

## **Correlation of the clinical and diagnostic evaluation of osteoarthritis and arthritis of the temporomandibular joint using computed tomography**

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**Abstract:** Osteoarthritis and arthritis are frequent pathologies of the temporomandibular joint - TMJ, accompanied by joint dysfunction. Often shown similar clinical symptoms of varying severity. At the same time, the differentiation of the morphological essence of pathological changes in the joint is an important condition for adequate treatment. According to Kerry Read, all types of arthritis are divided into 2 categories: degenerative (osteoarthritis) which progress gradually and occur more in the adult contingent, inflammatory ones that progress rapidly and can occur at any age are in different types of rheumatoid, inflammatory, psoriatic, infectious, gouty, etc. The present study was conducted to study the radiological changes in the TMJ in patients with osteoarthritis and arthritis of this joint with the determination of the presence of any correlation between them and clinical data.

**Key words:** temporomandibular joint, osteoarthritis, arthritis.

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## **INTRODUCTION**

Arthritis means any inflammatory condition of the joint, is a destructive process presence in the bony surfaces of the condyle and the fossa. It is usually considered that the body's response is to increase the load of the joint.

The discrepancy that occurs between the results obtained during visualization and the patient's symptoms emphasizes the need for an effective clinical examination in determining which result is significant (Brooks SL, Brand JW, Gibbs SJ).

Arthritis is an inflammation of synovial membranes that extends to surrounding connective tissues and articular surfaces. If the joint tissues damage, several bone changes can occur. This can cause painful symptoms of the joint and surrounding structures and cause destruction of the temporomandibular joint surfaces if they are not evaluated and treated on time. Early intervention can reduce the severity of the disease. High spatial resolution of the CT of the temporomandibular joint allows a good assessment of bone changes. The present study was conducted to determine the morphological basis of clinical manifestations of osteoarthritis and arthritis of the TMJ on the basis of comparison of clinical and computer tomographic signs of the disease.

The aim of the study was to determine the clinical and radiological criteria for osteoarthritis and arthritis of the TMJ based on the comparison of CT and clinical manifestations of the disease.

## **MATERIAL AND METHODS**

74 patients were examined, 18 of them had arthritis as a result of a complex clinical laboratory and radiological examination, and 56 had osteoarthritis. According to

clinical severity, patients were classified according to the modified Okeson criterion. Computed tomography in all patients is performed in multispiral mode with subsequent MPR.

Pain estimates were recorded according to their severity from 0 to III from absence to severe pain, respectively.

A detailed examination of the TMJ was carried out, which included pain, joint stiffness, clicking, and crepitus. All the mucus muscles were sensed for stiffness, and positive results were noted.

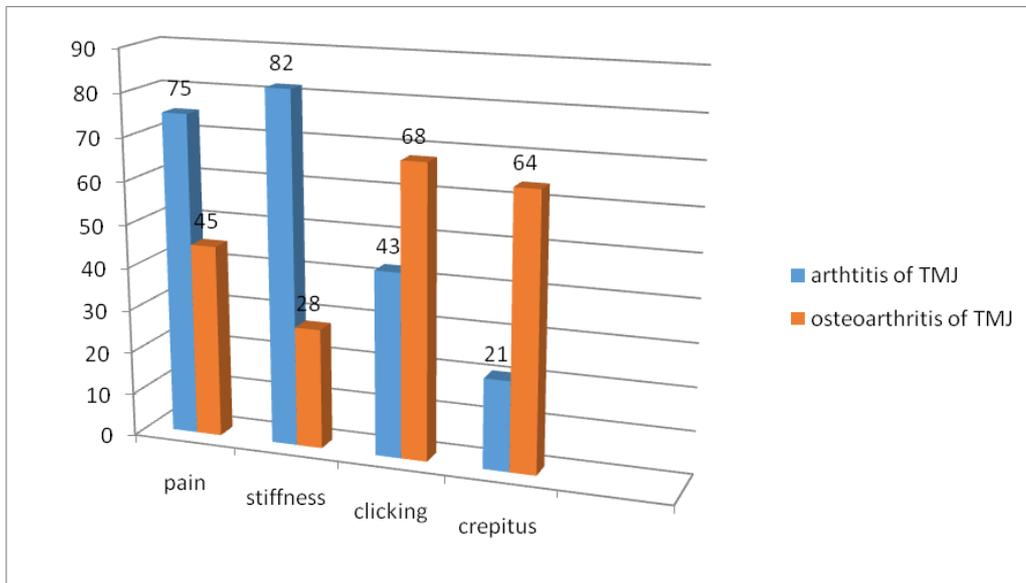
For all 74 patients, CT of the temporomandibular joints was obtained. Scanning of CT was performed in straight axial planes with a continuous cut thickness of 1 mm using a bone window of multispiral computed tomography of the TMJ was performed on a 6 cuttings (SIEMENS SOMATOM EMOTION, 125 kV, 500 mA), thin sections (thickness from 1 to 2.5 mm) obtaining reconstructive coronal-oblique sections (parallel to the axis of the condyles of the lower jaw), sagittal-oblique sections in the bone and soft-tissue windows. Also used 3 D reconstruction. In each condyle and glenoid fossa were evaluated erosion, flattening of the head, sclerosis, the formation of osteophytes, and the formation of a subchondral cyst. Changes in the joint space were also recorded.

