

## Introduction:

Along with clinical examination magnetic resonance imaging (MRI) has become a standard tool in temporomandibular joint disorder diagnosis. Even though MRI diagnosis usually focuses on pathologies of the joint directly, pathological alterations of the muscles can be found as well (Fig. 1 and 2). **Objectives: Is there evidence for correlations between MRI muscle findings and clinical symptoms of TMD?**

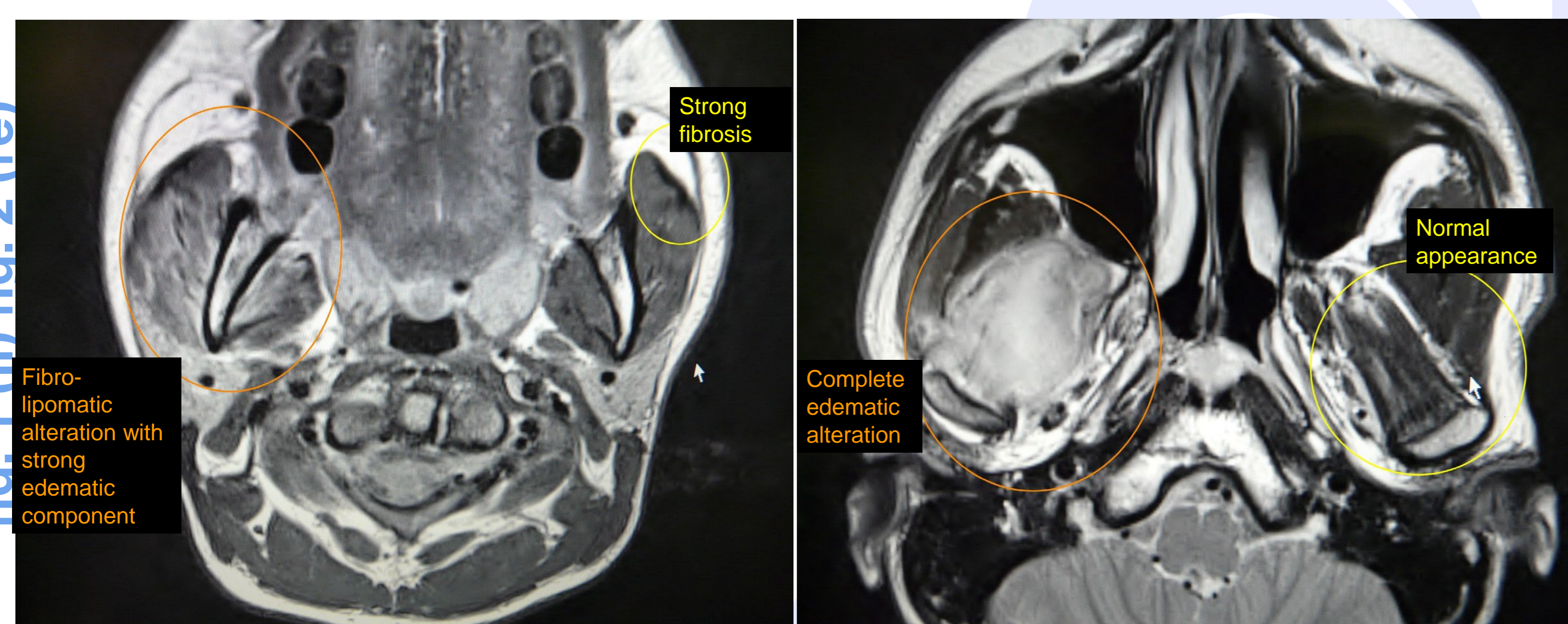


Fig. 1 and fig. 2: Examples of strong alterations of masticatory muscles in axial MR-images of patients with TMD

## Material and Methods:

Digital MR-images of 65 patients treated for TMD at the dental clinic of Goethe University Frankfurt, Germany between 2004-2012 were evaluated. One patient showing noticeable alterations in MR muscle appearance between the right and left muscles was defined as the reference for the muscle alterations of interest (Fig. 3). **Fibrous (F), lipomatic (L) and edematic (Ö)** alterations were recorded, and the widths of the **masseter, medial and lateral pterygoid muscles** were measured in the axial plane. Those findings were then matched with clinical findings of palpation, limitation or hypermobility in jaw opening, clicking, deviation and deflexion.

