The Art and Science of Thread Lifting

Based on Pinch Anatomy

Bongcheol Kim
Seungmin Oh
Wonsug Jung

Springer

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Bongcheol Kim
Lamar Clinic Isu Branch
Seoul
South Korea

Wonsug Jung
Department of Anatomy
Gachon University College of Medicine
Incheon
South Korea

Seungmin Oh
ON Clinic
Seoul
South Korea

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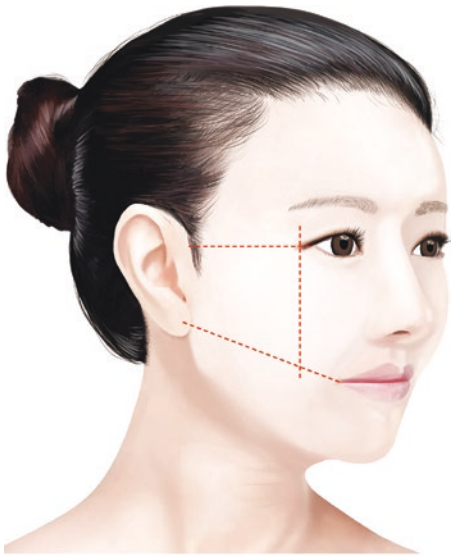
Foreword

Looking back to when I first started thread lifting, it was at a point in my career when I was deeply engrossed in looking for different methods to help patients look younger. Of course, the surgical approach would be most ideal and effective, but these surgical techniques are not realistically possible to do in an aesthetic clinic. Therefore, I naturally became interested in lifting using absorbable threads.

Date: Name:

Thread: Age:

Temporal muscle hypertrophy	(	)
Temporal hollowness	(	)
Zygomatic bone prominence	(	)
Zygomatic bone op scar	(	)
Jaw surgery	(	)
Sunken cheek	(	)
Liposuction	(	)
Acnescar	(	)
Thread lifting / HIFU	(	)
Masseter muscle hypertrophy	(	)
Marionette line	(	)
Cheek fat	(	)
Submental fat	(	)
Lat. Canthus elevation	(	)
Asymmetry	(	)
Zygomaticus muscle action	(	)
Simulation vector	(	)

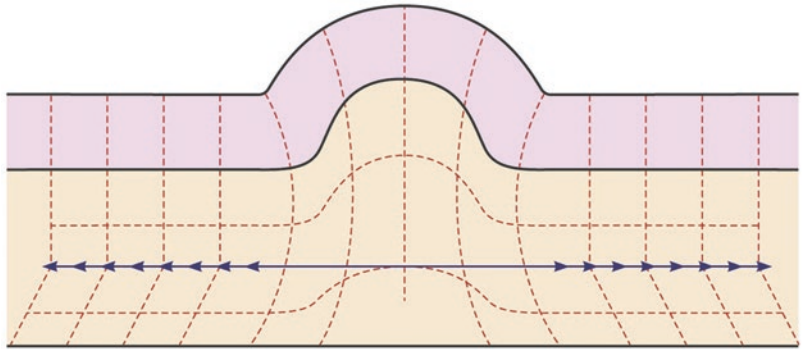


Patient's demand:

Effect:

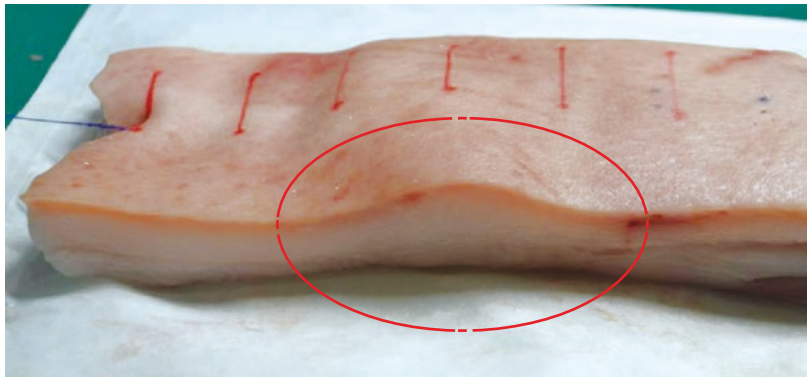
Starting with simple absorbable mono-thread procedures, I passed through many stages of research and experience finally bringing me to this point now where I feel the need to share my journey and knowledge with the medical community.

The above figure is a chart I developed from the accumulation of my clinical and anatomical experience and knowledge which can be used to plan thread lifting procedures. Many discussions and sharing with other medical doctors have also contributed to the completion of this chart.



In my early years of using threads, I would attend numerous thread lifting seminars and spend the whole night pondering and working out endless questions and problems in my head. However, since threads were new and there were very little published information on them, it was very difficult to find clear evidence-based explanations to my questions. Most doctors would just say that you need to try it for yourself to find the answer.

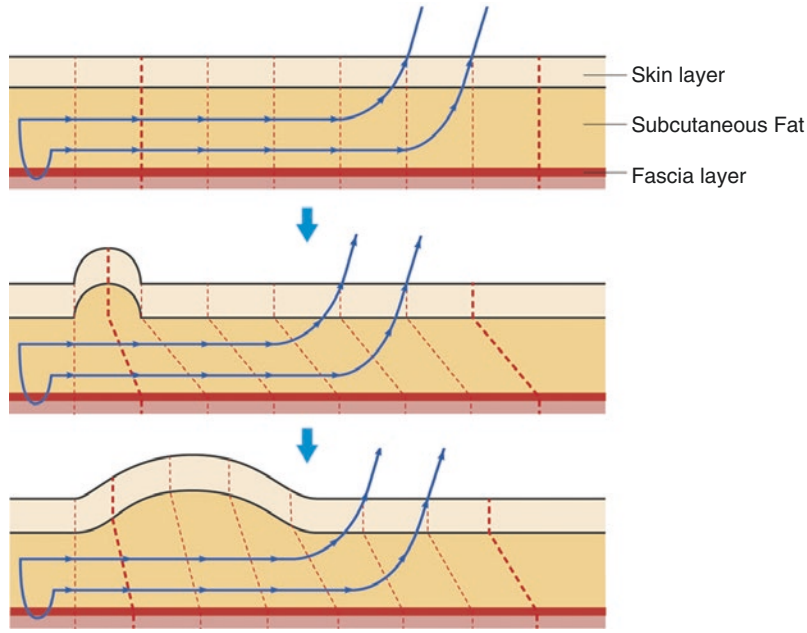
I decided that the only choice was to experiment myself and continue to research with other colleagues to find the principles I was looking for. The above figure shows schematically the lifting mechanism of bidirectional cog threads. It depicts very simply how bidirectional cog threads can create a lifting effect.



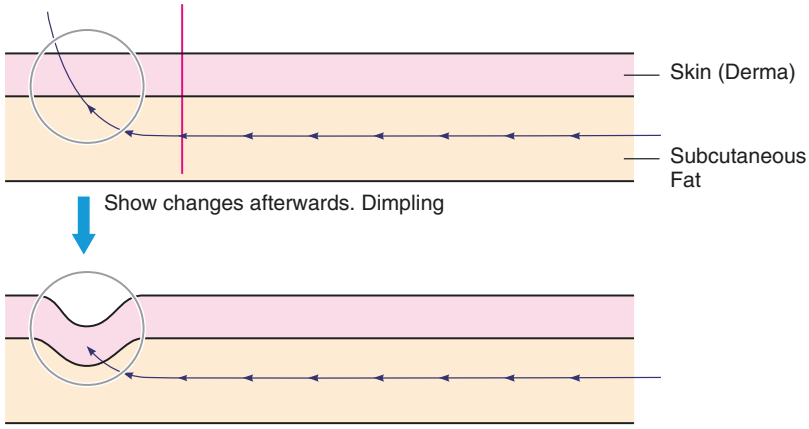
The photograph shows the lifting effects created by bidirectional cog threads in porcine tissue. As seen in the experimental porcine tissue, I tried to prove what only existed in my mind through actual experimentation. I still remember the joy of being able to physically prove the hypothetical reality and theory which existed in my mind.

As my research accumulated one by one, the answers to ‘what are the more effective and safe thread lifting methods’ began to emerge.

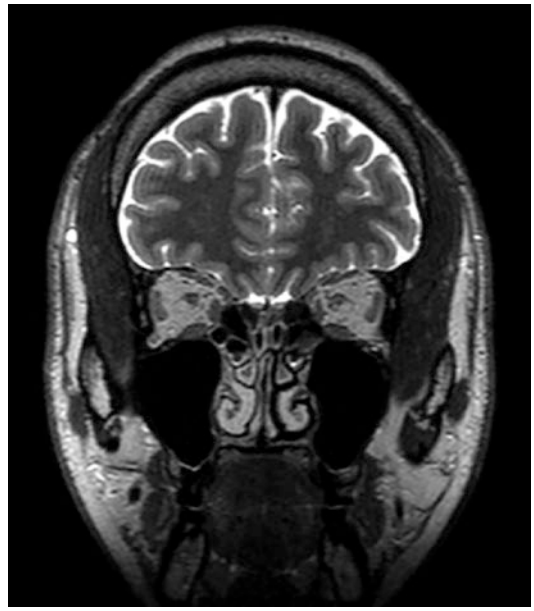
One of them was to know how to pull the skin effectively to minimizing damage to blood vessels and nerves.



The process of compiling results and knowledge through research and experimentation studies was very difficult and challenging. However, as time passed by, these results started to form into a more organized system.



