

EFFECTS OF THE CROSS BITE MALOCCLUSION ON THE EXPRESSION OF THE MAJOR INTEGRINS IN THE HUMAN MASSETER MUSCLE

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Introduction: Mastication is one of the most complex and co-ordinated functional movements involving diverse and accurate mandibular patterns to incise and grind food suitable for swallowing. The pattern of mandibular movement during chewing is influenced by factors such as the bolus type and the type of occlusion. The crossbite malocclusion is important for the occlusal stability, which is related to muscular performance. The masseter muscle shows a very high ATP-ase activity for contracting very quickly and forcefully participating in a wide variety of functional activities of the stomathognathic system including mastication, swallowing and speech.

Materials and Methods: Five subjects 3 men and 2 women, age 31.3 ± 5.5 years with unilateral posterior crossbite and severe skeletal class III were selected.

Biopsies of the patients were obtained under general anaesthesia from the superficial and anterior portion of both masseter undergoing orthognathic surgery. By immunohistochemical analysis, we studied the expression of the major integrin specific in the muscular tissue: $\alpha 7B$, $\beta 1D$, $\alpha 7A$ and $\beta 1A$. By specific software, we analyzed pixel intensity of 100 fibers for each reaction and a mean and standard deviation for single fibers were obtained. The following primary antibodies were used: anti- $\alpha 7B$ integrin diluted 1:50, anti- $\beta 1D$ inte- 114 grin diluted 1:50, anti- $\alpha 7A$ integrin diluted 1:100, and anti- $\beta 1A$ integrin diluted 1:50.

Results: Our results showed that the expression of integrins was significantly lower in the crossbite side muscle. In particular, these reactions showed an increased staining pattern for $\alpha 7A$ and $\beta 1A$ integrin compared to the $\alpha 7B$ and $\beta 1D$ isoforms, respect to the side with normal occlusion. Compared to isoforms of controlateral muscle fibers (side with normal occlusion), $\alpha 7A$, $\alpha 7B$ and $\beta 1A$ isoforms of masseter fibers crossbite were markedly decreased whereas $\beta 1D$ integrin, in crossbite, showed a significant decrease of distribution compared with muscle fibers $\beta 1D$ integrin, in left side.

Conclusions: Thus, our data provide the first suggestion that integrins in masseter muscle play a key role regulating the functional activity of muscle and allowing the optimization of contractile forces. In our opinion, integrins could play an important role during malocclusion diseases in masticatory muscle and in particular in masseter, in which all networks of proteins could be modified.