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Botox Treatment for Masseter Muscle Hypertrophy Results in a Compensatory Rise in Stiffness in Other Masticatory Apparatus Muscles

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Introduction

Masseter muscle hypertrophy's nature and features are poorly understood. It is characterised by an increase in muscle tissue volume, which alters the shape of the face and can affect one or both sides of the face. Considering that this disease affects the masseteric and temporalis muscles as well as the medial pterygoid, masseter muscle hypertrophy is frequently characterised in the literature as a concurrent condition to the enlargement of other masticatory muscles. Due to asymmetry in the face, patients with unilateral masseter muscle hypertrophy frequently see an aesthetic surgeon. Although more frequent, preserving the symmetry of the face is less of an aesthetic concern due to the bilateral expansion of the masseter muscles.

Description

It is more frequently linked to other symptoms including mental stress, bruxism, temporomandibular disorders, malocclusion, discomfort, otalgia, nightly trismus and oral parafunctions such unilateral chewing and excessive chewing gum. A thickened cortex of the angle and ramus of the mandible, temporal fossa and zygomatic arch with a corresponding decrease in marrow area, as well as prominent exostoses at the angle of the mandible, visible in the CT scans, are examples of changes in the adjacent bone tissue that may happen along with the increased muscle mass [1].

In individuals with masseter muscle hypertrophy, the underlying cause is frequently idiopathic. Some researchers distinguish between congenital and acquired occurrences of this syndrome, while others see all cases as congenital with a varying presentation. Less often occurring and perhaps linked to other disorders is unilateral masseter muscle hypertrophy. Although the exact cause of acquired masseter muscle hypertrophy is unknown, it is known that a number of factors, including bruxism, oral parafunctions and malocclusions, can contribute to its development. However, it is unclear whether these factors are causal or merely a by-product of the development of acquired masseter muscle hypertrophy [2]. Previous studies have demonstrated that chewing gum often can make the masseter muscle stiffer and cause bilateral masseter hypertrophy. The majority of patients say that the illness progresses gradually.

There is a lack of epidemiology information on masseter muscle hypertrophy. According to a survey of 108 instances by Rispoli afflicted patients were typically 30 years old, 57% were men, 60% had bilateral pathology and 5% also had concomitant temporalis muscle hypertrophy. Children seldom develop masseter muscle hypertrophy. Asians are thought to have masseter muscle hypertrophy more frequently and are also more conscious of the contours of their lower face [3].

Dental professionals are becoming more interested in assessing the stiffness of the masticatory muscles using SWE. A probe used in elastography creates mechanical vibrations that cause low-frequency shear waves to propagate into tissues and produce two powerful plane shear waves. Soft tissues are distorted by these shear waves to an extent commensurate with their stiffness. An ultrafast scanner then detects and registers them. This approach enables measuring the true elastic modulus of soft tissues in the defined region of interest since inversion algorithms can quantitatively map the stiffness of the tissues from this propagation picture (ROI). SWE may measure tissue stiffness quantitatively in kPa. The stiffness of the masseter muscle currently has recognised typical levels.

The rigidity of the masseter muscle in pathological circumstances is still under investigation in this work. In the current study, we looked at how much the masseter muscle stiffness decreased in persons with benign bilateral masseter hypertrophy following a single intra-masseteric Botox injection session. Additionally, we wanted to find out if a decrease in masseter stiffness would be equally distributed on both sides [4].

Since 1994, masseter muscular hypertrophy has been treated with Botox injections into the muscle tissue. According to a 2013 systematic review on the use of Botox for bilateral benign masseter hypertrophy by Fedorowicz there is currently insufficient information to make a conclusive decision regarding the efficacy and safety of intra-masseteric Botox injections. Recent papers validate developments in this sector and propose a customised method that boosts efficacy and lowers the risk of complications. The range of the effective dosage for a decrease in the masseter muscle was 48 to 72 units. They discovered that steady diminution was shown up to 12 weeks and that reinjection should be taken into consideration for maintaining a good aesthetic result after that time [5].

Conclusion

It is important to view the study as preliminary. To thoroughly assess the efficacy of the suggested therapy and changes in the muscular stiffness, more study on bigger patient populations and with longer follow-up is required.

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