It took numerous hours to write this book for the purpose of introducing safe and effective methodology to perform thread lifting. We hope that this book will serve to assist many doctors who are currently experiencing difficulties with thread lifting and who would like to perform these procedures after understanding the underlying mechanisms of thread lifting. We also sincerely hope that all doctors who read my book do not have to experience the difficulties which I had to go through to learn safe and effective thread procedures.



I would like to note that this book also contains experimental results of the authors and their hypotheses. These will be areas requiring further research in various fields in the future.

Through publishing this book, we also hope to make a meaningful relationship with many other doctors around the world who are interested in furthering the expertise in this field of aesthetic medicine. We also look forward to seeing more future publications which can build upon and surpass the content we have set forth here.

Seoul, South Korea — Bongcheol Kim
Seoul, South Korea — Seungmin Oh
Incheon, South Korea — Wonsug Jung

Note of Appreciation

Since we gathered with mutual desire of pursuing a goal of writing a book on thread lifting, several seasons have passed. Time to time, when the progress was slow and resolution could not be made, we encouraged each other to reach this place. To complete writing within a set period, we often become very tired of working restlessly. However now, we are at our final destination. Without the mutual trust in each other, we do not think we could have arrived here.

The biggest gift from writing this book may be the mutual trust in each other. Although there are remaining areas yet to be completed and to be further researched, we think that this would be helpful to those doctors who are interested in thread lifting. We would like to first thank our families who supported and encouraged us and stayed by our side as we wrote this book. Also, we are grateful to various doctors who helped us in obtaining knowledge in threads. Dr. Jihyun Lee helped us in dissection of cadavers and tissue processing. Especially, we would like to give many thanks here to Dr. Kwan Hyun Youn who completed the excellent anatomy illustrations with much effort. We promise to ourselves through this book we will continue to try with the attitude of studying continuously in the future, and we hope to contribute to brightening the bigger world for the cosmetic medicine of Korea.

Co-authors:

Seoul, South Korea — Seungmin Oh
Seoul, South Korea — Bongcheol Kim
Incheon, South Korea — Wonsug Jung

Prior Researches

There has been inadequate high quality studies conducted on absorbable thread lifting. It is difficult to find studies that clarify the mechanism and studies regarding its effect are still in progress. Physicians inevitably have no choice but to refer to studies on non-absorbable thread lifting. Nevertheless, knowledge of facial anatomy can be applied to lifting threads regardless of its bio-absorbability.

According to Mendelson, the face is divided into the mobile frontal and the fixed lateral regions, which are separated by the vertical line from the lateral canthus. To ensure successful non-absorbable thread lifting outcomes, it is important to have a solid understanding of the distinctive characteristics of each region.

Recently, interesting results have been published from research conducted in Korea. In this study, cog and twin threads were placed and the patients were followed over a period of 24 weeks. Clinical improvement in both lifting and quality of skin texture was observed but satisfaction was higher for quality of skin texture than for lifting. The authors of the study attribute the lower satisfaction in lifting to the lack of anchoring.

Lifting effect is contingent upon anchoring. Inserting mono-threads or inserting cog threads in the subcutaneous layer and simply tugging will not yield sufficient lifting effects. For effective lifting results, a thorough understanding of fixation points is necessary. Therefore, the authors focus first and foremost on fixation points in this book.

On the other hand, there is a study that states that regardless of the plane of thread insertion, deeper tissue repositioning and augmentation is necessary to induce lifting. This is a very important point.

Analysis of structural changes with aging show that reduction in volume is a major factor in aging. Therefore, antiaging/rejuvenation treatments such as filler injections that replenish lost volume yield good clinical outcomes. These procedures are generally called “volumizing-lifting”. Adding lost volume with fillers or autologous fat has the effect of shifting the deeper tissues via augmentation.

Volumizing using fillers and other materials is definitely an effective procedure. However, in patients with ptosis of skin and fat tissue due to lack of elasticity associated with aging, volumization procedures alone may not be effective. In such cases, performing volumizing procedures in conjunction with lifting procedure may result in more favorable outcomes.

To scientifically demonstrate the aforementioned clinical outcomes, the authors are planning to conduct a study called “Lifting in conjunction with volumization procedures is more effective than volumization alone.”

This book also introduces case that demonstrates tissue repositioning with thread lifting via 3D scanning. The authors anticipate that a lot of research will be conducted on this subject.

Current Status of Thread Lifting

After absorbable thread treatments became widespread, the authors collected patient feedback on thread lifting results. Both positive and negative comments have been received.

Below is the list of negative responses.

- The limited effect.
- Short longevity of effect.
- Possibility of severe bruising and swelling.
- Possibility of skin dimpling.
- Difficulty/inconvenience in speaking.

Efforts to address the negative responses must be made. This book contains clinical studies, experiments, and experiences that have been conducted so far. We received help from specialists in various fields, and further research is also planned.

This book addresses how to overcome the negative responses and explains how to perform effective, long lasting thread lifting procedures while avoiding complications such as swelling and skin dimpling. Complication management is also discussed.

Author's Profile

Bongcheol Kim

Director of Lamar Isu Clinic
College of Medicine, Chonnam National University
Internship – Samsung Medical Center (Seoul)
Residency – Samsung Medical Center (Seoul)
Vice president of the Korean Association for Laser, Dermatology and Trichology
KOL of Silhouette Soft®
KOL of QT Lift®

Seungmin Oh

Director of ON Clinic
College of Medicine, Seoul National University
Internship – Seoul National University Hospital
Residency – Seoul National University Hospital
Medical MBA, Kyung Hee University
President of OK Medi. Co., Ltd.
Executive Board Member of the Korean Association for Laser, Dermatology and Trichology
KOL of QT Lift®
Advisory Board Member of Hugel Co., Ltd.

Wonsug Jung

Assistant Professor, Department of Anatomy, Gachon University College of Medicine
Graduated from Yonsei University College of Medicine, MD
Graduated from Yonsei University Graduate School, PhD
Member of the Korean Association of Anatomists
Member of the Korean Association of Physical Anthropologists

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Part I

Why Is Fixing Technique Important?

Definition of Terms

1

A successful and effective lifting treatment must be based on a thorough understanding of changes to the face due to aging. In addition, learning clear meaning of various terms used in explaining lifting is necessary.

Among the key contents used in the book, the authors obtained some of them through experiencing lifting actually. As such, if we start without clarifying the meaning of words, confusion or curiosity may occur. Accordingly, we think it is necessary to start our story after clarifying the definition and the meaning of some important terms.

1.1 Fixing Point

There are three important terms in absorbable thread lifting. The first one is the fixing point, the second one is the direction, and the third one is the hanging point.

As mentioned above, the concept of the fixing point is important while performing thread lifting procedure. Previous studies on the effect of thread lifting have been made without proper anchoring. This tells the reason for the poor lifting effect. A fixing point means the point which receives the pulling force when a certain part of the face is being pulled. Taking bungee jumping as an example would help to understand. Provided that jumping is done after connecting the jumping stand and the body with the rope for jumping, the jumping stand to which the rope is tied would be the fixing point.

1.2 Direction

Direction in lifting procedure means the vector from the hanging point to the fixing point. Direction must exist to call lifting real and a desired shape can be made. Simple thread inserting procedures without direction do not make the desired shape, whereas a lifting procedure can create a lifting effect and desired face shape with a suitable direction from the hanging point to the fixing point.

1.3 Hanging Point

The hanging point refers to the point at the end of the thread when the thread was inserted from the fixing point to the direction of the facial part to be pulled. In the example of pulling a sagged cheek upward, the hanging point exists at a point between the fixing point and the sagged cheek to be pulled (Fig. 1.1).

In some cases, the hanging point does not precisely coincide with the part to be lifted (Fig. 1.2). Lifting still can be possible. This is because facial tissues are intricately connected to each other by fibrotic tissues in the subcutaneous fat layer or various ligaments, etc. Especially,

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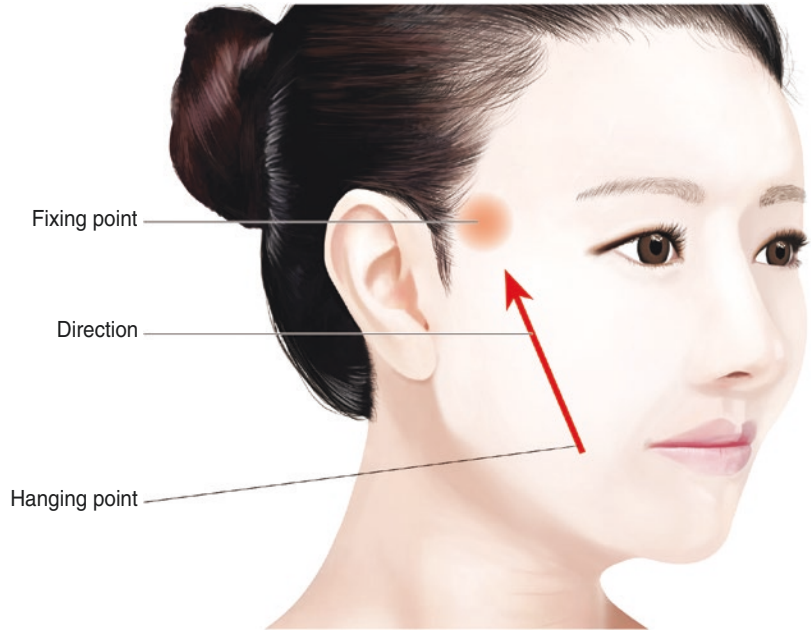