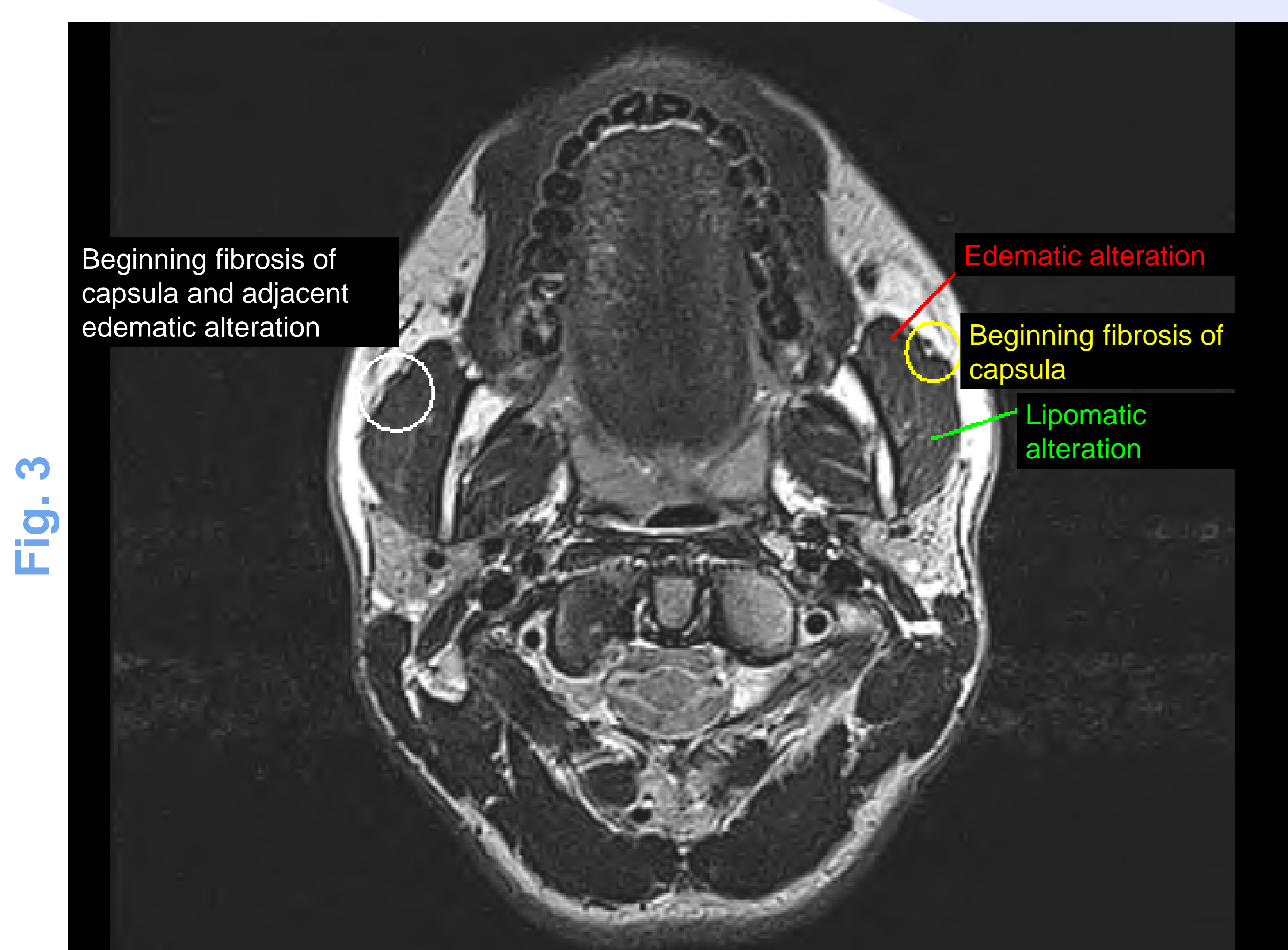


Fig. 3: Reference image for muscle alterations

## Results:

Just like in the clinical examinations, most alterations in MR signalling were found in the masseter muscle (Fig 4). 93% showed at least one of the alterations of interest, while 46% of the masseters were painful on palpation. Still, statistically this was not significant ( $p > 0,05$ ). With 17% alterations in MR signalling and 13% of clinical symptoms, findings in the medial pterygoid muscle were less frequent. Here as well, there was no proof of correlation between MR and clinical findings ( $p > 0,05$ ). Most of the MR-findings in the lateral pterygoid muscles (42%) were