

Consideration of Thread Lifting in the Perspective of Clinical Anatomy

SAMSKIN Plastic Surgery

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When considering the necessary anatomical considerations for the safe procedure, it is important to know the characteristics of Asian skins. When comparing the anatomical differences between the facial skin and soft tissue of Westerners and Asians, skin of Asian is thicker, firmer, and heavier than Western people. Therefore, as signs of aging, the wrinkles are less common than drooping in Asians. Also, since the volume of the skin per unit area is larger in Asian, it is necessary to use a larger force than that of the Westerner in order to volumize the entire face or lift the skin and tissues.

Superficial and deep retinacular cutis of Asians, formed by retaining ligaments in the shape of branches vertically above and below the SMAS layer, to connect the surface skin and the deep layer near the underneath bone, is denser than that of Westerners. Therefore, Asians have more perforating vessels that run vertically, while the Westerners have more collateral circulation as vessels supplied to skin, which increase risks of blood vessel adverse effects due to hemorrhage in Asian patients. To avoid this, it is more important to identify the anatomically safe site and targeted layer.

If you damage a main vein or an artery, the bleed may not be controlled, making the procedure difficult to be performed and causing severe bruising with swelling. Usually, in the lower part of the face, one should be careful only in certain areas where the blood vessels are superficial. On the other hand, in the upper face or temporal regions where the thread is fixed, major blood vessels are often get injured. If the patient has a sharp and severe pain, rather causing damage to the tissues by forcibly advancing the needle or cannula, it is safe to pull the equipment little back, position it in a safer place, search the new running direction or the depth of the treatment layer and proceed again.

According to Dr. Bryan Mendelson's theory, our face can be divided into a relatively fixed lateral face and a mobile anterior face, which is involved in facial expression, according to the virtual vertical line created by the five retaining ligaments. After the facial nerve emerged from the parotid gland, it was placed safely in the deep layer below the deep fascia, which was deeper than the SMAS in the lateral face, and then move below the SMAS layer passing through the boundary with the anterior face that have no deep fascia layer. Then, it runs under the SMAS and reaches the mimetic muscles. This transition point that the deep layer converts to superficial layers was the most vulnerable region to damage facial nerve.

Dr. Rohrich described the transition point mainly focusing on the border of the fat layer. In the lateral fat compartment of the surface, the facial nerve is placed deeply under the parotid gland and parotid-masseteric fascia, and then runs onto the SMAS level at the boundary with the fat compartment of the medial side. The boundary between the two fat layers is an important transition point.

In general, it is very unlikely that the facial nerve will be injured when using the cannula for barbed thread lifting procedure. However, when using the needle, especially in the patient with thin skin and fat layer, the risks of injuring the parotid gland and duct is increased. Therefore, it is assumed that more careful operation is needed at the boundary between the lateral face and the anterior face. Especially, the shape of the monofilament threads for volume restoration is currently made to be bulky in the various forms of spring type, brush type, twisted fabric type, cylindrical mesh type and braided type and the collagen is regenerated along the space occupied by the thread. Some of these volume restorative threads tend to occupy much of the surrounding space when inserted into perioral region or nasolabial folds, which may inadvertently cause the symptoms of the surrounding sensory nerve or facial nerve.

The authors used to prefer U-shaped barbed threads that are inserted on the temporal side and pulled out at the both side on cheeks, which had significant lifting effect by pulling the tissue in one direction. However, it had disadvantage of making malar cheek to be widened and the movement of nose and mouth unnatural and uncomfortable, causing pain and discomforts when contracting the temporal muscles such as chewing food or shutting the mouth.

To overcome these defects, some clinicians have suggested using U-shaped barbed threads on the fixed lateral portion of the face, which is commonly referred to as the unmoving part of the face and I-shaped barbed threads on the mobile anterior portion.

With great deal of current improvements in the quality of the I-shaped barbed thread, even when performing lateral face lifting, without need of threading a deep temporal fascia in the temporal region of the head, worry about damage to the superficial temporal artery and vein, pain or headache, which may occur when the temporal muscle under the fascia is penetrated, an I-shaped barbed thread that can be easily manipulated by pulling the tissue through the entry points around the hairline are commonly used.

Recently, minimally invasive procedures such as filler, toxin, thread, facial contour injection, laser, high frequency, and ultrasonic devices have been applied to various layers with varying depth depending on the anatomical characteristics and requirements of each site of the face. Likewise, it is necessary to determine the layer under the skin to insert the threads considering the layer of each face made by the SMAS and retaining ligaments to obtain safer and more effective results.

In the past, when performing thread lifting procedures, the subcutaneous tissue layer beneath the skin was naturally targeted to lift the skin to which the thread is inserted. However, as

mentioned above, these concepts are changing a lot as thick barbed threads have become available. Since the lateral face is not a part of facial expression, insertion of barbed threads into deeper layer can lift more firm tissue without interfering with facial expression. Instead of simply pulling the subcutaneous fat layer, the thick barbed thread is inserted into the periphery of the SMAS layer, pulling the drooped lateral facial tissues while avoiding dimpling or irregularity of the skin.

Even our barbed thread lifting study using Cadaver, no matter how much we try to insert threads evenly and superficially in the subdermal layer, it is impossible to evenly insert the needle or cannula precisely in one plane from temple region to jaw line across the zygoma as face lifting surgery. After examining cadaver after inserting the barbed threads, it is found that the thick barbed threads usually run partially above and below the SMAS layer.

Of course, lifting with barbed threads which pass the SMAS layer cannot provide the same lifting effect as face lifting surgery, in which SMAS is dissected, lifted and fixed. But, it would be more effective to pull the SMAS and ligamentous structure, skin and fat layers together rather than simply pulling only the skin and superficial fat layer.

However, when performing the barbed thread lifting on the frontal facial part, which affects movements of the face, it is important to change the insertion layer to subcutaneous fat layer from the layer under the SMAS where the treatment is performed in case of lateral face. Among the various upper lip elevator muscles used for laughing and lip elevation, the zygomaticus major muscle is especially important for elevating the upper lip. Therefore, it is advisable to confirm the location of this muscle and understand the anatomical position by making the patient smile or open the mouth, preventing inconvenience associated with the muscle movement that may be caused by the procedure. Typically, the zygomaticus major muscle originates from a zygomatic bone on the line connecting the lateral canthus and the inferior margin of the ear lobe, and is inserted into the modiolus, which is located slightly below the mouth corner.

As advancing forward, clinicians should be careful when changing the insertion plane of the thread. If you are too close to the skin and thereby, the skins are crumpled or dimpled, retract the needle or cannula to find a depth that does not cause this problem visually.