Fig. 1.1 Definition of fixing point, hanging point, and direction. Pulling the hanging point to the direction of the fixing point is facial lifting

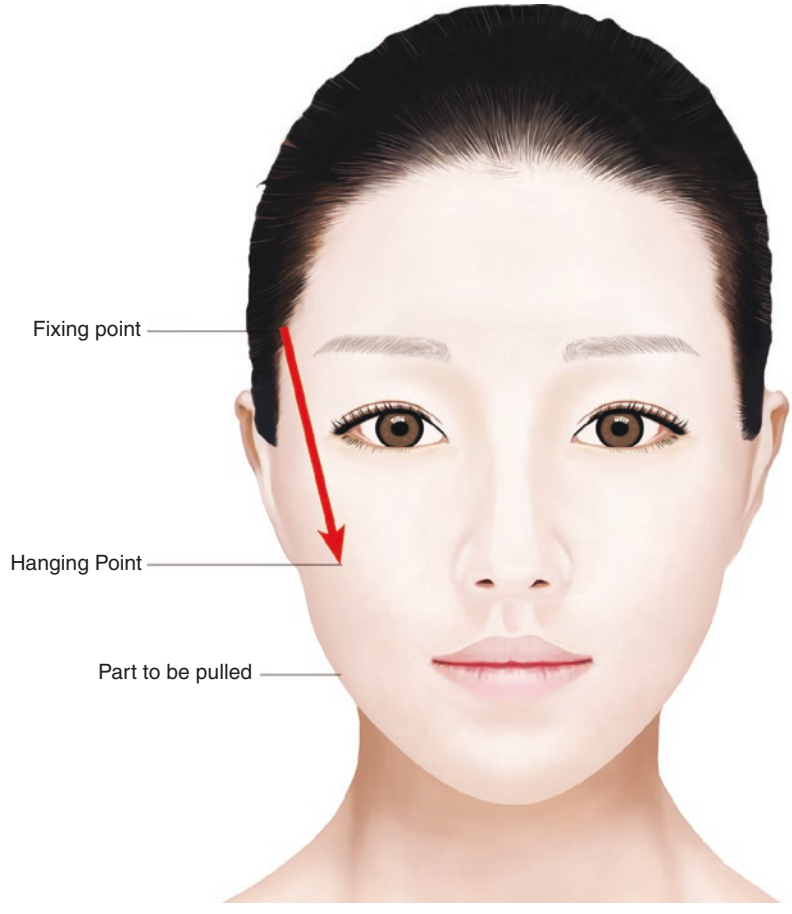

Fig. 1.2 If the hanging point and the part to be pulled do not coincide, the actual part to be pulled is either the lower cheek or the hanging point of the thread which is the lower cheekbone. The hanging point and the part to be pulled are different

certain areas on the face such as the lower cheekbone area and the fibrotic tissue in the subcutaneous layer are very tough and dense. If a thread is inserted into such fibrotic tissues and pulled, these dense tissues will be pulled effectively, and tissues which are located away from the hanging point also pulled. For example, to lift the lower cheek part to the direction of the head, the thread does not necessarily have to be inserted in the lower cheek area to create a lifting effect.

However, in a certain patient group, inserting and pulling a thread only to the hard fibrotic tissue in the lower cheekbone area can bring a good effect. Therefore, patients and procedure technique selection should be well considered before treatment.

Importance of the Fixing Point

2

The difference between the lifting technique which can make a fixing point and the lifting technique which cannot make a fixing point is that the former clearly has direction. Various procedures which contract the skin or reduce the fat layer can make the face to appear pulled. Namely, even if there is no direction, the face can look lifted and tightened. This is related to the changes to the face as a result of aging.

As aging progresses, each plane of the face goes through changes. Various changes such as sagging of fat due to gravity, stretching of fibrotic tissues surrounding the fat, and stretching of the skin together make the aging appearance of the face.

If the skin is contracted or the fat layer is reduced, as they have effects of tightening stretched tissues, they are thought to be able to bring the similar effect of lifting. Also, through various procedures, various fibrotic tissues existing in the face can be settled and newly formed.

However, this is thought to have weaker effects than the lifting procedure which strongly forms a fixing point. The concept of the fixing point has been passed down from the past. Sulamanidze M. et al. said that thread lifting procedures consist of floating method and fixing method. Mendelson et al. classified the face into the frontal part which moves and the lateral part which is fixed.

In this regard, Hyeonho Han et al. announced that the performance of thread lifting with fixing type in the lateral part of the face and floating type in the frontal part of the face together showed good results.

The fixed type discussed here means forming a strong fixing point on the temporal fascia area. This is an important thesis discussing about the importance of the fixing point (Fig. 2.1).

To optimize lifting effects, pulling must be done with direction, and a strong fixing point must exist from the pulling direction. This is because force must support in the opposing direction from the movement of the tissues resulting from aging and gravity.

Although there is relative amount of difference in strength, each thread lifting techniques have the mechanisms of making a fixing point or roles which function the same as the fixing point. In some cases, the basis was uncovered through animal testing, and in some cases basis is not made clear. Fixing a thread in the fascia area is thought to be the strongest technique. However, this technique is not easy, and also when bleeding, the duration of the procedure takes longer, and side effects such as hematoma can possibly occur.

If knowledge can minimize the possibility of bleeding while making the fixing point strong and procedural skills are clearly made, we think

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that safe and effective thread lifting can be performed.

This is also the reason for talking about the fixing point first in this book. The authors performed several experiments to understand thread lifting mechanisms in the body. They will be helpful in understanding the mechanisms of thread lifting.

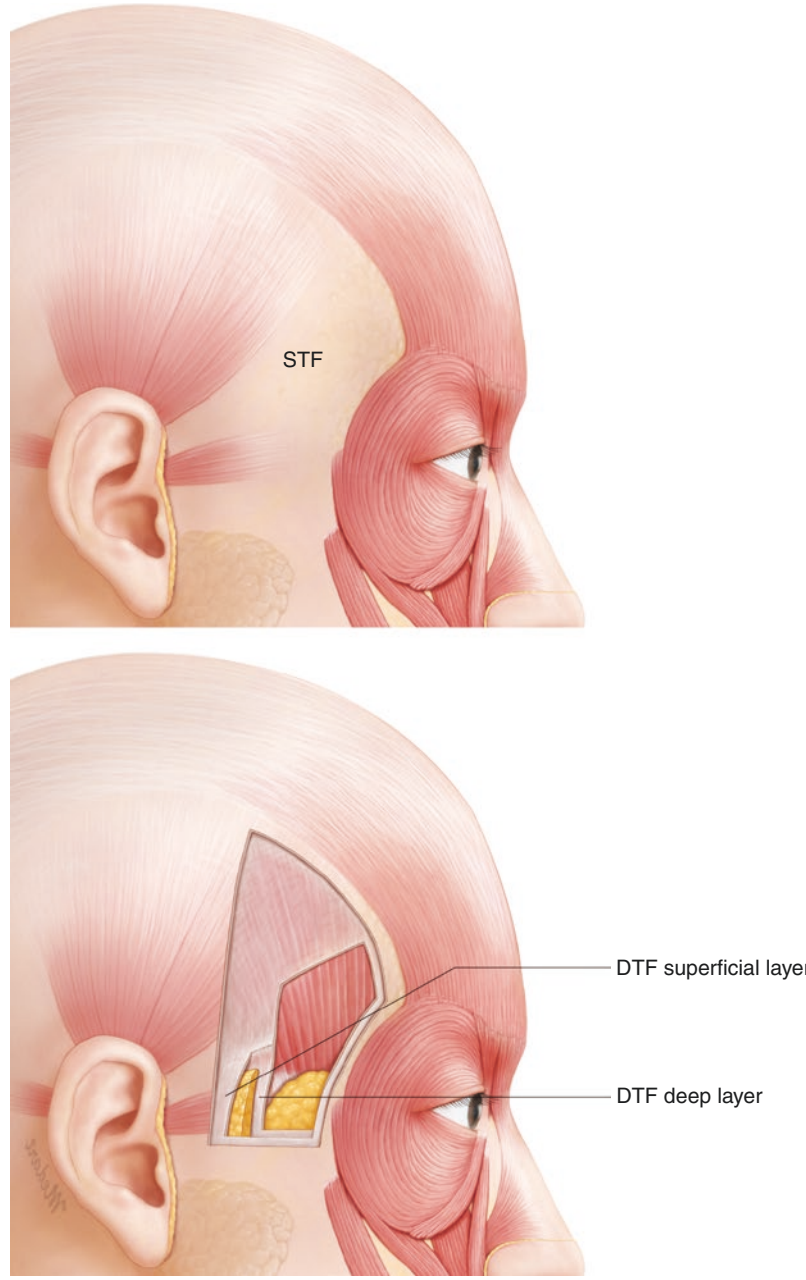

Fig. 2.1 Temporal fascia. Showing the superficial temporal fascia and the deep temporal fascia. The deep temporal fascia has a part which divides into the deep layer and the superficial layer. *STF* Superficial Temporal Fascia, *DTF* Deep Temporal Fascia (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

3 What Is a Fixing Point Formed in Lifting Procedures?

3.1 Method of Making a Fixing Point

The mechanism of mono-thread used in the first-generation absorbable thread lifting is expressed through this (Fig. 3.1).