of a lipomatic nature. They were correlated with clinical findings of clicking, limitation or hypermobility in jaw opening and deviation or deflexion, but no statistically significant correlations were found ( $p > 0.05$ ).

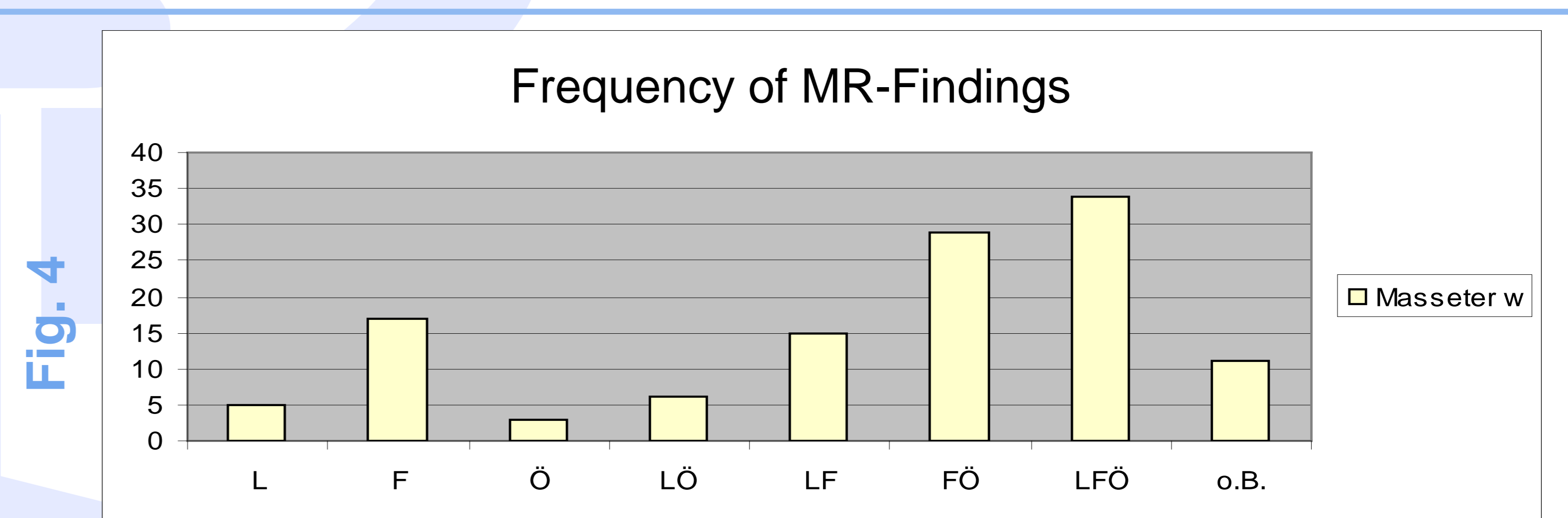


Fig. 4: Frequency of occurrence of muscle alterations - here: masseter muscle in women

Fig. 5 exemplarily shows the missing correlation between MR-findings and clinical symptoms. The following differentiations in muscle pain have been made: FAL 0 = no pain, FAL 1 = discomfort, FAL 2 = pain. Here, for example, out of 24 lipofibroedematic (LFÖ) muscles, 13 were painful on palpation while 11 showed no sign of pain.

