient. Though the desire to know the human face structure is not new and is also reflected even in the sixteenth century sketches of Durer and Da Vinci. Then arises Anthropometry; the name given to the method for measurement of skeletal dimension in a living being, though it did not give accurate skeletal dimensions because of enveloping soft tissues. Much later craniometry was introduced which involved the measurement of dry skull with craniostat. But obviously it was also limited in use as it overlooked the soft tissue thickness variations and longitudinal studies were also impossible. Pacini was the first to attempt standardization in radiography of head in 1922 and then Broadbent in USA and Hofrath in Germany announced their methods of radiography (CM) of skull simultaneously². CM combined the advantages of anthropometry and craniometry, which made it possible to measure craniofacial hard tissues as well as soft tissues.

Lateral and postero-anterior (Frontal) are two common views of cephalometric radiographs (CMR). Postero-anterior view is used to assess and measure facial asymmetry whereas LCMR is used to evaluate craniofacial region in sagittal and vertical planes. Since most of the orthodontic patients report with the skeletal or dental discrepancies in sagittal and vertical plane, therefore LCMR became a

mandatory diagnostic tool in orthodontics. It became a regular practice to trace the LCMR of patient on acetate paper, perform the cephalometric analysis and compare the measured values with the standard values (norms) derived from cephalometric analysis of people with good dentofacial esthetics. Since the concept of esthetics and facial morphology varies significantly among societies^{3,4} an orthodontist has the challenge to give best possible esthetics to that patient acceptable to his own society. Therefore the standard norms of the respective population should be followed⁵⁻⁷.

Treatment is impossible without proper diagnosis. A doctor cannot rely on the patient's chief complaint and he has to reach to the root of the problem. For an instance a patient complaining of protruding upper incisors that makes his lips unable to meet does not necessarily has problem just with his incisors. He may have skeletal issues like shorter mandible or excessively grown maxilla. Furthermore the discrepancy can be at skeletal basal level or involving dentoalveolar part. All the mentioned problems usually lead to the common complaint of protruding incisors from patients. Therefore for appropriate treatment, diagnosis is of utmost importance and here comes the role of CM. There are hundreds of methods to analyze craniofacial structures (cephalometric analyses). Approaches may differ but the aim is to relate the position of jaws and teeth with stable reference structures or planes to diagnose the

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source of malocclusion.

Although questions have been raised nowadays against the diagnostic values of CM and it has been emphasized on treating the patients on their clinical appearance rather than cephalometric numbers. This is agreeable to an extent but the importance of the radiograph in many cases cannot be neglected. In a growing patient who needs to be treated with growth modification appliance, an orthodontist can assess the growth status through LCMR (Cervical vertebral maturation) without advising additional X-rays exposure to the patient (Hand wrist radiograph)⁸. Clinical improvement is undoubtedly appreciable with naked eyes but the treatment progress evaluation is not possible without angular and linear measurement of radiograph. Every treatment has some skeletal and dental changes so how is it possible to estimate the contributory factor in results without measurement. 3D imaging is replacing the 2D LCMR but in many

countries where 3D imaging is either very expensive or not easily available, LCMR is still used to predict the results of orthodontic⁹⁻²² and orthognathic surgery²³. Even the communication with maxillofacial surgeon to elaborate your requirement in orthognathic surgery case would become impossible without cephalometric readings.

Nasopharyngeal and oropharyngeal space measurement is also required in patients with sleep apnea and cleft palate which is easily achievable with lateral cephalogram. Phonation Ceph (exposure with the patient sounding vowels) gives very clear idea about velopharyngeal incompetence in patient with submucosal clefts²⁴.

LCMR is still a needed diagnostic aid in many typical and atypical orthodontic cases, therefore the use cannot be neglected till an easily accessible and affordable alternate is available to orthodontic community.

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