



# Fine-Tuning of the Supratip in Rhinoplasty: An External Approach

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## Abstract

**Background** Supratip deformity, also known as the pollybeak deformity, accounts for one of the most common iatrogenic deformities requiring revision surgery in rhinoplasty. We aimed to present a novel technique to prevent supratip deformity and increase the tip definition, especially in patients with thick skin.

**Methods** A total of eighty-three patients were included in the study. In control group, thirty-three consecutive patients with thick skin underwent structured primary rhinoplasty without any additional maneuvers. In study group, thirty-one consecutive patients with thick skin underwent the same operation with an additional “External supratip suture (ESS).” Nineteen patients with moderate skin were also operated using the ESS to accentuate the supratip break and control the soft tissue response. Patients’ supratip regions were analyzed with reference to a tangent line from the tip defining point to the nasion. Two independent blinded plastic surgeons rated the supratip aesthetics on a 5-point scale.

**Results** The ESS maneuver had better results in the supratip region according to the two parameters which were statistically significant ( $p < 0.05$ ). No ischemic complications were observed.

**Conclusion** This simple and reliable external approach is a powerful maneuver which can be an effective technique not only in patients with thick skin, but also in moderate skin patients who requires better supratip definition. It enables surgeon to reduce the nasal volume efficiently in patients with noncompliant skin by controlling skin redraping by adhering to Auersvald’s hemostatic net principles. We believe that this approach will find a place in the armamentarium of rhinosurgeons.

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**Keywords** Rhinoplasty · Supratip break · Pollybeak deformity · Supratip · Supratip deformity · Thick skin

## Introduction

Supratip deformity, also known as the pollybeak deformity and defined as postsurgical convexity or fullness located just above the nasal tip, still accounts for one of the most common iatrogenic deformities requiring revision surgery in rhinoplasty [1–3]. This deformity can be the indication in up to 62% of all revision rhinoplasties [4, 5]. Guyuron et al. reported that the supratip deformity can be observed in as high as 9% of all primary rhinoplasties [6]. Therefore, many surgeons are unwilling to operate on patients with thick skin due to their unpredictable soft tissue response. Because of the fact that creating a desired tip definition is a demanding step requiring artistic skills in rhinoplasty, understanding of the mechanisms and prevention methods

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This article was updated to correct errors introduced to Figs. 5 and 10 after the author had reviewed proofs.

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of the supratip deformity is of paramount importance for achieving better results [7].

There are several factors contributing to this deformity such as inadequate tip projection, residual excessive caudal dorsum, inadequate cephalic resection of lower lateral cartilages, and supratip soft tissue excess [8]. Among the other factors, soft tissue response in the supratip area, dead space control, amount of fibrosis after the operation, and adaptation of the skin envelope to the underlying skeleton are the ones which are highly unpredictable especially in thick skin patients and the subjects of this study. Sheen noted that most of the patients with postoperative supratip deformity had soft tissue excess which is easily compressible with palpation [9].

The nasal skin envelope can be resistant to adaptation to the underlying structures, especially at the supratip region. This resistance and poor soft tissue healing can hamper achieving a good tip definition. In this study, we aimed to present a novel technique to prevent supratip deformity and increase the tip definition, especially in patients with thick skin.

## Patients and Methods

This study was conducted according to the guiding principles delineated in the declaration of Helsinki. Written informed consent was obtained from all patients. A total of eighty-three patients were included and underwent open structural primary rhinoplasty. Among them, sixty-four patients had thick nasal skin, while remaining nineteen patients had moderate skin. Patients' skin types were evaluated according to the Obagi skin pinch test [10], skin oiliness, the porosity of the nasal skin, and intraoperative skin consistency and its resistance to adaptation in the supratip region (Supplementary Video Content 1). Based on these parameters, patients were divided into the three groups: those with thick, moderate and thin skin. In the control group, thirty-three consecutive patients with thick skin underwent structured primary rhinoplasty without any additional maneuvers for the supratip region except taping. After the completion of the control group, thirty-one consecutive patients with thick skin underwent the same operation with an additional "External supratip suture (ESS)" in the study group. All operations were performed by the same surgeon (AK) between May 2018 and July 2020. Nineteen patients with moderate skin were also operated using the ESS to accentuate the supratip break and control the soft tissue response in the supratip region. Patients with thin skin were excluded from the study. Guyuron's internal supratip suture [6] was also used in several cases with thick skin after the completion of control and study groups in order to see its effectiveness in the

supratip region. Its possible disadvantages were also discussed and demonstrated.

We used septal extension grafts or tongue-in-groove technique for tip support. Autospreader flaps were used for dorsum reconstruction after the dorsal reduction. A slight supratip break was always present at the end of the operation which was confirmed by palpation intraoperatively (see Supplementary Video Content 1 and Figure 1a). After the removal of cast at the postoperative 1 week, an additional taping was applied for a period of 1 week. No corticosteroid injections were performed in any patients.