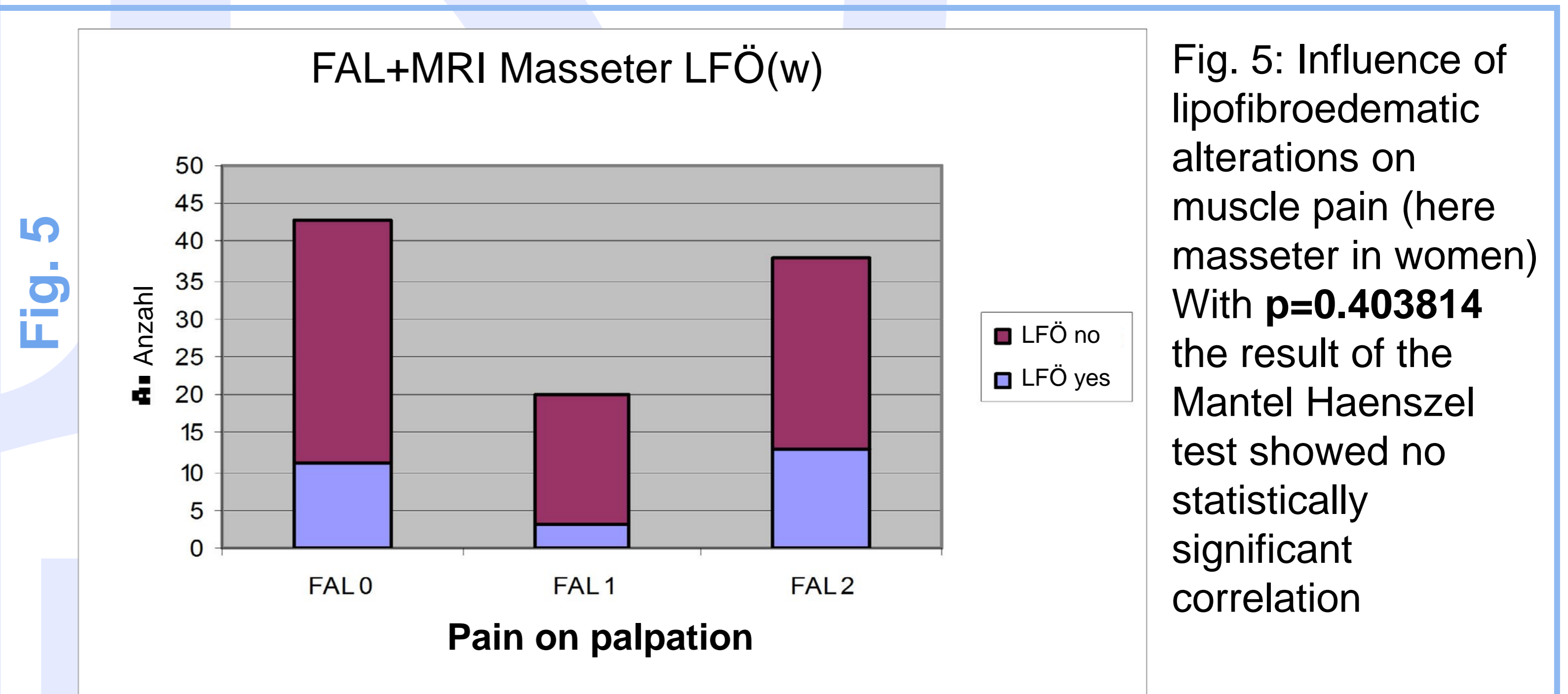


Fig. 5: Influence of lipofibroedematic alterations on muscle pain (here masseter in women) With  $p=0.403814$  the result of the Mantel Haenszel test showed no statistically significant correlation

## Conclusion:

Although MR findings of muscle alterations such as fibrosis, liposis or edema can be detected quite frequently in patients with TMD, there is no evidence of correlations between MR signaling and clinical symptoms. Therefore a thoroughly performed clinical examination is inevitable.

Since no differentiation has been made between severities of muscle alterations, further investigation is needed to determine if the severeness of signal alterations correlates with clinical symptoms.

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