After that, the clinical data were compared with the CT scan results for each joint and subjected to statistical evaluation.

## **RESULTS AND DISCUSSION**

**Graph-1.** Distribution of clinical symptoms of joints (right, left) in patients with arthritis and osteoarthritis of the TMJ with % indication

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The average age of patients with osteoarthritis was 65 years. The average age of patients with arthritis was 50 years. Troller P.A. concluded that osteoarthritis of the mandibular condyle occurs after 42 years. In the radiographic study of the TMJ in young patients, Wiberg B. showed that osteoarthritis appears as a result of TMJ pathology and is not related to age. In our study, it is assumed that osteoarthritis of the TMJ is associated with age and not with the TMJ pathology.

Ratio of a woman: a man in this study with osteoarthritis 3: 1, with arthritis 2: 1. The results say that women are more likely to these diseases than men.

In patients with osteoarthritis, the pain was mild: 8 joints-20%, moderate 10 joints-25%, severe 22 joints 55%.

In patients with arthritis, the pain was mild: 3 joints-14.3%, moderate 6-28.5%, severe 3 joints-50%. The nature of the intensity of pain was determined subjectively by complaints of patients.

Computed tomography was evaluated in patients with osteoarthritis and arthritis for erosion, sclerosis, flattening,

osteophyte formation, formation of a subchondral cyst, and narrowing of the joint space. In the present study, in patients with osteoarthritis, the most common symptom was the flattening of the apex of the condylar process (50%), similar to the results obtained by Gynther G. and Tronje G., a flattening in 45% of cases, subchondral sclerosis in 35% of cases and osteophytes in 55%, erosion of 93% of cases. In our study, 16% subchondral sclerosis, 19.4% osteophytes, 13.6% erosion, which had significant discrepancies with Gynther G data. and Tronje G.



**Pic-1.** CT of patient A., 61 years old. (Coronary section). The pronounced erosive-destructive changes as well as the deformation of the surface of the head of the condyle and the joint fossa of the lower jaw from both sides are more pronounced on the right.

Erosive lesions may indicate an acute early reaction, whereas flattening and formation of osteophytes may indicate late changes in the TMJ. Sclerosis and flattening reflect the stage of bone remodeling. Troller in its study identified erosion in 93.3%, the formation of an osteophyte in 21%. The formation of osteophytes is closer to the number of our data (19.4%).

In our study, in patients with osteoarthritis, the articular surface of the condyle was mainly affected including the anterior, anterior and medial lateral articular surfaces. Osteophytes were found mainly in the medial parts of the articular surfaces. In patients with arthritis of the TMJ, the upper ones were more affected: upper-medial, upper-lateral parts of articular surfaces. Erosion of the condyle was more common in the anterior parts following in the upper and posterior parts of the articular surface. In patients with osteoarthritis and arthritis of the TMJ, the condyles of the articular processes were mostly affected, while the surface of the articular fossa was more affected by arthritis of the TMJ.

On CT examination with osteoarthritis of the TMJ, flattening of the joint was half the time, with arthritis in one quarter. The most common symptom in arthritis of the TMJ was the erosion of articular surfaces in 86%, whereas in osteoarthritis in 13.6% of cases. The rarest symptom in arthritis of the TMJ was sclerosis of the articular surfaces, only in one joint out

of 28, with osteoarthritis symptom was found in 14 joints out of 88. Osteophytes was also observed more in patients with osteoarthritis in 19% than in patients with arthritis of the TMJ-7.1 %.

With osteoarthritis and arthritis of the TMJ, a large number of patients treated with complaints at a severe stage of the disease 16 patients out of 28 with arthritis, 40 patients out of 88 with osteoarthritis of the TMJ.

When comparing the clinical signs and results of MSCT to mild arthritis, joint stiffness and erosion of articular surfaces were the most common sign, whereas in the case of osteoarthritis of the TMJ, crepitation, clicking and flattening of the joint head prevailed at this stage, respectively, and there was no erosion of the articular surfaces at this stage. In a moderate degree of TMJ arthritis, in addition to stiffness, pain in the joint also predominated, according to MSCT data, erosions were also often seen with mild but more pronounced effects. In the case of osteoarthritis of the TMJ in a moderate stage, crepitation and clicking were also frequent pathologies from clinical data, except for the flattening of the head, the narrowing of the joint gap also prevailed. Of all the clinical signs of TMJ arthritis, pain was the most frequent complaint of patients and it occurred in 57.1% of cases in the severe stage. With osteoarthritis of the TMJ, clicking and crepitus prevailed at all stages of the disease but were more severe in the severe stage.

All radiological signs of the TMJ were detected in arthritis and in the case of osteoarthritis of the TMJ, but in arthritis erosion prevailed more as in all stages, in osteoarthritis, sclerosis of the articular surfaces was more prevalent.

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## CONCLUSION

Comprehensive clinical and radiological assessment, taking into account the degree of clinical severity and

computer tomography signs, improves the differentiation of arthritis and osteoarthritis of the TMJ.

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