

Morphological and protein expression aspects of masseter muscle fibers and extracellular matrix in malocclusion disease.

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Unilateral posterior crossbite is an asymmetric malocclusion characterized by an inverse relationship of the upper and lower buccal dental cusps on one side only of the dental arch. Patients with unilateral posterior crossbite exhibit altered coordination of the masseter muscles during mastication. Changes in masticatory musculature structure and function may be either developmental or adaptive (1) and they depend on the remodeling processes of muscle fibers and connective tissue (2).

The aim here was to investigate morphological and protein expression aspects of masseter muscle fibers and of extracellular matrix in malocclusion disease. Three patients, affected by unilateral posterior crossbite, were recruited to participate in this study; biopsies of masseter muscle have been withdrawn from left and right sides for each patient. We performed histological colorations and immunofluorescence reaction using antibody against Myf-5, MyoD, fibronectin, collagen I, III, IV and laminin.

Results of crossbite side have shown altered fibers morphology, consistent increase of extracellular matrix and its proteins; a lower number of Myf-5 and MyoD positive cells than contralateral side has been observed. In contralateral side we observed normal muscle fibers and extracellular matrix morphology, a lower expression of extracellular matrix proteins and an higher number of Myf-5 and MyoD positive cells than crossbite side.

These findings suggest us that in contralateral side, the high workload determines an hypertrophic response of muscle fibers, evidenced by the high number of Myf-5 and MyoD positive cells and probably an increased turnover of extracellular matrix which is poorly represented; the crossbite side muscle, instead, seems to show alterations of the remodeling processes as evidenced by the reduction of fibers dimension in favor of an increase of the extracellular matrix components. That could be relevant in understanding and healing of malocclusion disorders.

References

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Keywords

Masseter; crossbite; extracellular matrix; myoblast.