Physicians expected lifting effects by inserting more threads in the direction that the face was desired to be pulled. It will be explained in the later part of this book that when the absorbable ingredient, PDO, enters into the tissue, various changes occur. Especially, changes such as contraction of tissues and proliferation of fibrotic tissues prove to some extent the theoretical basis for the thread lifting using mono-threads (Yoon JH, et al. Tissue changes over time after polydioxanone thread insertion: An animal study with pigs. J Cosmet Dermatol. 2018;00:1–7).

The fixing point forming mechanism is as varied as the thread lifting type. In this regard, there are not many cases which adequately explain such mechanisms. For example, they are not able to accurately explain why bi-directional cog thread or mono-thread technique causes facial lifting.

But lifting is obviously possible if the thread is hanging in a relatively firm fascia region, runs in the subcutaneous fat layer, and is then pulled. Of course, discussions about the lasting time and whether the thread really hangs in the fascia, etc. will be dealt with later. However, the lifting procedure using the method of hanging the thread in the hard fascia area and pulling is not easy to fol-

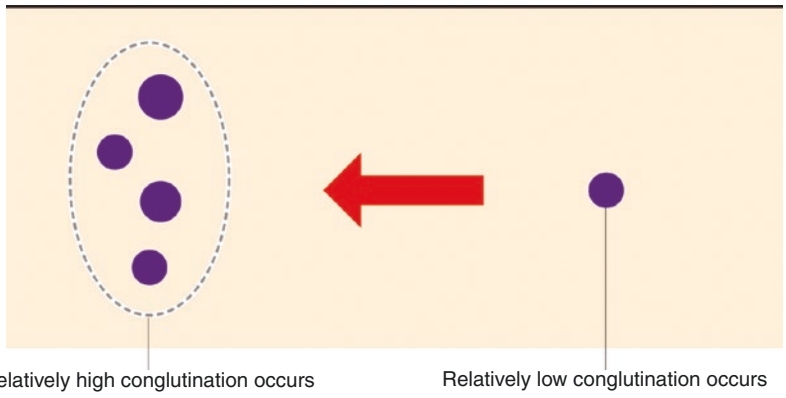

Fig. 3.1 Forming a fixing point of monofilament threads. Formation of fibrotic tissues occurs more in the area where relatively many threads were inserted. No clear fixing point exists

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low due to its level of difficulty. Based on the recent trend, if there is any lifting method which can make a hard fixing point with short and simple procedure without any side effect, it would be the most ideal.

Recently, lifting is performed in the form of gathering tissues in the middle part of the thread using a bi-directional cog thread. This will be explained in the following figure, and a point which serves the similar function as a fixing point occurs in the middle part of the thread. Such method is more accurately explained as soft tissue repositioning rather than lifting.

After inserting a bi-directional cog thread and tying the threads to each other in the insertion area, the role of the fixing point can be strengthened. This is a case where the knot formed by the tie serves as a weak fixing point.

There is also a method of forming a fixing point using the hard ligament tissue in the inner side of the face. By causing the cog thread to be hung in the area of the true ligament, a hard fixing point can be formed. Places to which such special technique can be applied exist, and it can make results better than the mono-thread insertion method.

Part II

Facial Anatomy for Non-surgical Thread Lifting

4 Anatomy for Absorbable Thread Lifting

4.1 Layers of the Face

Like the scalp, the facial tissue can be divided into five layers. And the face and the scalp are connected to each other layer by layer. There is an exception in the fifth layer where masticatory muscles have different embryological origins from facial expression muscles (Table 4.1 and Fig. 4.1).

4.1.1 Skin

In general, the skin of the male is slightly thicker than the female. And the thickness of the dermis of Koreans does not differ largely from that of Caucasians. However, the epidermis of Koreans tends to be thicker than that of Caucasians.

Table 4.2 lists the skin thickness by area based on a Korean study. It is noteworthy that the neck being the thickest among all the area measured is not a common finding in other studies. These inter-study variations probably result from the differences in the population of study and methods of measurement.

4.1.2 Superficial Fat

It is a layer corresponding to the hypodermis. It is located superficial to the facial expression muscles and consists of several compartments. Superficial fat sags downward by aging (Fig. 4.2).

4.1.3 Musculo-aponeurotic Layer/ SMAS

This layer consists of facial expression muscles and aponeurosis. And the layer is connected to the galea aponeurotica of the scalp.

Aponeurosis interconnects the platysma muscle and frontalis muscle. The aponeurosis is named differently by its relative location to the zygomatic arch; the aponeurosis upper to the zygomatic arch is being called the temporoparietal fascia or superficial temporal fascia and the part lower to the zygomatic arch the SMAS (superficial musculo-aponeurotic system).

The branches of the facial nerve innervating the facial expression muscles travel deeper than this layer, and some blood vessels (e.g., superficial temporal artery) travel within the temporoparietal fascia.

Table 4.1 Layers of the face

	Facial layer	Scalp layer
First layer	Skin	Skin
Second layer	Superficial fat	Connective tissue
Third layer	Facial expression muscle/ SMAS (musculo-aponeurotic layer)	Aponeurosis
Fourth layer	Deep fat	Loose areolar tissue
Fifth layer	Deep fascia	Periosteum

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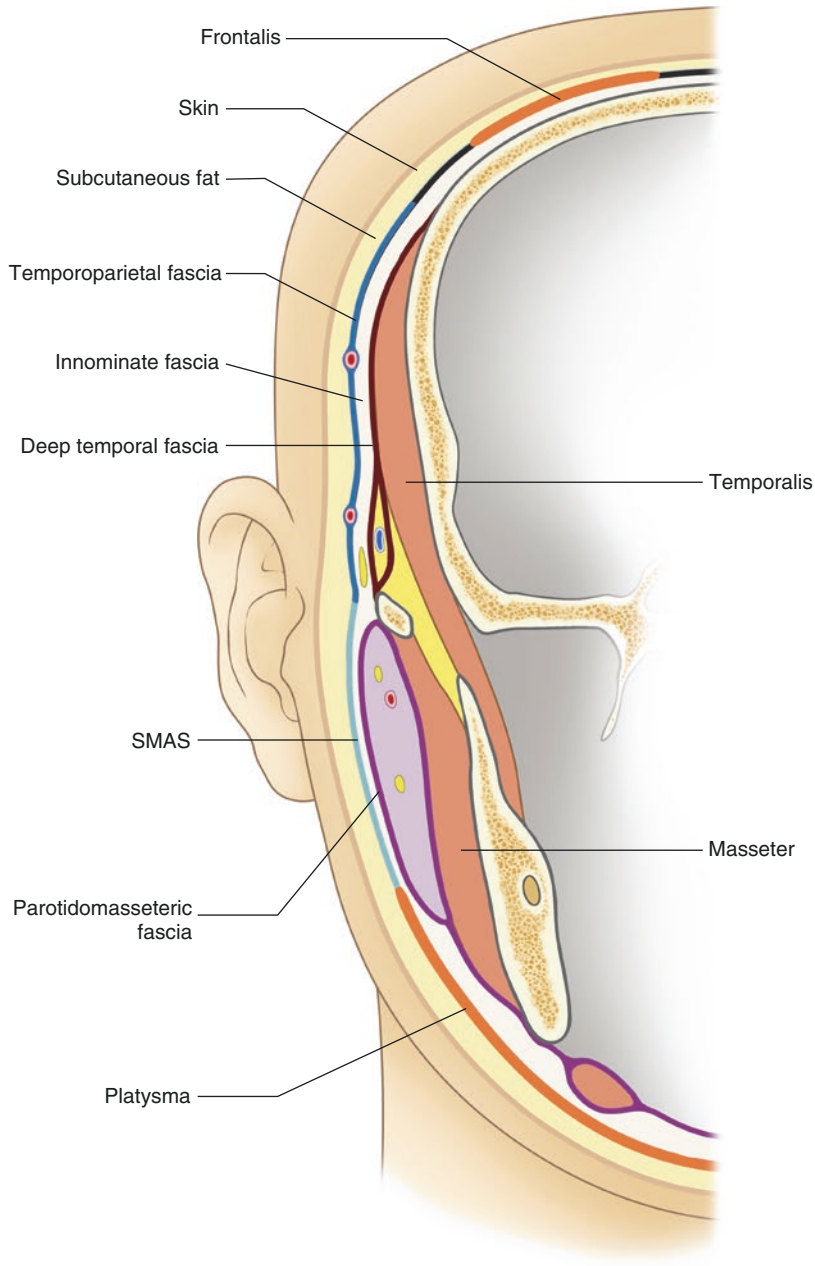


Fig. 4.1 Facial layers. The coronal section of the face is represented schematically. (Published with kind permission of © Kwan-Hyun Youn 2018. All rights reserved)

Table 4.2 Skin thickness of Koreans

	Male	Female
Forehead	0.90 mm	0.84 mm
Eyelid	0.57 mm	0.47 mm
Cheek	1.24 mm	1.04 mm
Chin	0.89 mm	0.75 mm
Neck	1.56 mm	1.26 mm

4.1.4 Deep Fat

In the fourth layer of the face, there are several spaces, and the retaining ligaments traverse between them connecting the periosteum/deep fascia to the skin. Deep fat is located deep to the facial expression muscles and divided into several

