

# Pollybeak deformity in rhinoplasty: prevention and treatment

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**Abstract. – OBJECTIVE:** Patients with pollybeak deformity who underwent rhinoplasty were analyzed retrospectively and across centers to identify their primary risk factors, preventative measures, and treatment modalities.

**PATIENTS AND METHODS:** The retrospective data of 100 pollybeak deformity cases (61 males and 39 females) were enrolled in our study. The causes leading to pollybeak deformity were evaluated and classified as (1) Over-resected bony dorsum, (2) Excessive supra tip scarring, and (3) Inefficient tip support causing an under-projected tip. The treatments applied to patients with pollybeak deformity were retrospectively evaluated and classified as (1) Triamcinolone acetonide injections (one or two injections), (2) Filler injection over the bony dorsum to balance, (3) Using a graft to achieve the desired nose shape, (4) Trimming down the excessive supra tip soft tissue and/or tip cartilage, and (5) Enforcing the tip support.

**RESULTS:** Our results showed that the major cause of pollybeak deformity was excessive supra-tip scarring (48%). The other reasons are inefficient tip support, causing an under-projected tip (28%), and over-resected bony dorsum (24%). The modalities for the treatment of pollybeak deformity were (1) Trimming down the excessive supra tip soft tissue and/or tip cartilage (30%), (2) Triamcinolone acetonide injections (one or two injections) (28%), or (3) Enforcing the tip support (28%), (4) Using a graft to achieve the desired nose shape (14%) and (5) Filler injection over the bony dorsum to balance (6%). In some patients, more than one treatment modality was applied. Triamcinolone acetonide or filler injections were the non-surgical therapies for pollybeak deformities.

**CONCLUSIONS:** We concluded that excessive supra-tip scarring is not directly related to a surgical error but rather depends on the patient and tissue healing. Care should be taken to avoid over-resecting the bony dorsum. Tip support should be provided to prevent inefficient tip support from causing an under-projected tip. However, efforts should be made to minimize su-

pra-tip dead space and possibly proceeding pollybeak formation through proper bandaging.

*Key Words:*

Pollybeak deformity, Rhinoplasty, Cause, Prevention, Treatment.

## Introduction

Revision rhinoplasty is often required due to the presence of a pollybeak deformity. Certain nose features common in Middle Eastern populations increase the likelihood of developing a pollybeak<sup>1</sup>. With prevalence rates as high as 9 percent after primary rhinoplasty and in 36% of the secondary rhinoplasties<sup>2</sup>, the “pollybeak deformity”, also known as “supra-tip deformity” and characterized as “excessive supra-tip fullness”, is one of the most prevalent abnormalities following rhinoplasty. A pollybeak deformity was present in 62% of a cohort of 1,160 Middle Eastern patients undergoing revision surgery over an 11-year period<sup>1</sup>, according to a study<sup>3</sup> published recently. A pollybeak deformity is highly stigmatizing and should be avoided at all costs during rhinoplasty.

An “over projected caudal dorsum,” “an under projected tip,” a combination of these factors, or “cephalically oriented lower lateral cartilages” are the usual culprits in primary rhinoplasties. Over resection of the caudal nasal dorsum, inadequate excision of the dorsal cartilaginous septum, insufficient resection of the cephalic region of the lower lateral cartilages, and insufficient tip projection are the leading causes of this complication in revision rhinoplasties<sup>1,2</sup>.

“Over-resected bony dorsum,” “inadequate lowering of anterior septal angle,” thick skin with extensive scarring, and an under-projected

tip with weak support are the most typical causes of pollybeak<sup>2,4</sup>. Extreme weight loss and skin excision have a high risk of developing irreversible consequences, including atrophy and necrosis. Wright<sup>5</sup> and Nemati et al<sup>6</sup> demonstrated that pollybeak development was not prevented by defatting the skin.

Possible pollybeak symptoms include an under-projected tip. It is possible that the dorsal profile can be made more harmonious by simply projecting the tip. Combining reduction and augmentation could be the most effective therapy option. Preoperative planning is essential for successful surgical outcomes. Even the most skilled surgeons in the operating room cannot fix a botched operation. It is important for the surgeon and patient to have shared goals, and preoperative imaging can help with that<sup>7</sup>.