Patients' demographic data were recorded. Average follow-up was 14 months (range, 12–17 months). The average age of the patients was 25.6 years (range, 17–36 years). There were 26 females and 7 males in the control group, whereas 25 females and 6 males in the study group. The age and sex distribution of the groups was statistically similar ( $p > 0.05$ ). Their supratip fullness was analyzed with reference to a tangent line from the tip defining point to the nasion. Patients were classified into three groups based on this line as having a supratip fullness above the line (numbered as 3), on the line (numbered as 2), and below the line (numbered as 1) (Figure 1b). Additionally, patients' supratip region was evaluated by two independent plastic surgeons blinded to the procedures on a 5-point scale. These parameters were analyzed using Mann–Whitney U test.  $P$ -values  $< 0.05$  were considered statistically significant. All measurements and assessments were taken on postoperative digital photographs taken at the last follow-up of the patients (average, 14 months; range, 12–17 months).

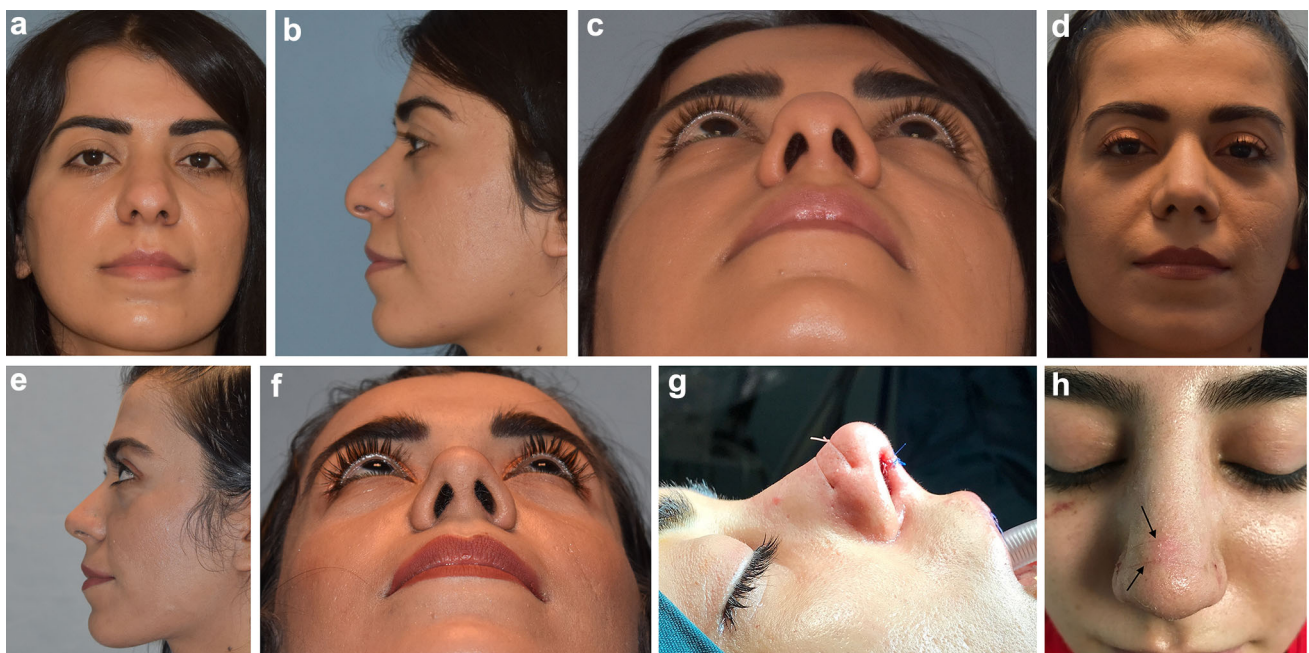
## Technique

Following completion of the surgery, if any skin resistance to adaptation to the underlying structures in the supratip region was felt by palpation, we used an ESS to close the dead space in the supratip region and form a barrier against postoperative swelling which might end up as fibrosis causing unwanted convexity. This external suture passes from the scroll region of one side and extends to the contralateral scroll region in a horizontal mattress suture fashion, compressing the supratip skin. A 5-0 polypropylene suture is used for that purpose. It goes into the nasal cavity and exits the skin taking a full-thickness bite of the nasal tissue, and the same maneuvers are performed at the contralateral site; then, the suture is knotted. It should not be so tight that it might cause skin necrosis and should exert a gentle pressure on the supratip and scroll regions. This maneuver creates a bolster effect on the underlying structures. It is removed along with the external splint after 1 week. The ESS also acts as a flaring suture supporting the internal nasal valve as an external splint for a period of 1



**Fig. 1** **a** A slight supratip break was always present at the end of the operation which was confirmed by palpation intraoperatively. **b** A 21-year-old female patient with postoperative supratip fullness 13 months after rhinoplasty. Evaluation of the supratip region with reference to a tangent line from the tip defining point to the nasion.

