MODERN MEDICINE AND PRACTICE
https://inovatus.es/index.php/ejmmp
EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE
Vol. 5 No. 12 (Dec - 2025) EJMMP ISSN: 2795-921X

DIAGNOSIS OF CRANIOFACIAL AREAS AND THEIR PLANNING FOR TREATMENT

Tolibjon Fayzullayevich Shomuradov
Bukhara State Medical Institute named after Abu Ali ibn Sina

Annotation: This article presents the opinions of domestic and foreign scientists on the features of analysis in the diagnosis of the craniofacial region and their assessment. Keywords: diagnostic reports, Cephalometric analysis, Lower jaw, Vertical condyle growth, facial height, Posterior alveolar process of the upper jaw,Downward growth of the molars of the upper jaw.

Key words: Craniofacial diagnosis; facial asymmetry; cephalometric analysis; maxillofacial imaging; 3D CT scanning; orthodontic planning; orthognathic surgery; cranial morphology; soft tissue evaluation; dental occlusion analysis; treatment planning; digital modeling; craniofacial anomalies; skeletal deformities; functional assessment; facial proportions.

Introduction.

Diagnostic records and their analysis. It is very important to obtain high-quality, uncompromising diagnostic data for further assessment of the condition of the craniofacial region, the structure of teeth and oral cavity, occlusion or occlusion, as well as the proportions of the face and jaws.

These recordings include models for examination and occlusion recordings, photographs of the face and oral cavity, as well as X-rays. Diagnostic records document the patient's condition prior to treatment and provide additional information necessary to make an accurate diagnosis.

To assess the bite, a set of plaster models for the study should ideally display all teeth and alveolar processes. To do this, the impression must be clearly visible in the labial-buccal and lingual grooves, ensuring maximum displacement of soft tissues. In addition, to better visualize the asymmetry in the shape of the arch and the location of the teeth, the models should be trimmed with a symmetrical base. Low-quality research models do not provide adequate diagnostic information. It is important to obtain an occlusion record by recording the patient's wax bite during normal occlusion. The clinician must ensure that there is no gross discrepancy between this position and the position of the lowered flap. A sagittal discrepancy of 1-1.5 mm is of little importance; however, a larger discrepancy or lateral displacement should be carefully recorded by registering the bite in the central ratio (CR). The analysis of the research model is a three-dimensional assessment of the condition of the dentition of the upper and lower jaw, the bite and the determination of the degree of malocclusion. This should be correlated with other important diagnostic criteria such as cephalometric analysis and radiography. A certain relationship between the width of the dental arch, the length and the material of the mesiodistal tooth was expressed by various indices of Tone, Ponta, Linder, Hart and Korkhaus. In modern orthodontic diagnostics, these methods are generally considered to have minimal diagnostic value, but they are still widely used in most orthodontic practices and institutions.

Arc shape analysis

1. It is necessary to evaluate the width of the maxillary arch in the premolar and molar areas to determine whether it is narrow, normal or wide. These values depend on the total width of the four upper incisors in the mesiodistal direction (SI). The Ponta index Maxillary arch width (premolar region) SI x 100/80 arch width (mandibular region) SI x 100/64 and the Harth m Linder classification SI x 100/85 and SI x 100/64 for arch width in the premolar and molar regions, respectively, the values obtained in this way indicate the ideal width of the premolars and molars.

2. To assess the compliance of the arch perimeter from molar to molar, compliance with existing dental material, or assessment of the degree of inconsistency, the Carey analysis for the mandibular arch and the analysis of the arch perimeter for the maxillary arch are used. The length of the arc to the center from the first molars is measured using a soft brass wire, which is applied to the occlusal surfaces above the contact points and incisor edges.

3. To assess the width and length of the basal arch of the upper jaw and determine the method of treatment, removal or expansion, depending on the degree of width of the dental arch, the Ashley Hou analysis is used.

Analysis of mixed dentition.

The analysis of mixed dentition is useful for estimating the size of permanent teeth that have not erupted and calculating the available space. The information obtained helps in planning treatment in cases where intra-arc discrepancies occur (crowding, rotation, etc.), as well as in cases where correction of occlusion in the inter-arc spaces is required. Despite the numerous proposed methods, they are mainly divided into two types: Methods involving measurements based on X-ray images. Methods involving the use of forecasting tables, for example, Moyers forecasting tables and Staley–Kroeber graph. Each method has its own disadvantages and advantages. When choosing a method, it is necessary to take into account accuracy, ethnic differences and ease of use. The author believes that the following two methods are quite accurate, simple and clinically useful.