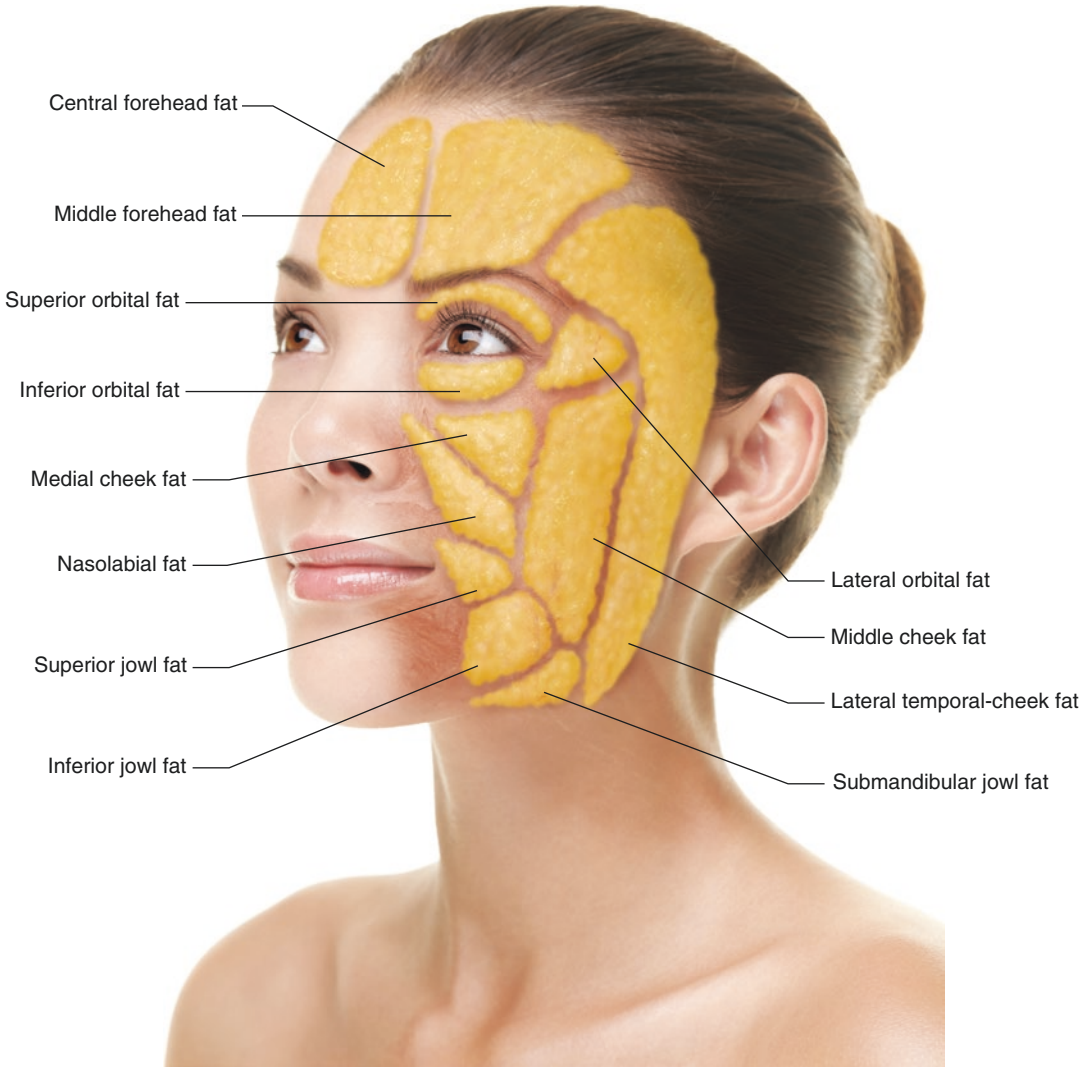


Fig. 4.2 Superficial fat compartments. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

compartments (Fig. 4.3). In the temporal area, the connective tissue beneath the temporoparietal fascia is called the innominate fascia.

4.1.5 Deep Fascia

There are masticatory muscles like temporalis m. and masseter m. in the temporal fossa and the mandible. The periosteum of the skull proceeds as the deep fascia covering muscles of mastication (Figs. 4.1 and 4.4).

The deep fascia over the temporalis m. is called the temporalis muscle fascia or the deep temporal fascia, and it attaches to the zygomatic arch after being split into a superficial and a deep layer. There is a superficial temporal fat pad in between the two layers of the deep temporal fascia and a deep temporal fat pad which is an extension of the buccal fat pad lying

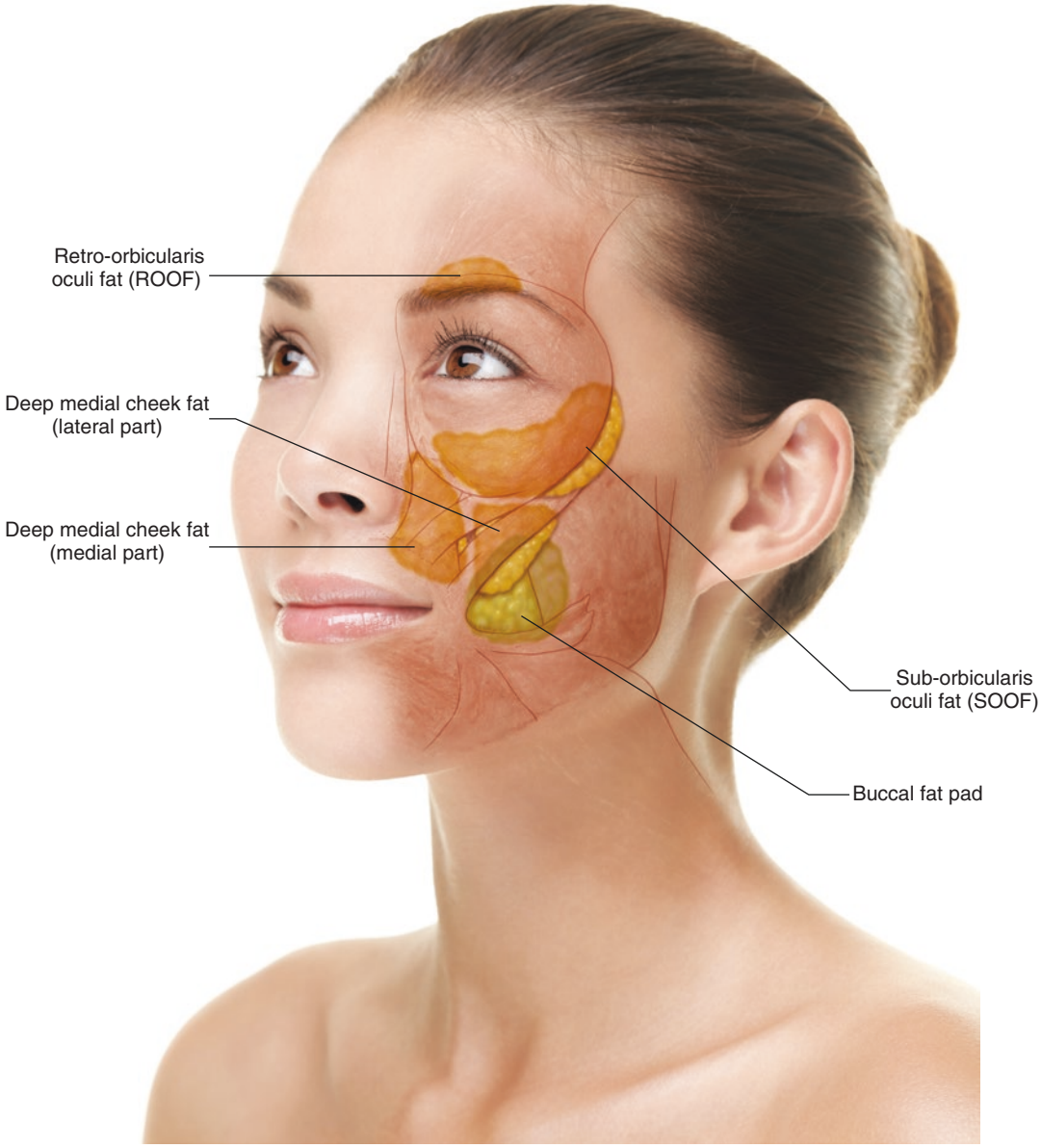


Fig. 4.3 Deep fat compartments. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

between the temporalis m. and the deep temporal fascia.

In the mandible, the deep fascia surrounds not only the masseter m. but also the parotid gland; hence, it is called as the parotidomasseteric fascia, and it also attaches to the zygomatic arch. The musculo-aponeurotic layer/SMAS is a continuous layer, crossing over the zygomatic arch, while the deep fasciae attach to the upper and lower borders of the zygomatic arch and are not one continuous layer.

The temporal branch of the facial nerve exits the parotid gland by penetrating the parotidomasseteric fascia, and after crossing the zygomatic arch, it traverses the innominate fascia to innervate the orbicularis oculi m. and frontalis m.