The external supratip suture was not used in this patient. Note the supratip fullness above the line from the tip defining point to the nasion 13 months after the operation despite the intraoperative presence of a supratip break (a)



**Fig. 2** Preoperative (a, b, c) and 12 months postoperative (d, e, f) images of a 24-year-old female patient with thick skin. **g.** Intraoperative lateral view of the external supratip suture (ESS). **h.** Anterior

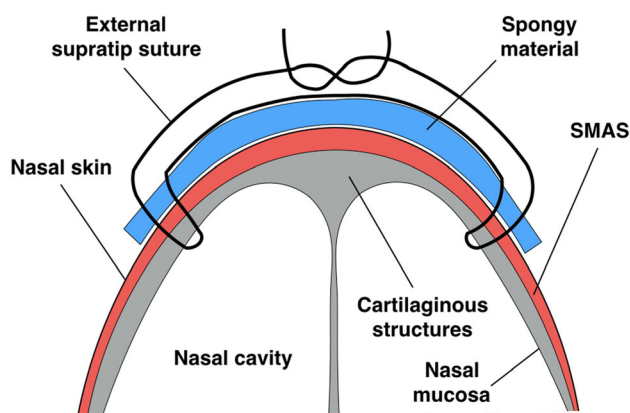
view of the patient after the removal of the ESS and cast after 7 days postoperatively. The ESS can rarely leave marks on the skin (arrows) which disappears after 3 to 4 weeks

week. After several cases, we observed that the ESS can rarely leave marks on the skin which disappears after 3 to 4 weeks (Figure 2); therefore, we revised the technique and placed a spongy material under the suture to distribute the

pressure on skin (Figures 3 and 4). We recommend closing the ESS on a soft or spongy material to better distribute the pressure on the skin to prevent a cheesewire effect or possible skin necrosis.

## Results

The ESS maneuver group had the better results in the supratip region according to the two parameters, which were statistically significant (Table 1). Owing to the strong tip support maneuvers, no rotational loss was observed postoperatively which was verified by overlapping patients' follow-up images. All supratip deformities observed in those patients had soft tissue characteristics which was verified by palpation at the final follow-up. No ischemic complications were observed in patients.



**Fig. 3** The external supratip suture

In patients with moderate nasal skin, the ESS increases the supratip definition, thereby increasing the skin adaptation to the underlying structures, and controlling the dead space and edema formation. In these patients, the supratip definition can be observed as soon as the ESS and cast are removed at the postoperative 1 week (Figure 5).

