

Pollybeak deformity: how to avoid, how to cure

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Abstract. – We reviewed the Pollybeak deformity from prevention to treatment in all aspects. Research methods included searching online databases such as Google, Google Scholar, PubMed, and Proquest Central at King Saud University. We used terms like “Pollybeak deformity”, “rhinoplasty”, “etiology”, and “treatment” to find related articles. Pollybeak deformity, an undesirable side effect of rhinoplasty, manifests as a dorsal nasal convexity resembling a parrot’s beak. A dorsal hump that develops in the supratip region of the nose “pushes” the tip down, leading to under-rotation. Several factors may be at play here. When a surgeon fails to recognize the aberrant tip-supratip relationship that distinguishes this abnormality during the intraoperative evaluation of the nose, the result is a pollybeak. There is also the risk of pollybeak deformity, which the surgeon might be unable to predict. Supratip scar tissue is more common in people with thick skin and soft tissue envelopes. Medical intervention is only effective for soft-tissue pollybeaks when caught early. Injecting corticosteroids into the supratip dead space can alleviate edema and slow scar tissue formation. Surgical excision of scar tissue from the dorsum of the nose can repair the pollybeak deformity. Surgical correction of a supratip fullness that causes a disparity between the tip and supratip is known as a “pollybeak deformity”. The appearance of the nose in some individuals with pollybeak deformity can resemble that of a bird, which can cause them to feel self-conscious and embarrassed. Therefore, treatment with medicine or surgery is required for these ailments.

Key Words:

Pollybeak deformity, Rhinoplasty, Etiology, Treatment.

Introduction

During surgery, local anesthesia and edema hide the complicated three-dimensional geometry of the nose dorsum. This complicates the task of determining the true extent of the surgical improvements. Inadequate or excessive augmentation, an open-roof deformity, pollybeak, saddle

nose, inverted-V, warped cartilage, visible grafts, contour issues, graft malposition, and extrusion are all possible outcomes of dorsal modification¹.

Patients with a deformity known as pollybeak may struggle with insecurity due to their bird-like noses. Many patients say that their nose was enormously swollen following surgery and that they recognized the abnormality after the swelling reduced. Patients with loss of tip support report that their nose seems normal initially but develops a crooked profile with time. Understanding, maintaining, and restoring disrupted aspects of tip support is crucial to avoid the inevitable settling of the tip that occurs when these mechanisms are interrupted².

Methods

Research methods included searching online databases such as Google, Google Scholar, PubMed, and Proquest Central at King Saud University. Use terms like “Pollybeak deformity”, “rhinoplasty”, “etiology”, and “treatment” to find related articles.

Definition of Pollybeak Deformity

A dorsal nasal convexity resembling a parrot’s beak is characteristic of pollybeak deformity, a complication of rhinoplasty³⁻⁵. The under-rotation of the nose is caused by a dorsal hump that forms in the supratip area of the nose and “pushes” the tip downward. There are many possible causes for this. A pollybeak develops when a surgeon, during the intraoperative evaluation of the nose, fails to notice the abnormal tip-supratip relationship that characterizes this malformation. In addition, the surgeon may not be able to foresee the outcome of the nose’s recovery, which might lead to pollybeak deformity. Individuals with thick skin soft tissue envelope have a greater risk of developing supratip scar tissue. The same result can be anticipated as a consequence of the procedure⁶.

The postoperative deformity known as a “pollybeak” occurs when there is an imbalance between the tip and the supratip due to fullness in the supratip^{6,7}.

One of the most prevalent rhinoplasty problems that call for additional surgery is pollybeak deformity. Fullness in the supratip area, like a parrot’s beak, is the defining feature of the pollybeak deformity, which causes under-rotation⁸ by pushing the tip downward. From a total of 1,160 revision rhinoplasties, Hussein and Foda⁹ found that 720 (62% of patients) had a pollybeak deformity, with 71% having more than one factor contributing to the condition, such as overreaction of the dorsum of the nose (28%), a high anterior septal angle (24%), an under-projected tip with poor tip support (68%), and excessive scarring in the supratip (36%). Primary rhinoplasty is a leading cause of pollybeak malformation.