In this study, we looked into the most common factors that lead to pollybeak deformity, as well as ways to avoid and manage it.

## Patients and Methods

This retrospective and multicentric study was conducted in the Otolaryngology Departments of Eskişehir Osmangazi University, Kırıkkale University, and Ankara Bilkent City Hospital; and Dr. Oğuzhan Oğuz Wellnose Clinic according to the rules outlined in the Declaration of Helsinki. Ethics Committee approval was obtained by T.R. Ministry of Health, City Health Directorate, Ankara Bilkent City Hospital, Presidency of No. 1 Clinical Research Ethics Committee (Date: 21.06.2023, Number: E-Kurul-E1-23-3749). Informed consent was not needed as the data were evaluated retrospectively.

### Subjects

The analysis included 100 patients (61 males and 39 females) who underwent rhinoplasty between 2017 and 2022. These patients were followed up with their physicians after a full year and subsequently reported concerns regarding pollybeak deformity. Patients were chosen from those who had submitted applications to the Otolaryngology clinics at Eskişehir Osmangazi University, Ankara Bilkent City Hospital, and the Dr. Oğuzhan Oğuz Wellnose Clinic. After having surgery at one of the research centers, 50 of the patients acquired pollybeak deformities. The remaining 50 patients had their rhinoplasty procedures performed at

centers other than those listed. They went to one of three clinics for the treatment of pollybeak deformity. The mean ages of the patients were  $32.67 \pm 6.55$  (ranging from 18 to 46).

### Inclusion Criteria

- Development of pollybeak deformity after rhinoplasty surgery in the past 5 years,
- Adult patients  $\geq 18$  years old,
- At least 1 year since the initial rhinoplasty operation.

### Exclusion Criteria

Patients who did not come for postoperative follow-up were not included in the study.

### Methods

The causes leading to pollybeak deformity were evaluated and classified:

- Over-resected bony dorsum
- Excessive supra-tip scarring
- Inefficient tip support causing an under-projected tip
- The treatments applied to patients with pollybeak deformity were retrospectively evaluated and classified:
- Triamcinolone acetonide injections (Kenakort®, 40 mg/mL, Abbott, Istanbul, Turkey) (one or two injections),
- Filler injection over the bony dorsum to balance,
- Using a graft to achieve the desired nose shape,
- Trimming down the excessive supra-tip soft tissue and/or tip cartilage,
- Enforcing the tip support.

### Statistical Analysis

The data collected in this study were analyzed using the SPSS for Windows 16.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics (Mean, standard deviation, minimum, maximum, and defining the quartiles) were applied.

A value of  $p < 0.05$  was considered statistically significant.

## Results

In this retrospective study, there were 100 patients with pollybeak deformity. 61 of them were males, and 39 of them were females.

Our results showed that the causes leading to pollybeak deformity were as follows:

- Over-resected bony dorsum: 24%,
- Excessive supra-tip scarring: 48%,
- Inefficient tip support causing an under-projected tip: 28%.

The treatments applied to patients with pollybeak deformity were retrospectively evaluated and classified. In some patients, more than one treatment modality was applied (Figures 1A-B, 2A-B, 3A-B):

- Triamcinolone acetonide injections (one or two injections): 28%,
- Filler injection over the bony dorsum to balance: 6%,
- Using a graft to achieve the desired nose shape: 14%,
- Trimming down the excessive supra tip soft tissue and/or tip cartilage: 30%,
- Enforcing the tip support: 28%.