**Table 1** Evaluation of the supratip region in the control and study groups

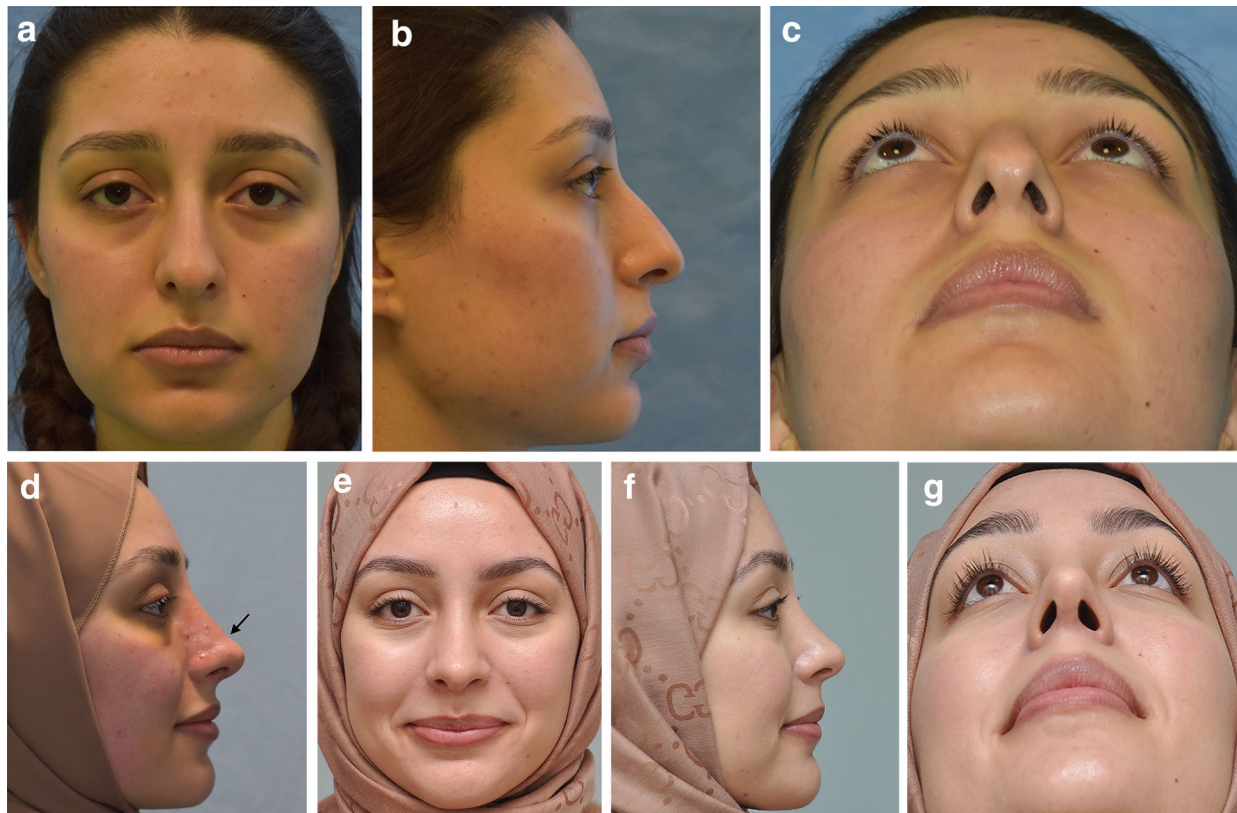
	Group	N	Average score	Standard deviation	<i>p</i>
Evaluation of the supratip with reference to the line (1= no/little edema, 2= moderate edema, 3= supratip fullness)	Control	33	2.09	0.46	
	Study	31	1.74	0.45	0.004*
Evaluation of the supratip by two independent plastic surgeons (1= very poor, 2= poor, 3= average, 4= good, 5= excellent)	Control	33	4.36	1.11	0.003*
	Study	31	4.92	0.28	

\**p* < 0.05



**Fig. 4** Preoperative (a, b, c) and 12 months postoperative (d, e, f) images of a 20-year-old female patient with thick skin. **g.** Intraoperative view of the external supratip suture with a spongy material placed under the suture to distribute the pressure on skin. This suture

passes from the scroll region of one side and extends to the contralateral scroll region in a horizontal mattress suture fashion. The two lines of the horizontal mattress suture might overlap over the spongy material as seen in this figure



**Fig. 5** Preoperative (a, b, c), 1 week postoperative (d) and 16 months postoperative (e, f, g) images of a 21-year-old female patient with moderate skin. The external supratip suture was utilized at the

supratip region to accentuate the supratip definition. Note the effect of the external supratip suture at 1 week postoperatively (arrow)

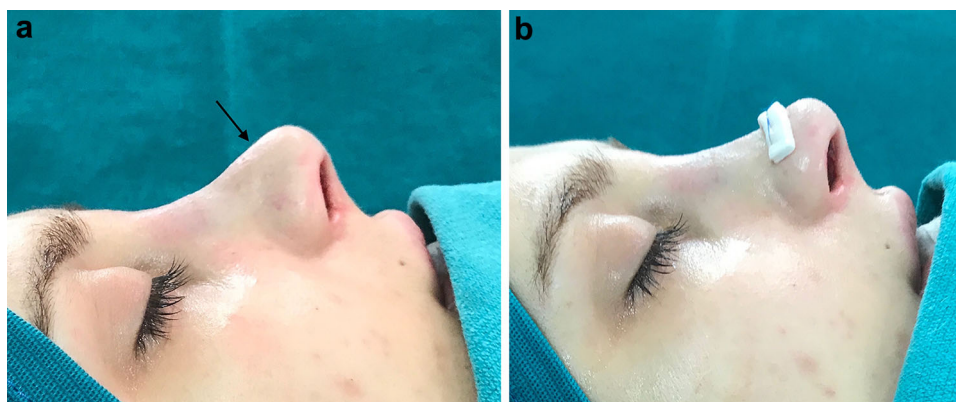
After the completion of control and study groups, we also used the internal supratip fixation suture in several patients with thick skin to see its effect on the supratip skin [6]. As it was pointed out by Guyuron in the original description of the method, we also realized that if it passes too close to the skin, it creates a dimple in the middle and two skin bulges on the supratip sidewalls, especially in thick skin patients with poor skin adaptation (Figure 6) [6]. Moreover, it is also possible with this suture to have a poor dead space control (Supplementary Video Content 2) and a supratip fullness postoperatively; therefore, it should be executed carefully.