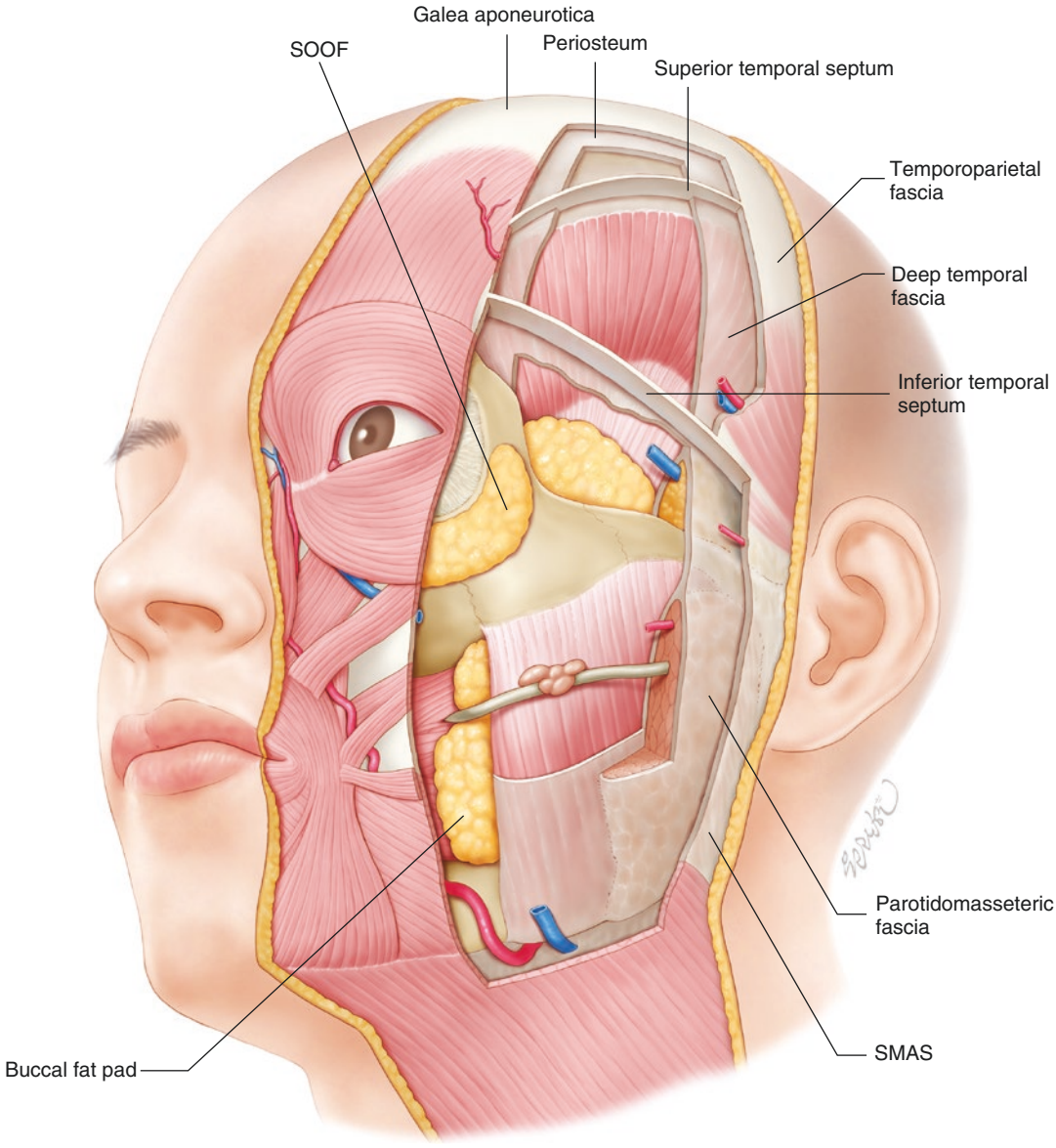
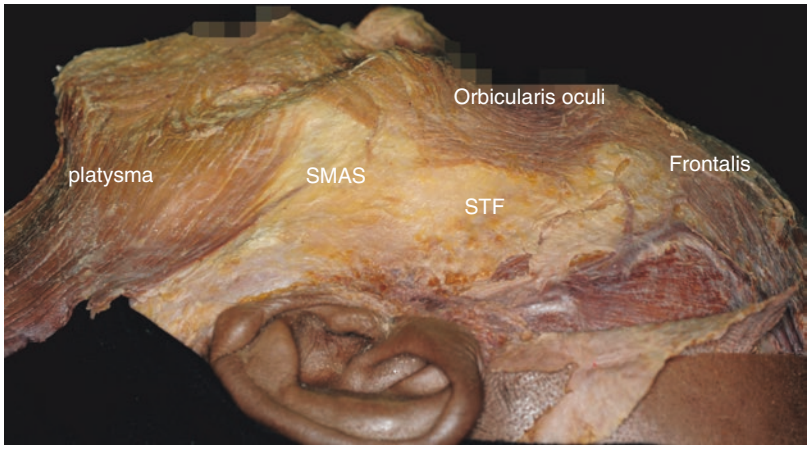
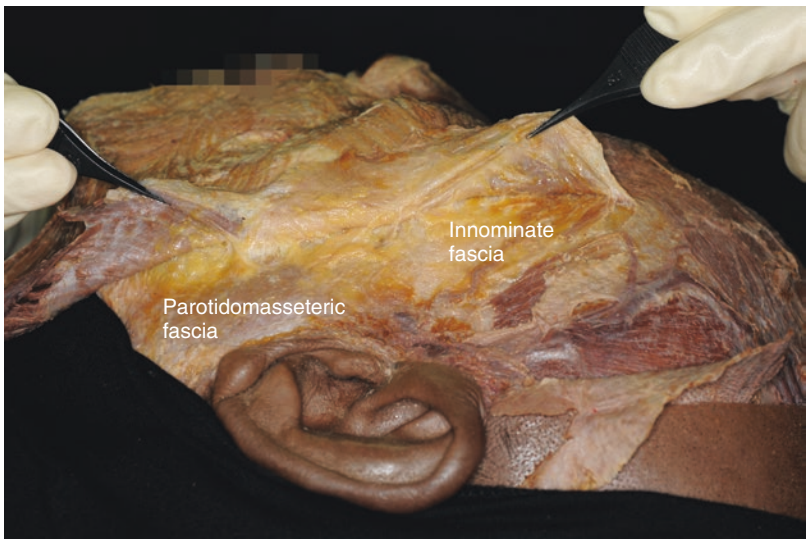


Fig. 4.4 Layers of the face. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

4.2 Cadaveric Photo Series of Facial Layers

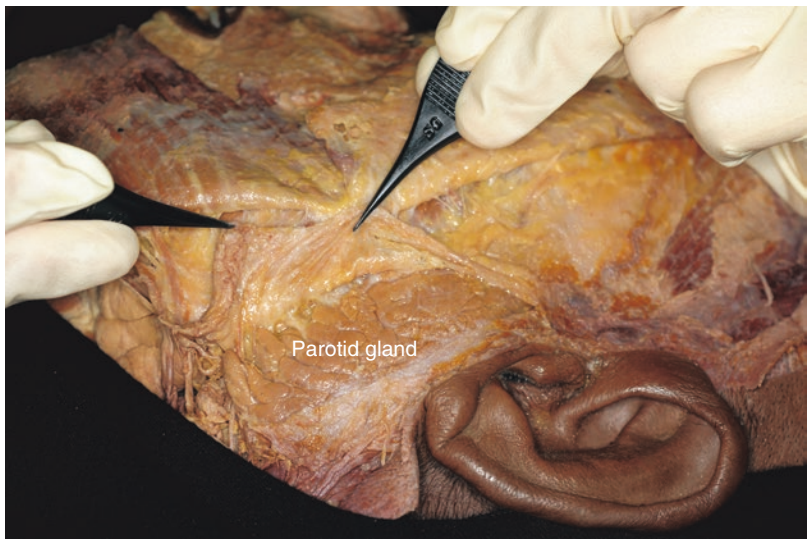


- After removing the skin and the subcutaneous fat tissues, the third layer, musculo-aponeurotic layer/SMAS, is exposed.
- Platysma, orbicularis oculi, and frontalis muscles and the interconnecting aponeurosis.
- The part of aponeurosis below the zygomatic arch is called SMAS; the part above the zygomatic arch is called the superficial temporal fascia (STF) or temporoparietal fascia.
- The musculo-aponeurotic layer/SMAS is the most important layer in the surgical lifting procedure.



- By lifting the SMAS layer, the parotidomasseteric fascia which is the deep fascia covering the parotid gland and the fourth layer in the temporal area, the innominate fascia, are exposed.

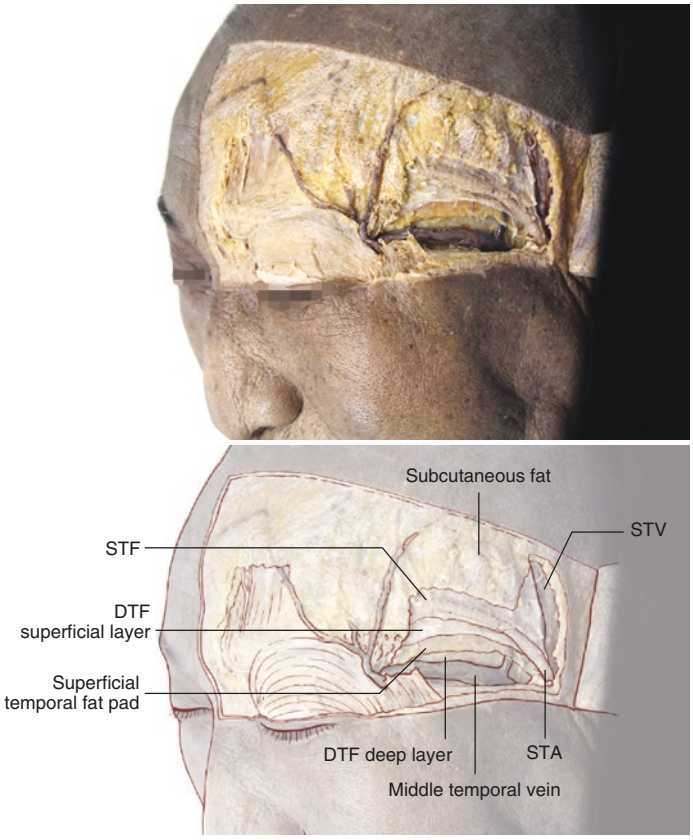
- The part of parotidomasseteric fascia covering the parotid gland is thicker than the part covering the masseter area.