Dental X-ray measurement:

a) It is important to obtain a high-quality, undistorted periapical X-ray. The magnification on the radiograph can be determined simply by measuring the other erupted tooth and applying the following equation of proportionality: The actual radiographic width of the main molar, the width of the main molar is equal to the actual width of the non-erupted premolar, the radiographic width of the non-erupted premolar. This method can be used in both arcs and in all ethnic groups.

b) The Tanaka and Johnston method: The width of the lower incisors is used to estimate the width of the canines and premolars that have not erupted. The method has a slight tendency to overestimate the size of uncut teeth. The predicted values of Tanaka and Johnston are half the mesiodistal width of the four lower incisors + 10.5 mm, which is equal to the estimated width of the canines of the lower jaw and premolars in one quadrant. Half of the mesiodistal width of the four lower incisors is + 11.0 mm, which is equal to the estimated width of the canines of the upper jaw and premolars in one quadrant. Radiographic data and their analysis are an integral part of orthodontic diagnostics.

A clinical examination is useful to assess the proportions of the face and the ratio of the jaws., as well as the location of soft tissues in all three planes. However, accurate quantification of the size, position, and orientation of the jaws, teeth, and soft tissues is possible only with cephalometric examination. The information obtained as a result of cephalometric analysis helps to accurately identify problem areas, which is important for making an accurate diagnosis and drawing up a detailed treatment plan. In fact, these data also help predict the prognosis of the disease in many cases. A systematic approach to cephalometric analysis should include an assessment of:

- Base of the skull
- The skeleton of the upper jaw
- maxillary region • mandibular region
- The skeleton of the lower jaw
- maxillofacial ratio
- Soft tissues of the face

Assessment of the base of the skull

The growth of the base of the skull, although it seems far from the main task of an orthodontist, affects the height and depth of the upper part of the face and the position of the upper teeth during orthodontic treatment. It is important to assess the length and curve of the anterior and middle cranial pits. Since the anterior and middle cranial fossa are connected to the upper and mandibular branches, respectively, when they are of average length, the average length of the upper and mandibular branches is normal and expected. When the cranial fossa is shorter or longer, a corresponding change in the height of the upper jaw or branches can be considered normal. A greater bend in the base of the skull or a smaller saddle angle leads to an increased predisposition to a class III skeletal structure, despite the normal size of the upper and lower jaw. Similarly, a decrease in the curve of the base of the skull or an increase in the saddle angle will lead to a greater likelihood of having type II jaws, even if the jaws are of normal size. The number of parameters Means that a woman Means that a man

1. Ar-Ptm 32.8+- 1.9mm 37.1+- 2.8mm
2. Ptm-N (parallel to HP) 50.9+- 3.0mm 52.8+- 4.1mm
3. Saddle angle (N-S-Ar) 123° +-5°
4. Articular angle (S-Ar-Go) 143° +-6

Soft tissue analysis

Since orthodontic treatment affects the position of the teeth and jaws, which in turn affects the morphology of the overlying soft tissues of the face, assessment of the soft tissue components of the face plays an important role in diagnosis and treatment planning.

1. The morphology, position and size of the nose, although they cannot be directly changed by orthodontic or orthopedic intervention, have a significant impact on the overall appearance of the face. Consequently, its various parameters require careful evaluation.

2. The nasolabial angle is determined by the tip of the nose and the protrusion of the upper lip. The assessment of deviation from the normal nasolabial angle should be carried out by individually assessing each of the factors by drawing a correct horizontal line through the nasolabial cavity. The nasolabial angle helps determine the protrusion of the upper dentition and upper lip and is an important factor to consider when determining the degree of retraction of the front teeth.

List of used literature:

1. Modern concepts, goals and mechanisms of clinical orthodontics, 2015 / Ashok Karad. John J. Sheridan.
2. Modern therapy in Orthodontics, MOSBY, 2012 / Ravindra Nanda, Sunil Kapila.
3. Orthodontics. Diagnosis and treatment of maxillofacial anomalies and deformities. GEOTAR Media. 2016 / Persin.
4. Introduction to Orthodontics, OXFORD, 2013 / Laura Mitchell.