## Discussion

Management of the patients with thick skin has always been debated in rhinoplasty [10–13]. Medical skin treatments are promising. Isotretinoin can be used to decrease sebaceous gland activity and thin the nasal skin-



**Fig. 6** The internal supratip fixation suture described by Guyuron<sup>6</sup> might create a dimple in the middle (blue arrows) and two skin bulges on the supratip sidewalls (red arrows), especially in thick skin patients with poor skin adaptation



**Fig. 7** Even in patients with moderate skin, management of the supratip might be troubling as the supratip skin can be inelastic and tend to stay bulbous intraoperatively. a Intraoperative lateral view of a 24-year-old female patient with a noncompliant supratip skin (arrow)

subcutaneous tissue envelope for better skin adaptation [14, 15]. Corticosteroid injections can also be used as a salvage procedure in patients with supratip fullness, but their long-term effects are controversial [16, 17]. These treatments should be used with caution owing to their adverse effects and cost.

Several surgical maneuvers have been described to increase the tip definition in thick skin patients. It is now believed that SMAS excision and skin stretching are two effective strategies in patients with thick skin [12]. However, enlargement of the underlying nasal framework to stretch the skin might not be cosmetically acceptable as these patients mostly desire a petit nose. Excision of the SMAS is an effective maneuver in patients with bulbous tip and can increase the tip definition. However, the supratip skin often resists against adaptation to the underlying framework despite the SMAS excision, as this skin is mostly inelastic and noncompliant. Additionally, this excision might increase the scarring and compromise skin vascularity and therefore should be performed carefully. Even in moderate skin patients, management of the supratip might be troubling as the supratip skin can be inelastic and tend to stay bulbous (Figure 7). Guyuron described a powerful maneuver with an internal supratip suture to increase the supratip definition and close the dead space [6]. However, it should be used judiciously because it can cause unfavorable outcomes as it might be insufficient in achieving good supratip definition as we mentioned in results section (see Supplementary Video Content 2). Preservation or repair of the Pitanguy ligament is another technique gaining popularity recently [18–20]. In patients with thick skin, the SMAS layer involving the Pitanguy ligament might be edematous in the supratip region postoperatively even though the ligament is preserved. This might cause permanent fibrosis in that area. Additionally,

which might cause a supratip deformity postoperatively. b Management of the noncompliant supratip skin with an external supratip suture. As seen in this photograph, the two lines of the horizontal mattress suture might overlap over the spongy material (see Figure 3)

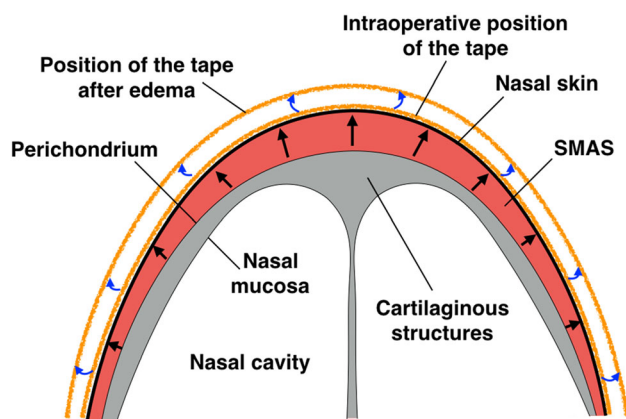
after the dorsal reduction it might be necessary to cut this ligament as it might prevent skin adaptation as the new position of the Pitanguy ligament might have changed. Therefore, we wanted to increase the control of the supratip region in these patients and utilize the ESS which not only prevents the swelling and distention in the supratip region but also increases the skin redraping and adaptation with a similar fashion to the hemostatic net described by Auersvald et al [21, 22]. We wanted to increase the tip definition and skin adaptation using the same hemostatic net principles in rhinoplasty.

In this technique, it is crucial to assess the supratip skin resistance by palpation intraoperatively after the completion of the surgery. Whenever an adaptation problem is felt, which can be described as skin bulging despite the underlying dead space in the supratip region, the ESS should be used to increase the definition and skin adaptation. Otherwise, this dead space is prone to accumulation of blood or seroma which can cause supratip fullness. In fact, we begin to use this technique in every patient with thick skin as a prophylactic maneuver and in moderate skin patients desiring a supratip break. In patients with thin skin, this maneuver is unnecessary as the skin adapts to the underlying framework properly.

Direct skin excision from the supratip region [11], use of a reverse nasal SMAS-perichondrium flap [23], and a small cartilaginous modification at the anterior septal angle to prevent the supratip deformity are other techniques published in the literature. However, in our opinion, external control of the supratip results in better outcomes as it eliminates the risk of unpredictable soft-tissue healing responses.