- By lifting up the parotidomasseteric fascia, the parotid gland was exposed.

The branches of the facial nerve coming out of the borders of the parotid gland are clearly visible.

- The branches of the facial nerve travel within the parenchyma of the parotid gland.



- This is a cadaveric photo showing the layers of the temple.
- The superficial temporal artery (STA) is enclosed by the superficial temporal fascia (STF).
- The middle temporal vein is embedded in the superficial temporal fat between the superficial and deep layers of the deep temporal fascia.

- Note the presence of the temporoparietalis m. in the same layer as the superficial temporal fascia.

4.3 Anatomical Structures that Could Be Damaged During Thread Lifting

Although nonsurgical thread lifting is considered to be a minimally invasive procedure, some anatomical structures may be at risk of being damaged during treatment. Since thread lifting is performed mainly from the top to the bottom in a perpendicular direction, there is risk of injury in structures which course obliquely or horizontally in the lateral face (Fig. 4.5). Such structures are summarized in Table 4.3.

4.3.1 Blood Vessels

1. Frontal branch of the superficial temporal artery.
   - The superficial temporary artery bifurcates into frontal and parietal branches at 18 mm anterior and 37 mm superior to the tragus.
   - The frontal branch travels anterosuperiorly in the temple. It meets the lateral border of the frontalis muscle at 16 mm lateral to the lateral canthus and 15 mm above the eyebrow and then travels on the surface of the frontalis m. afterward (Fig. 4.6).
2. Zygomatico-orbital artery
   - As a branch of the superficial temporal artery, the zygomatico-orbital artery exists at 80–90% and runs parallel to the upper border of zygomatic arch toward the outer corner of the eye.
3. Transverse facial artery.
   - The transverse facial artery originates from the superficial temporal artery within the parotid gland and travels in the same depth as the facial nerves.
   - It travels in between the zygomatic arch and the parotid gland and runs approximately 14 mm (5–26 mm) below the lower border of the zygomatic arch.

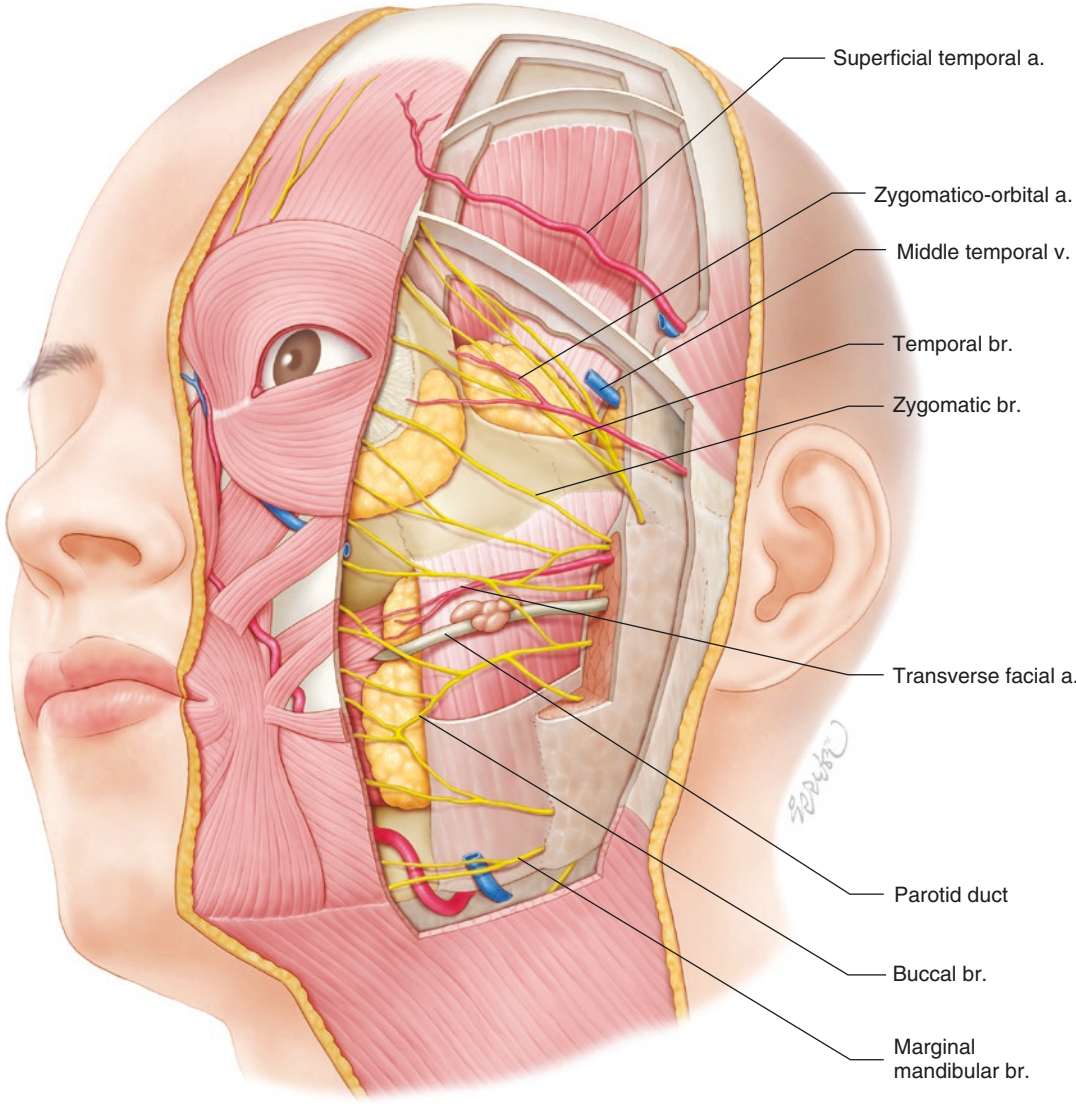


Fig. 4.5 Anatomical structures running the lateral face horizontally or obliquely. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

Table 4.3 Anatomical structures that could be damaged during thread lifting

Blood vessels	Frontal branch of superficial temporal artery
	Zygomatico-orbital artery
	Transverse facial artery
	Middle temporal vein
Nerves	Temporal, zygomatic, buccal, and marginal mandibular branches of the facial nerves
Other structure	Parotid duct

4. Middle temporal vein.
   - Middle temporal vein runs approximately 2 cm above the zygomatic arch and drains into the superficial temporal vein.
   - It runs between the superficial and deep layers of the deep temporal fascia and is embedded in the superficial temporal fat pad.

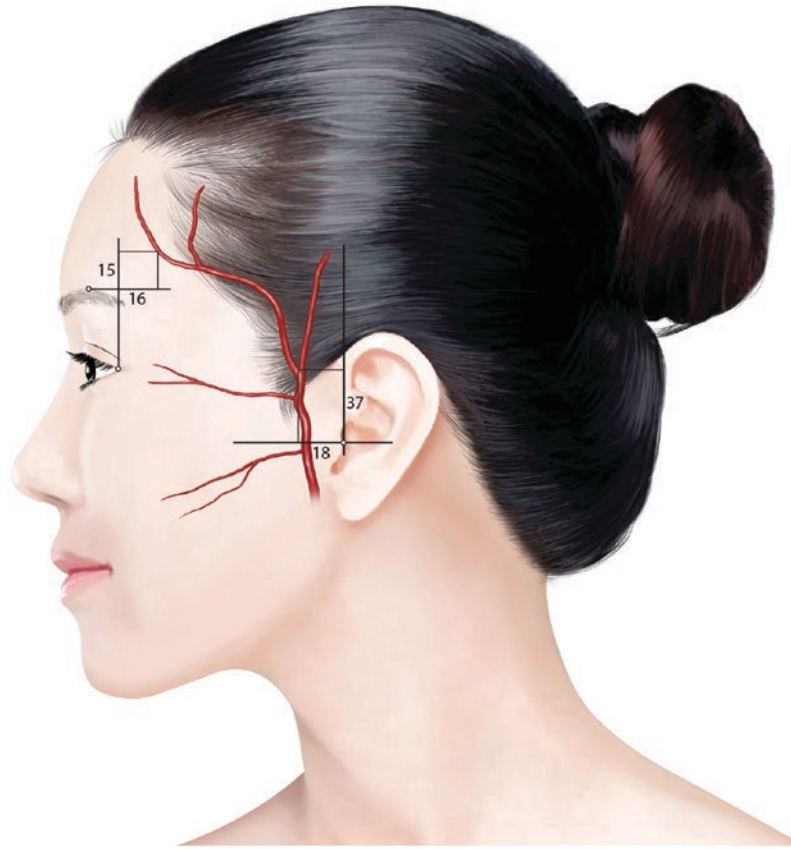


Fig. 4.6 The course of the superficial temporal artery. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

4.3.2 Nerves

- The temporal, zygomatic, buccal, and marginal mandibular branches of the facial nerve emerge from the parotid gland and run anteriorly beneath the SMAS.
- The temporal branch of the facial nerve exits the parotid gland by penetrating the parotidomasseteric fascia and travels up across the zygomatic arch covered by the innominate fascia. The temporal branch penetrates the innominate fascia at 1.5–3 cm above the zygomatic arch and runs just beneath the superficial temporal fascia.
- There are several temporal branches of the facial nerve, and they are located approximately within the triangle created by the earlobe, the hairline, and the lateral eyebrow.
- The temporal branch of the facial nerve courses along the Pitanguy's line which runs from a point 0.5 cm below the tragus to a point 1.5 cm above the lateral eyebrow.
- The temporal branch of the facial nerve crosses the middle third of the zygomatic arch which is 1.8 cm from the posterior end of the zygomatic arch and 2 cm from the anterior end of the arch (Fig. 4.7).