Relevant Anatomy

- Describing and reconstructing two key ligaments in the nose is necessary during a rhinoplasty procedure. Pitanguy^{10,11} represents the first ligament that begins at the underside of the dermis and extends tangentially downward to and between the alar cartilages. Further, Saban and Polselli¹² showed that the Pitanguy ligament can be thin and thick. The superficial medial layer extends caudally from the internal fat pad into the columella, passing inferior to the internal ligament. Following its course into the membranous septum and downhill into the anterior nasal spine¹³, the deep medial layer lies below the internal ligament but above the anterior septal angle.
- The second complicated ligament is the alar scroll ligament. Both the vertical and horizontal parts of this complex have important

therapeutic implications. The internal nasal valve is where the vertical scroll ligament attaches to the bony framework of the nose. The horizontal scroll ligament connects the upper and lower lateral cartilages along their lateral borders¹³.

- When the supratip region takes the lead, it causes an abnormal appearance known as a “pollybeak”. One must fully grasp the mechanics that sustain the nasal tip to foresee the dynamic changes during rhinoplasty. Table I details the various significant and minor tip support techniques⁶.

Etiology

According to Guyuron et al¹⁴, about 9% of those seeking a primary rhinoplasty have an abnormality in their nose’s supratip. In contrast, 39% of primary rhinoplasty patients had pollybeaks, as Foda¹⁵ described. There is a 33%-64% chance of this after secondary rhinoplasty¹⁴⁻¹⁸. Overabundant scarring in the supratip region accounts for 36% of all occurrences of pollybeak⁹, accounting for 62% of the total.

Most secondary rhinoplasties (between 50% and 64%) are performed to treat pollybeaks¹⁹⁻²¹. This malformation may have a few different root causes. This unsightly issue may originate from problems with the cartilage or the soft tissues. Over- or under-projection of the tip, excessive cartilaginous dorsum projection, or excessive bony dorsum resection are common causes of pollybeak²². Other factors include an overabundance of supratip soft tissue or a cephalic orientation of the lateral crura^{14,23}.

Due to the poor re-draping and contraction ability of thick and sebaceous skin^{9,24-26}, patients with thick skin tend to develop a soft tissue pollybeak

Table I. Major and minor tip support mechanisms (Adopted from reference 6).

<p>▪ Major</p>
<p>o Size, shape, and resiliency of the lower lateral cartilages</p> <p>o Relationship of the medial crural feet to the cartilaginous septum</p> <p>o Attachment of the caudal margin of the upper lateral cartilages to the cephalad border of the lower lateral cartilages</p>
<p>▪ Minor</p>
<p>o Interdomal ligament</p> <p>o Cartilaginous dorsum (septum)</p> <p>o Relationship of the lower lateral crura to the pyriform aperture and the sesamoid cartilages</p> <p>o Maxillary crest (nasal spine)</p> <p>o Membranous septum</p> <p>o Attachment of the alar cartilages to the overlying skin soft tissue envelope</p>

deformity. A dead area with infiltration of granulation and fibrotic tissue results if the osseocartilaginous framework is severely diminished, preventing thick skin from entirely re-draping over the depressed dorsum. This is the leading cause of soft tissue supratip deformity, according to most writers^{9,14,25,27,28}, highlighting the importance of proper support for the thick skin and soft tissue envelope.

Re-draping the nasal skin and dead space incorrectly will result in an unnatural appearance, especially in patients with thick skin. Reducing the amount of dead space present makes it possible to prevent soft tissue pollybeak deformity²⁹. Several different approaches to eliminating space have been mapped out and discussed. If the skin does not redrape correctly, some surgeons will employ a suture in the supratip area or apply compressive tape (up to several weeks after surgery). Skin adaptation to the skeletal structure may be aided by thinning the supratip's subcutaneous tissue, but this should be done cautiously to prevent vascular injury and skin necrosis²².