Postoperative taping is another subject that most surgeons rely on to control soft tissue response. Postoperative taping might last several weeks or even months to

adequately shape the postoperative swelling but often results in poor outcomes. It is obvious that a poorly executed rhinoplasty cannot be effectively compensated by postoperative taping. Tapes usually cannot resist against the postoperative swelling (Figure 8). Moreover, the cast only applies pressure on the sidewalls. Therefore, it is likely to observe a supratip edema postoperatively in patients with thick skin that might be irreversible due to the persistent fibrosis which can ruin the cosmetic outcome. For that reason, the ESS is a powerful maneuver to control the soft tissue response. It not only improves the supratip aesthetics but also controls the scroll region increasing the



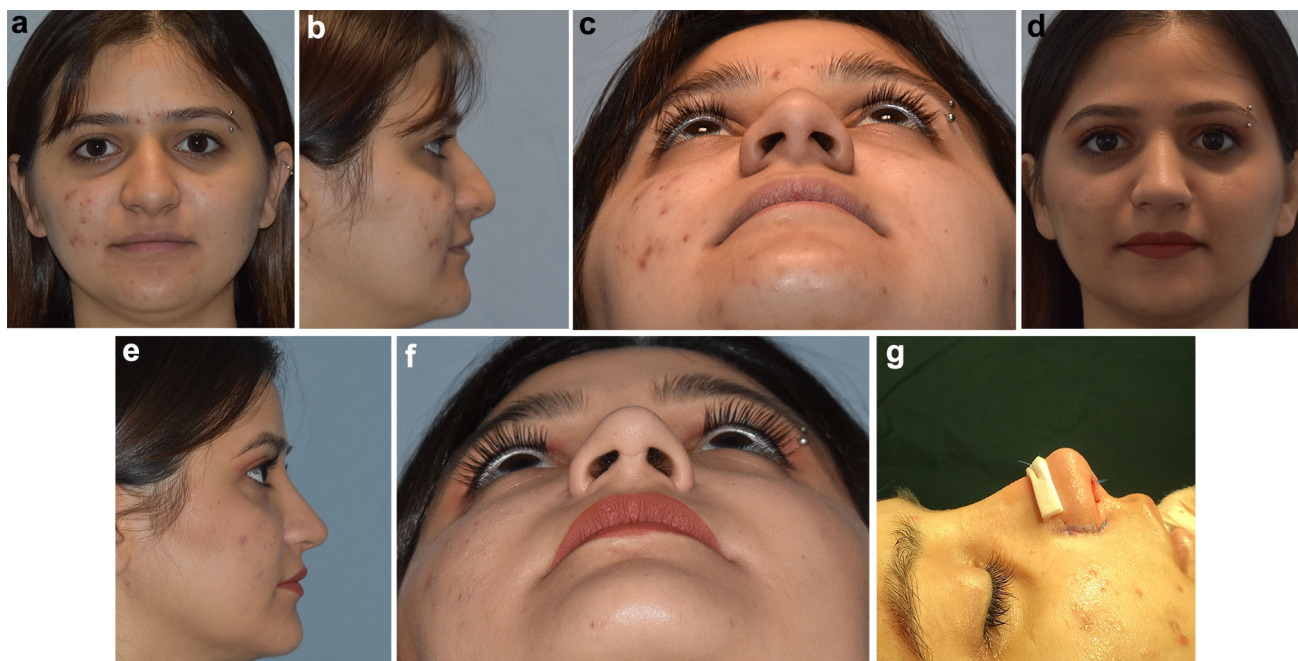
**Fig. 8** Tapes usually cannot resist against the postoperative swelling in rhinoplasty. Their position changes after the swelling

definition of the alar crease as it closes the dead space of that region as well. The simplicity of that maneuver might obviate the need to repair the scroll and Pitanguy ligaments internally which are suggested recently to increase the tip definition [19–24].

It should also be noted that the ESS also supports the internal nasal valve with a flaring effect. It acts as an external splint for the internal nasal valve for a period of 1 week. This minor effect might improve the functional results of the surgery, but further clinical studies are needed to support this hypothesis.

In the current study, we did not focus on the cartilaginous supratip deformity as it has different etiologies and prevention strategies. Using the ESS would be a futile maneuver if the tip projection is lost or the dorsum is inadequately resected. It is clear that if adequate tip support can be provided by powerful techniques such as septal extension grafts or tongue-in-groove technique, rotational loss is very unlikely in the postoperative period [25]. Additionally, sufficient amount of dorsal cartilaginous resection can be controlled by palpation intraoperatively.

