

## Pearls in Dermatology

### How I treat a square face with botulinum toxin A

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Injection of botulinum toxin A as a new form of treatment for square face in Oriental patients has created a lot of interest recently. In the past, treatment of square face involved major surgery in the form of mandibulectomy and muscle resection. Operation risk and morbidity are considerable and recurrence rate is high. Injection method is simple and safe. After a loading dose of the toxin, cosmetic result is almost immediate. Further injection at intervals is needed to maintain the result. Long lasting result is possible through subsequent bony remodelling.

**Keywords:** Botulinum toxin A, square face

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#### Introduction

What is an attractive human face? As far as facial shape is concerned, most would agree that an oval face is more attractive than a square face. The height and width golden anatomical ratio of 1.618 to 1 is a famous reference. Facial shape is ethnic specific. While westerners tend to have long, narrow, oval facial contour; Asians tend to have short and wider face. Prominent mandibular angle and masseter muscle hypertrophy give an external look of square face with wide lower face. This appearance is common among Koreans and Chinese. In the past, mandibular osteotomy and myomectomy were the only treatment option. However, side effects and operation risks include swelling, infection, asymmetry, over and under

treatment, nerve injury and temporo-mandibular joint morbidity. Despite operation, recurrence is common.

Recently, the use of botulinum toxin A (Botox, Allergan, California) injection to the masseter muscle has produced a more cosmetically approved facial contour. Studies have showed that the treatment is simple, safe and effective. According to Moss and Enlow, the action of muscle attaching to a bone determines the volume and density of that bone. As we can observe in orthopaedic patients, bone atrophy occurs during disuse and re-growth with muscle use in rehabilitation. Botox achieves muscle shrinkage. Cosmetic effect can be observed in a month's time. Maintenance of muscle atrophy in a reasonable time frame can cause bone remodelling thus reducing the need for osteotomy.

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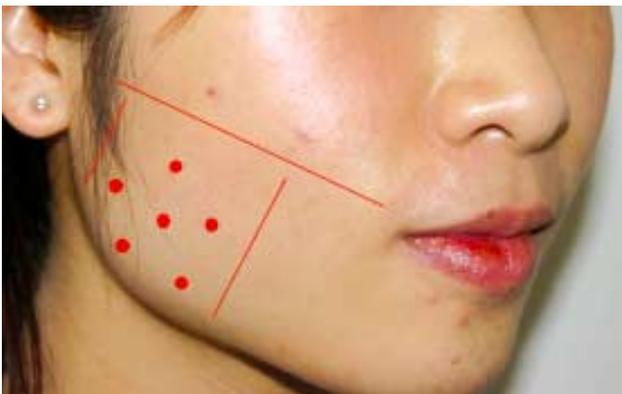
#### Pre-treatment assessment

Mandibular hypertrophy is not a pathological diagnosis. It is a subjective perception on the part

of the patients as to how much they think their jaw is excessive. The doctor has to be sure, however that normal bone and muscle hypertrophy is the cause of the squareness of the jaw and not some other pathological facial mass such as bone tumour and parotid condition. I have observed that more than half of my clients requesting treatment of their square face give a history of habits like gum chewing, bruxism and teeth clenching. These problems should be tackled accordingly.

## Method

Mark the anatomical point for injection. Draw a line (T line) extending from the tragus to the angle of the mouth. Also mark the anterior and posterior border of the masseter. A bottle of Botox which contains 100 units of botulinum toxin A is freshly prepared with a 2.5 ml diluent. Each side will be injected with 28 units through five to six injection points. The first hit is right into the prominence of the muscle and the rest of the drug would be injected around this point spaced uniformly apart (Figure 1). Avoid hitting above the T line as you can easily inject into the deeper pterygoid muscles. The best reference for beginner in fact is to find the



**Figure 1.** Inject below the line drawn from the tragus of the ear to the angle of the mouth and behind the anterior border of the masseter muscle.

mandible. All you can do is to hit deep until you find the mandible and then withdraw.

To avoid complication, don't attempt to treat in one go by a single high dose injection. On average, a cumulative dose of 60 units on each side is needed to achieve satisfactory result. Starting with a lower dose say 28 units on each side, injection is done monthly until the total accumulated dose is achieved or a satisfactory result obtained. For an average case, two injections of 28 units given monthly over two months are good enough for satisfactory result.

After the loading dose, the patient will enjoy a period of good result lasting about six to 12 months (Figures 2 & 3). Then patient is advised to come back for additional injection to keep the muscle in an atrophic condition and hopefully bone remodelling and more lasting effect.



**Figure 2.** Before Botox injection.



**Figure 3.** After Botox injection.

## Adverse effects

Local swelling, pain and sense of weakness while chewing may occur and last for a few days. Dysphagia and difficulty in swallowing may occur if the drug is misinjected into the pterygoids. Therefore, always inject below the T line and try to find the mandible and pull back. Diffusion of the drug into zygomaticus and buccinator may affect facial expression; therefore, keep the injection from the anterior border of the masseter to avoid misplacing and migration of the drug to the buccinators.

## Conclusion

Botulinum toxin A injection for treating square face is a simple, safe procedure and the effect is almost immediate. The cosmetic result can be maintained

with repeated injections at intervals. Further studies will follow to confirm full clinical benefits and lasting clinical effect through bony remodelling.

## Further Reading

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