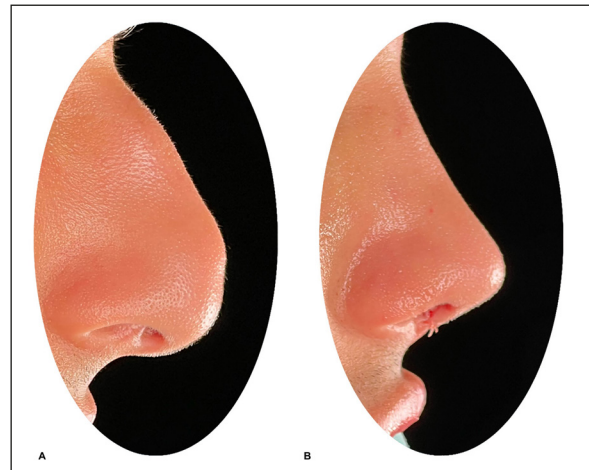
### Discussion

Over-projection of the caudal dorsum and under-projection of the nasal tip are the most common causes of the pollybeak deformity, though “cephalically oriented or inadequately cephalically resected lower lateral cartilages”, “excessive supra-tip scarring”, or “a high anterior septal angle” are also contributors<sup>1,2</sup>. Many authors<sup>8,9</sup> have noted that Middle Eastern patients are more likely to acquire a pollybeak deformity following rhinoplasties than patients from other ethnic backgrounds. This is likely due to the prevalence of heavy, thick skin in the region. Patients with thick skin are more likely to develop a pollybeak deformity because excess skin accumulates in the

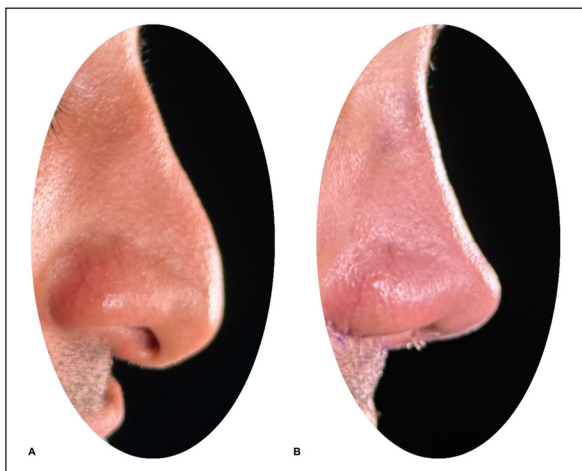
supra-tip area and does not compress adequately following cartilaginous framework reduction<sup>3</sup>.

Pollybeak deformity may develop as a result of “keloid formation in the internal tissues” of Middle Eastern individuals, who have a higher predisposition toward hypertrophic scarring and keloid formation. Triamcinolone injections into the supra-tip region have been shown<sup>10</sup> to reduce collagen synthesis and scar formation by dampening the inflammatory response and blocking fibroblastic activity.

One hundred people were surveyed for this study on their experiences with pollybeak deformity. Excessive supra-tip scarring was found to be the leading cause of pollybeak deformity (48%). Under-projected tips (28%) and



**Figure 1.** Case 1: (A) Pollybeak deformity on the right side, (B) After treatment on the left side.



**Figure 2.** Case 2: (A) Pollybeak deformity on the right side, (B) After treatment on the left side.



**Figure 3.** Case 3: (A) Pollybeak deformity on the right side, (B) After treatment on the left side.

over-resected bony dorsum (24%), on the other hand, are due to poor tip support.

Our study<sup>11</sup> found that trimming down the supra-tip soft tissue and/or tip cartilage (30%) was the most common treatment modality for pollybeak deformity, followed by Triamcinolone acetonide injections (one or two injections, 28%), reinforcing the tip support (28%), grafting to achieve the desired nose shape (14%), and filler injection over the bony dorsum for balance (6%). The pollybeak abnormalities were treated non-surgically with triamcinolone acetonide injections or filler injections.

Primary rhinoplasty should be performed without creating a Pollybeak deformity, according to Hoehne et al<sup>3</sup>. This is especially important for patients with thick nose skin. They proposed two surgical procedures to lower the disease's prevalence in high-risk patients<sup>3</sup>. For extremely unusual instances with substantial skin excess, instead of excision of excessive skin, a modification of the supra-tip suture originally reported by Guyuron et al<sup>2</sup> and Guyuron and Lee<sup>12</sup> should be preferred.