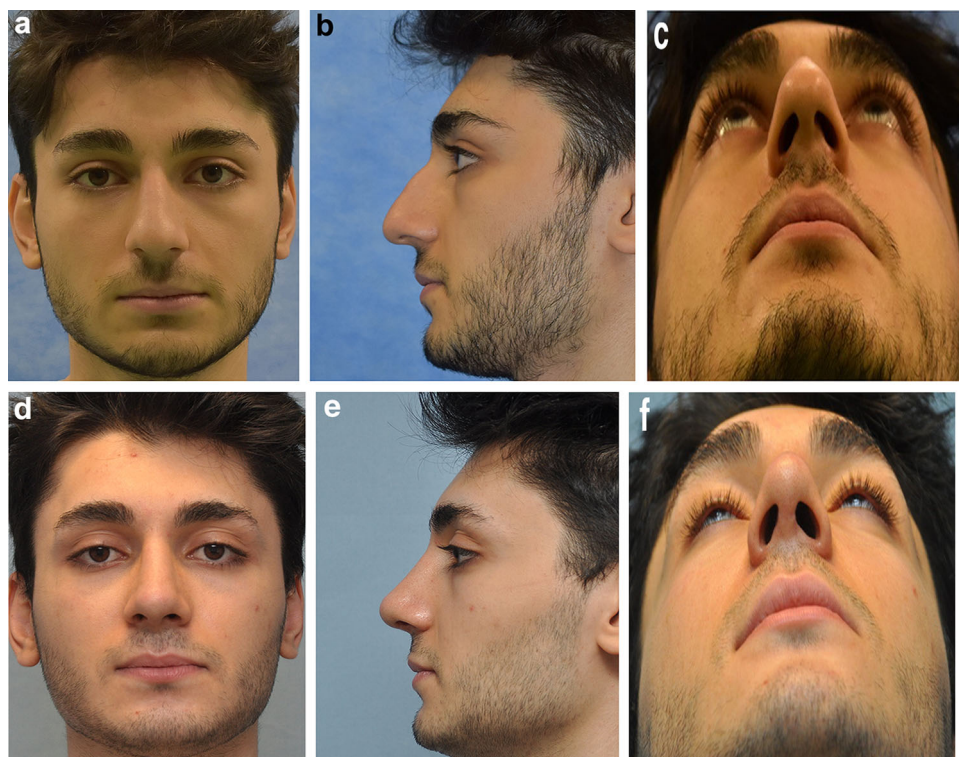
Another point worth emphasizing is that the supratip break is not essential in rhinoplasty, especially in thick skin patients (Figure 9) and male patients (Figure 10). However, the ESS should be considered as an effective prophylactic maneuver for prevention of the supratip deformity in these patients. This technique can be considered as a powerful maneuver in patients with highly unpredictable soft-tissue



**Fig. 9** Preoperative (a, b, c) and 12 months postoperative (d, e, f) images of a 21-year-old female patient with thick skin **g**. The external supratip suture was utilized at the supratip region. As seen in this

photograph, the two lines of the horizontal mattress suture might overlap over the spongy material (see Figure 3)

**Fig. 10** Preoperative (a, b, c) and 14 months postoperative (d, e, f) images of a 24-year-old male patient with thick skin. The external supratip suture was utilized at the supratip region



healing characteristics such as oily, porous, and ultrathick skin. It can also be used as a routine maneuver to accentuate the supratip break in patients with moderate skin (see Figure 5). Moreover, it enhances the skin adaptation and redraping by increasing surgeon's ability to reduce the nasal framework (Supplementary Figure Content 3) which is hard to achieve with conservative techniques in patients with thick skin.

Several limitations of this study need to be discussed. First, the study and control groups were consisted of patients with thick skin. However, the moderate skin group and the internal supratip fixation suture group did not have any control groups. Therefore, our results were solely based on patients' follow-up findings and our observations in these groups. Second, this study focuses on the supratip deformity caused by excessive soft tissue response. However, loss of tip support and residual excessive caudal dorsum are other common causes of the supratip deformity, which are beyond the scope of this study. Third, we did not include patients over 40 years of age, who usually have low skin quality and decreased skin elasticity, in this study. However, we advise the use of this technique in older patients with moderate or thick skin as the ESS relies on the same principle with the gliding brow lift concept which includes the use of Auersvald's hemostatic net for skin redraping in older patients with brow ptosis [22].

## Conclusion

Supratip deformity has been reported as the cause of up to 62% of all revision rhinoplasties [4, 5]. Rhinosurgeons have been plagued with the unpredictable soft tissue response of the supratip region in patients with inelastic and noncompliant skin. The simple and reliable external approach presented here is a very powerful maneuver which can be a routine step not only in patients with thick skin, but also in moderate skin patients who desire a better supratip definition. Moreover, it enables us to reduce the nasal volume efficiently in patients with noncompliant skin by controlling the skin adaptation and redraping by adhering to Auersvald's hemostatic net principles [21, 22]. We believe that this technique will find a place in the armamentarium of rhinosurgeons who want to have a better control over the supratip region.

