RADIOLOGICAL SPECIFICS OF TEMPOROMANDIBULAR JOINT STRUCTURE IN CASE OF DENTITION ISSUES COMPLICATED WITH DISTAL OCCLUSION

Sergey Konnov, Alexey Bizyaev, Valery Konnov, Catherine Pichugina, Svetlana Salnikova, Angelica Khodorich, Vezifa Mikailova

Department of Orthopedic Dentistry, Saratov State Medical University, Saratov, Russia
E-mail: konnovvaleriy@rambler.ru

Alexey Bizyaev

Catherine Pichugina

Dentition defects with no timely treatment can be complicated by lower jaw displaced backwards, which contributes to the development of distal occlusion, altered topography and function of the temporomandibular joint. While treating the pathology, moving the mandible to the front is accompanied with the mandible head movement in the sagittal plane within the man-dibular fossa, due to which it stands out as important knowing the radiological features of the shapes, topography, and the dimensional features of these morphological elements [1–6].

Aim. To identify (employing X-ray methods) the major types of the temporomandibular joint structure in the sagittal plane in case of disturbed dentition complicated with distal occlu-sion.

Materials and methods. The survey involved 180 patients aged 20-55, with dentition de-fects complicated with distal occlusion. Lateral tomography (universal radiological unit — Orthophos 3, by Siemens) was performed to evaluate the anatomic and topographic features of the temporomandibular joint. The zonograms measured the width of the mandibular fossa and the head of the lower jaw in the sagittal plane.

Results and discussion. The zonorams showed that the anteroposterior size of the man-dibular fossa was 14.69 ± 0.07 mm; the minimum width — 10 mm, and the maximum — 17.9 mm. The following types of its shape were identified: narrow — up to 12 mm (11.55 ± 0.17 mm); medium — from 12 to 15 mm (14.15 ± 0.05 mm), and wide — exceeding 15 mm (15.88 ± 0.07 mm). The width of the mandible head was 9.67 ± 0.10 mm, the minimum width being 7 mm, while the maximum of it was 14 mm. The shapes were identified: small — up to 8 mm (7.45 ± 0.06 mm); medium — 8 to 11 mm (9.37 ± 0.06 mm), and large — above 11 mm (11.65 ± 0.13 mm).

Depending on the ratio of the mandibular fossa width and the mandibular head in the sagittal plane in adults with dentition defects complicated with distal occlusion, three types of the temporomandibular joint structure were identified: first — a narrow mandibular fossa (up to 12 mm) with a medium-width mandible head (8–11 mm); medium mandibular fossa (12–15 mm) and a larger mandible head (more than 11 mm); second — a narrow mandibular fossa (up to 12 mm) and a small-width mandible head (up to 8 mm); the mandibular fossa and the mandibular head of medium width (12–15 and 8–11 mm, respectively); a wide mandibular fossa (over 15 mm) and a large-width mandible head (more than 11 mm); third — a medium-width mandibular fossa (12–15 mm) and a mandible small head (up to 8 mm); a wide mandibular fossa (more than 15 mm) and a medium-width mandible (8–11 mm); a wide mandibular fossa (more than 15 mm) and a small-width mandible head (up to 8 mm).

Conclusion. In view of the zonographic data above, depending on the ratio of the mandibular fossa width and the mandible head in the sagittal plane in adults with dentition defects complicated with distal occlusion, there were three temporomandibular joint structures identified: first — the mandible head shape exceeding the respective shape of the mandibular fossa; second — the mandible head shape corresponds to the mandibular fossa shape; third — the shape of the mandible head smaller than the corresponding mandibular fossa shape.

REFERENCES

1. **Davydov B.N., Vedeshina E.G., Dmitrienko S.V., Domenyuk D.A.** Radiological and morphometric methods for comprehensive assessment of cephalo-odontologic status in dental patients (Part I). The Dental Institute. 2017; 75(2):58–61. (In Russ.).
2. **Davydov B.N., Vedeshina E.G., Dmitrienko S.V., Domenyuk D.A.** Radiological and morphometric methods for comprehensive assessment of cephalo-odontologic status in dental patients (Part II). The Dental Institute. 2017; 76(3): 32–35. (In Russ.).
3. **Konnov V.V., Davydov B.N., Vedeshina E.G., Domenyuk D.A.** The morphology of the temporomandibular joint in normal occlusion and distal occlusion complicated by defects of dentitions (Part I). The Dental Institute. 2017; 74(1):92–94. (In Russ.).
4. **Konnov V.V., Davydov B.N., Vedeshina E.G., Domenyuk D.A.** The morphology of the temporomandibular joint in normal occlusion and distal occlusion complicated by defects of dentitions (Part II). The Dental Institute. 2017; 75(2): 66–69. (In Russ.).
5. **Korobkeev, A.A.** Changes in the structural elements of the temporomandibular joint with distal occlusion / A.A. Korobkeev, D.A. Domenyuk, E.G. Vedeshina, V.V. Konnov, O.Yu. Lezhnina, Ya.A. Korobkeeva // Medical news of North Caucasus. 2017. – Vol. 12. – № 1. – P. 72–76. (In Russ., English abstract). DOI: 10.14300/mnnc.2017.12020.
6. **Shkarin V.V., Domenyuk D.A., Porfiriadis M.P., Dmitrienko D.S., Dmitrienko S.V.** Mathematical and graphics simulation for individual shape of maxillary dental arch // Archiv Euro-Medica, 2017. – Vol. 7. – № 1. – P. 60–65.

SPECIFICS OF OCCLUSION DISTURBANCES IN ADULTS WITH DISTAL OCCLUSION DUE TO DENTITION DEFECTS

Sergey Konnov, Anoush Arushanyan, Valery Konnov, Damir Razakov, Rustam Mukhamedov, Catherine Pichugina, Vezifa Mikailova

Department of Orthopedic Dentistry,
Saratov State Medical University, Saratov, Russia
E-mail: konnovvaleriy@rambler.ru

Anoush Arushanyan

Catherine Pichugina

Occlusion factors at distal occlusion caused by dentition defects play a leading role in the development of the temporomandibular joint pathology, which is due to its close connection with the neuromuscular apparatus of the dentition system as well as the nature of the occlusal contact [1–6]. In this regard, knowing the specific features of occlusion disorders in adult patients with distal occlusion due to dentition defects appears to be quite a relevant issue.

Aim. To identify specific features of occlusion disorders and their dynamics through treatment in adult patients with distal occlusion caused by dentition issues.

Material and methods. A survey was performed involving 47 patients (age 20–50) who were undergoing orthopedic treatment for distal occlusion due to dentition defects. The occlusion examination was carried out in the oral cavity and on the diagnostic jaw models using the Bio-Art Equipamentos Odontologicos Ltda articulator, which followed by their analysis and calculation of the occlusiogram index (OKG) by N.H. Khamitova.

Results and discussion. The occlusion analysis showed that 91.8% of the patients had premature occlusal contacts, including 42.6% in the conventional occlusion; 63.9% — in the anterior occlusion, 34.4% — on the laterotrusive side; 19.7% — on the mediotrusive side. At laterotrusive movement of the lower jaw, only 11.5% of the cases were identified to have group contact of the teeth on the working side; the canine contract was identified in 14.7%, while another 8.2% of the patients had mixed contact of the teeth. 65.6% of the patients revealed pathological occlusion at laterotrusive movement of the lower jaw. The occlusiogram index was 38.50 ± 3.50 conventional units. Moving the lower jaw to the front was carried out with functional-guiding orthodontic devices. The outcome of restoring the occlusal disorders was the normalized