Pollybeak deformities can also occur following considerable nasal tip rotation in people with thicker skin. A pollybeak forms when the tip rotates, bunching the soft tissue underneath it until the skin is removed. The technique of supra-tip skin removal and access to the tip structures for rhinoplasty is described by Ozturan et al<sup>13</sup>. Isotretinoin preoperatively, "intraoperative excision of fat," and "superficial musculoaponeurotic system (SMAS) in the supra-tip", "placement of a tacking suture to better appose the skin to the cartilage", "postoperative injection of steroids", and "postoperative taping"<sup>7,12,14,15</sup> are other methods for dealing with a thick soft-tissue envelope.

Pollybeaks can also be caused by lateral crura positioned too high on the head. If the lateral crura overrides the dorsum, it can cause a persistent excess of volume in the supra-tip. If the lateral crura are shifted laterally, the extra volume is transferred from the supra-tip to the lateral nasal wall, eliminating the pollybeak. It is possible to relocate with or without lateral crural strut grafts<sup>7,16</sup>.

The heavy, thick skin envelope, the over-projecting osseocartilaginous vault, the weak, poorly supported alar cartilages, and the short middle and medial crura are all physical features that contribute to pollybeak deformity in Middle Eastern noses. Middle Eastern noses tend to have thicker skin, which might have a negative impact on the final result of a rhinoplasty. This skin type has a thicker dermis, larger than average

cutaneous pores, a substantial subcutaneous fat pad, and abundant sebaceous glands. Pollybeak deformity results from an accumulation of thick skin in the supra-tip region. The urge to aggressively reduce the bony-cartilaginous framework of a thick-skinned nose to generate maximum alteration in soft-tissue nasal contour is understandable. Since these rigorous actions weaken the nasal skeleton, it eventually gives way to the pressure of the scar and collapses<sup>8,9,17-22</sup>.

A pollybeak is a convexity of cartilage in the supra-tip region. This can occur as a result of a poorly supported nasal base or due to sloppy preparation of the dorsal excision. As the nose heals, the patient may see a reduction in tip projection if they have short medial crura. When this occurs, the lower lateral cartilages might shift toward the lip, giving the appearance of a heightened anterior septal angle. As a result, a supra-tip fracture may become a pollybeak. The widest part of the columella is at the base, making the short medial crura evident. During the rhinoplasty procedure, these individuals will require some tip support<sup>23,24</sup>. Tip support can be maintained using a columellar strut, but further stability can be achieved by attaching "the medial crura to the caudal septum" or using "a caudal septal extension graft"<sup>7,25</sup>.

Using retrospective data could increase the possibility of information loss in the data, which is a limitation of our study.

## Conclusions

Based on our research findings, we concluded that the patient's tissues and the inherent tissue healing capacity play a more significant role than the surgeon in the development of extensive supra-tip scarring. Over-resection of the bony dorsum should be avoided at all costs. An under-projected tip can be avoided by providing adequate support for the tip. However, efforts should be made to minimize supra-tip dead space and possibly proceeding pollybeak formation through proper bandaging.

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### Conflict of Interest

All authors declare no conflict of interest.



### Ethics Approval

Ethics Committee approval was obtained by the T.R. Ministry of Health, City Health Directorate, Ankara Bilkent City Hospital, Presidency of No. 1 Clinical Research Ethics Committee (Date: 21.06.2023, Number: E-Kurul-E1-23-3749). The study was conducted in accordance with the Helsinki Declaration and its latest amendments.

### Informed Consent

Informed consent requirement was waived due to the retrospective design of the study.

### Authors' Contributions

Oğuzhan Oğuz MD: Planning, designing, literature survey, data collection, active intellectual support. Kazım Bozdemir: Planning, designing, literature survey, data collection, active intellectual support. Nuray Bayar Muluk: Planning, designing, literature survey, statistical analysis, writing, active intellectual support, submission. Cemal Cingi: Planning, designing, literature survey, data collection, active intellectual support, English editing.

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### Availability of Data and Materials

All data of this paper are presented in the manuscript.

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