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## Declarations

**Conflict of interest** The authors declare that they have no conflicts of interest to disclose.



**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

**Informed Consent** Written informed consent was obtained from all patients for the procedures performed and for the use of their images.

## References

- Parkes ML, Kanodia R, Machida BK (1992) Revision rhinoplasty. An analysis of aesthetic deformities. *Arch Otolaryngol Head Neck Surg* 118:695–701
- Foda HM (2005) Rhinoplasty for the multiply revised nose. *Am J Otolaryngol* 26:28–34
- Tardy ME Jr, Kron TK, Younger R, Key M (1989) The cartilaginous pollybeak: etiology, prevention, and treatment. *Facial Plast Surg* 6:113–120
- Slupchynskij O, Rahimi M (2014) Revision rhinoplasty in ethnic patients: pollybeak deformity and persistent bulbous tip. *Facial Plast Surg* 30:477–483
- Hussein WKA, Foda HMT (2016) Pollybeak deformity in middle eastern rhinoplasty: prevention and treatment. *Facial Plast Surg* 32:398–401
- Guyuron B, DeLuca L, Lash R (2000) Supratip deformity: a closer look. *Plast Reconstr Surg* 105:1140–1151
- Cakir B, Oreroglu AR, Daniel RK (2014) Surface Aesthetics in Tip rhinoplasty: a step-by-step guide. *Aesthet Surg J* 34:941–955
- Kim SK, Kim JC, Lee KC, Kim HS (2012) Correction of the Supratip deformity of the nose. *Aesthetic Surg J* 32:943–955
- Sheen JH (1979) A new look at supratip deformity. *Ann Plast Surg* 3:498–504
- Kosins AM, Obagi ZE (2017) Managing the difficult soft tissue envelope in facial and rhinoplasty surgery. *Aesthetic Surg J* 37:143–157
- Hoehne J, Brandstetter M, Gubisch W, Haack S (2019) How to reduce the probability of a pollybeak deformity in primary rhinoplasty: a single-center experience. *Plast Reconstr Surg* 143:1620–1624
- Guyuron B, Lee M (2017) An effective algorithm for management of noses with thick skin. *Aesthetic Plast Surg* 41:381–387
- Cobo R, Camacho JG, Orrego J (2018) Integrated management of the thick-skinned rhinoplasty patient. *Facial Plast Surg* 34:3–8
- Sazgar AA, Majlesi A, Shoostari S, Sadeghi M, Sazgar AK, Amali A (2019) Oral isotretinoin in the treatment of postoperative edema in thick-skinned rhinoplasty: a randomized placebo-controlled clinical trial. *Aesthetic Plast Surg* 43:189–195
- Cobo R, Vitery L (2016) Isotretinoin use in thick-skinned rhinoplasty patients. *Facial Plast Surg* 32:656–661
- Pulikkottil BJ, Dauwe P, Daniali L, Rohrich RJ (2013) Corticosteroid use in cosmetic plastic surgery. *Plast Reconstr Surg* 132:352e–360e
- Saedi B, Amali A, Arabpor M (2017) Comparison of two concentrations of triamcinolone injection in the prevention of supratip edema after external rhinoplasty: a randomized trial. *Am J Rhinol Allergy* 31:412–415
- Pitanguy I (1965) Surgical importance of a dermocarilaginous ligament in bulbous noses. *Plast Reconstr Surg* 36:247–253
- Daniel RK, Palhazi P (2018) The Nasal Ligaments and Tip Support in Rhinoplasty: an anatomical study. *Aesthet Surg J* 38:357–368
- Cakir B, Oreroglu AR, Dogan T, Akan M (2012) A complete subperichondrial dissection technique for rhinoplasty with management of the nasal ligaments. *Aesthetic Surg J* 32:564–574
- Auersvald A, Auersvald LA (2014) Hemostatic net in rhytidoplasty: an efficient and safe method for preventing Hematoma in 405 consecutive patients. *Aesthetic Plast Surg* 38:1–9
- Viterbo F, Auersvald A, O'Daniel TG (2019) Gliding Brow Lift (GBL): a new concept. *Aesthetic Plast Surg* 43:1536–1546
- Arslan E, Gencil E, Pekedis O (2012) Reverse nasal SMAS-perichondrium flap to avoid supratip deformity in rhinoplasty. *Aesthetic Plast Surg* 36:271–277
- Bitik O, Uzun H, Konas E (2019) Scroll reconstruction: fine tuning of the interface between middle and lower thirds in rhinoplasty. *Aesthetic Surg J* 39:481–494
- Rohrich RJ, Durand PD, Dayan E (2020) Changing role of septal extension versus columellar grafts in modern rhinoplasty. *Plast Reconstr Surg* 145:E927–E931

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