4.3.3 Parotid Duct

- Parotid duct generally runs above the line connecting the tragus and angle of the mouth.
- Parotid duct follows a curved trajectory from the 1/3 point and 2/3 point along the line connecting the tragus and the angle of the mouth, with the peak of curve being 1.5 cm above the line (Fig. 4.8).

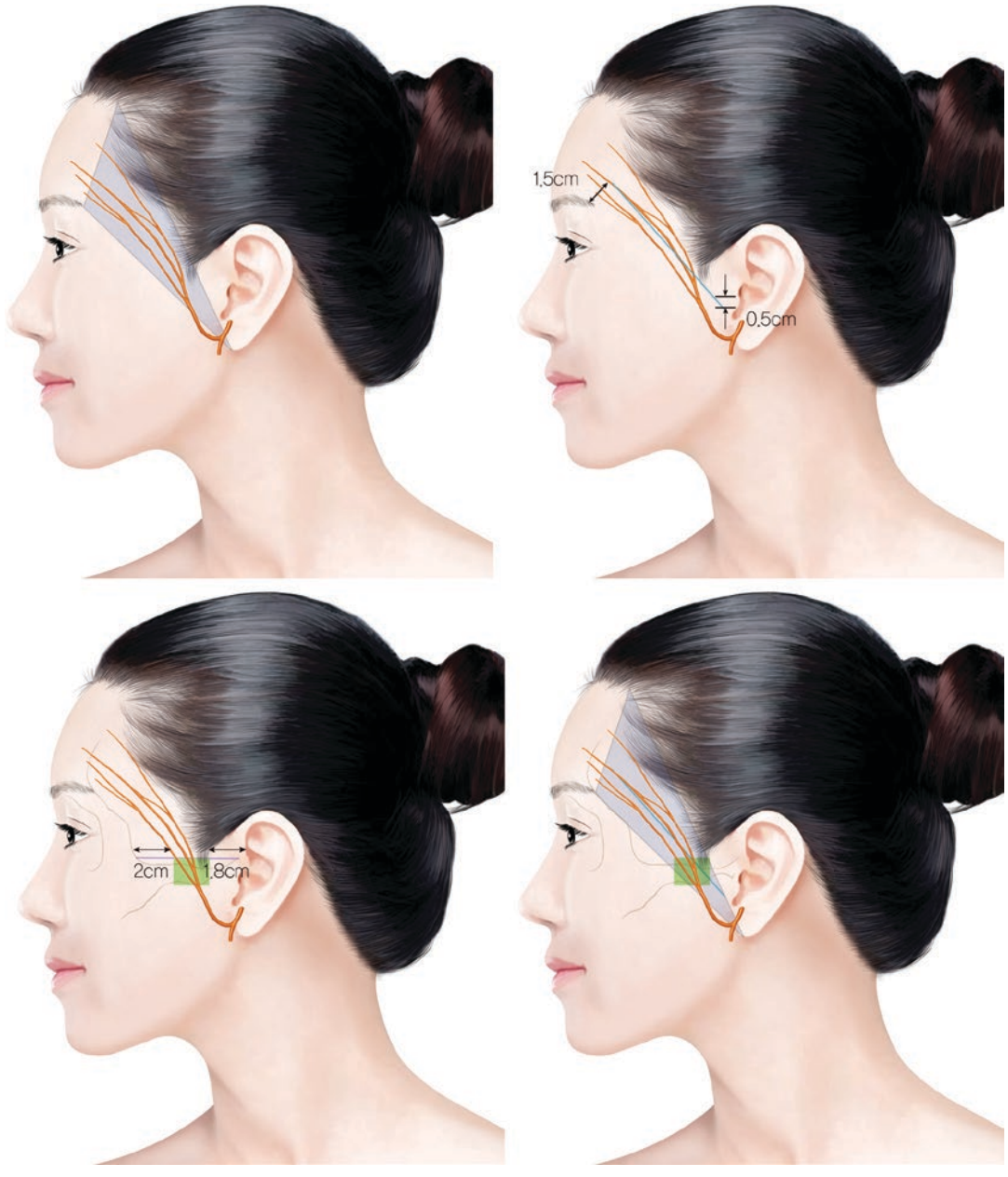


Fig. 4.7 Pathway of the temporal branches of the facial nerve. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

Fig. 4.8 The course of the parotid duct. (Published with kind permission of © Kwan- Hyun Youn 2018. All rights reserved)

The photographs of the above structures are composed on a model's face (Figs. 4.9, 4.10 and 4.11) and the histologic sections containing those structures are illustrated for reference (Fig. 4.12).

Fig. 4.9 Musculo-aponeurotic layer/SMAS. (Published with kind permission of © Wonsug Jung and Kwan- Hyun Youn 2018. All rights reserved)

Fig. 4.10 After removal of the SMAS and parotidomasseteric fascia, the parotid gland and branches of facial nerves exiting it can be seen. (Published with kind permission of © Wonsug Jung and Kwan- Hyun Youn 2018. All rights reserved)

Fig. 4.11 After removal of the superficial part of the parotid gland, the branching pattern of the facial nerve can be observed. (Published with kind permission of © Wonsug Jung and Kwan- Hyun Youn 2018. All rights reserved)

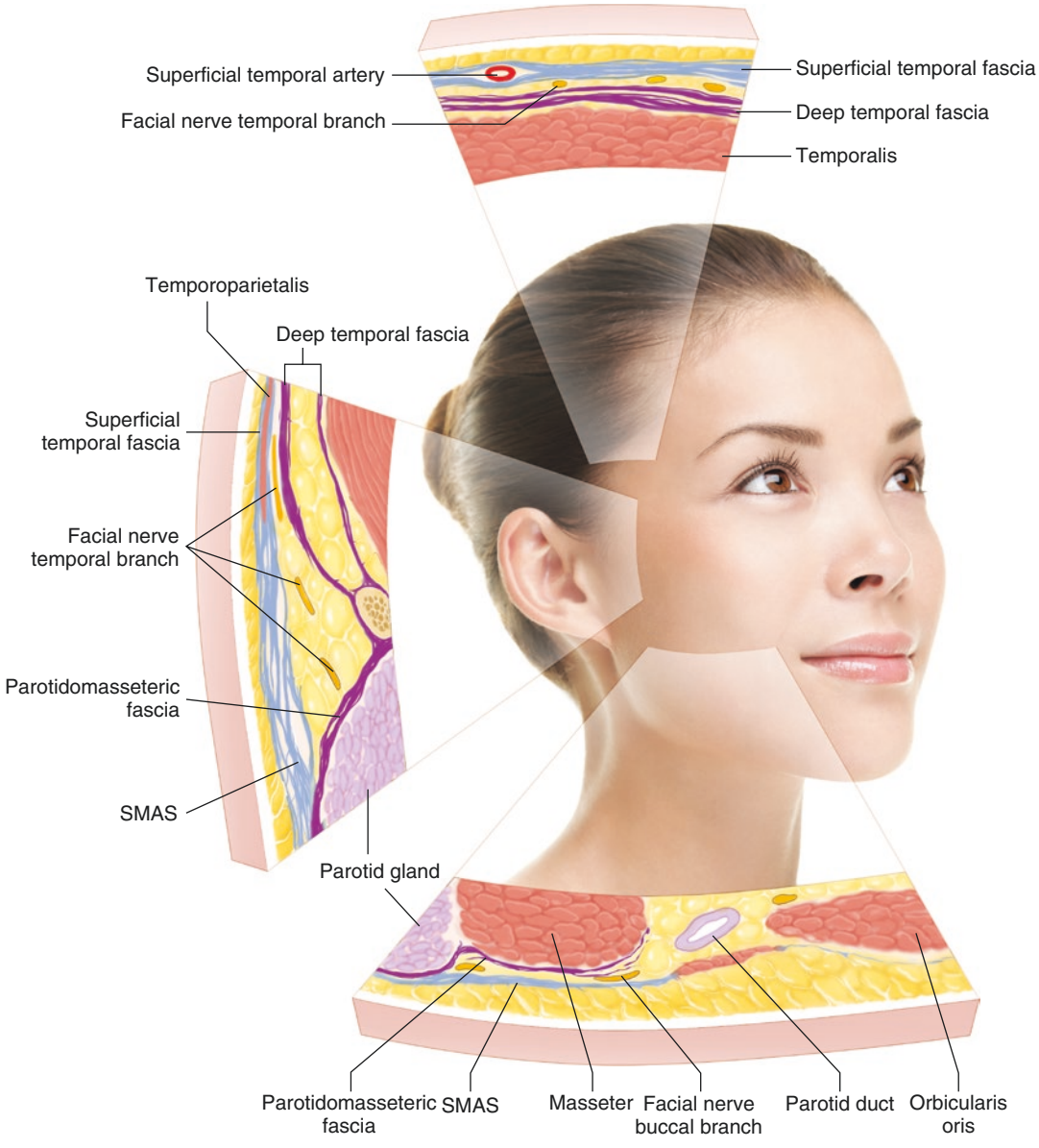


Fig. 4.12 Schematic drawing of the tissue specimen of each area of the face. (Published with kind permission of © Wonsug Jung and Kwan- Hyun Youn 2018. All rights reserved)