The malformation known as a "pollybeak" is divided into two broad classes. Each can result as a consequence of one or more conditions (Table II)^{8,9}.

Excessive swelling might mask a deformity during surgery. Scar tissue can replace supratip edema after surgery⁶.

Prevention of Pollybeak Deformity

The supratip region is managed by preserving and using a native Pitanguy's ligament, preventing dead space formation and the resulting soft-tissue pollybeak and keeping the tip stable. Dead space is collected, and the alar crease is defined by reattaching the alar scroll ligament complex. The medial cura is not deformed in this method either¹³.

When doing rhinoplasty on rabbits, the subcutaneous approximation suture helps minimize the development of scar tissue in the supratip region. Adopting the supratip transposition flap not only corrects pollybeak deformity but also eliminates dimpled nasal tip depression³⁰. After caudal septal excision, a flap decreased dead space volume in two trials^{31,32}. Flap repair prevents supratip deformity and infiltration of fibrous tissue. In 42 patients undergoing primary rhinoplasty with thick nasal skin, Arslan et al³¹, raised a reverse nasal superficial musculoaponeurotic flap. Although no patients experienced prolonged edema or supratip deformity, two had to have their noses revised at the tip. The surgeon's subjective assessment determined whether or not a patient had a supratip deformity, although the authors did not detail this process. They concluded their approach has potential, but only for a particular subset of patients.

Twenty-four patients with a relatively thick nasal skin envelope were treated with a Pitanguy ligamentous flap by Ercin et al³², and their results were compared retrospectively with those of thirteen patients who did not get a flap. Two separate surgeons and the patient evaluated the images using the same criteria. The aesthetic qualities of the supratip and tip region were considered in both the pre-and postoperative pictures, with scores ranging from 1 (very terrible) to 5 (very acceptable). The lengthiest deviation of the supratip breakpoint from a straight line connecting the nasion and the tip defining point was used to evaluate and quantify alterations in the supratip area. There were no statistically significant differences in supratip distances between groups before surgery. After surgery, no patients showed signs of supratip deformity, and no corrections were sought or necessary. The study's authors found that the procedure was simple to carry out, accurate, and repeatable and that it could aid in preventing supratip deformity.

Table II. Classification of pollybeak deformity (Adopted from reference 6).

<p>▪ Cartilaginous pollybeak</p> <ul style="list-style-type: none"> o Over-resection of the nasal bones o Under resection of the cartilaginous dorsum o Over-resection of the lower lateral cartilages (leading to a loss in tip support)
<p>▪ Soft-tissue pollybeak</p> <ul style="list-style-type: none"> o Poor redraping of inelastic nasal skin o Excessive skin thickness at the nasal tip after reduction of rhinoplasty o Inadequate trimming of the vestibular mucosa after significant reductions o Soft tissue (scar) excess in the region of the supratip

Conrad and Yoskovitch³³ utilized fibrin glue on 30 patients to reduce dead space in the supratip area and enhance skin adaption. The surgeon felt that all of their patients had cosmetically pleasing results. To avoid dead space from forming and to achieve an optimal rotation and projection of the nasal tip in patients with thick skin, Balikci et al³⁴ recently described a supratip suture and skin scoring approach. They tested the method on 24 patients and found it successful everywhere. Before closing the skin, they also injected triamcinolone into the supratip area intraoperatively to reduce swelling. No comparison group was used. The authors did not explore if the effects would be similar if they utilized the supratip suture or the injection separately.

Treatment

Medical Therapy

Soft-tissue pollybeaks can only be treated medically in their earliest stages. Injections of corticosteroids into the dead space of the supratip region can reduce swelling and, eventually, the amount of scar tissue that accumulates there. Patients at high risk of this deformity (such as those with thick nasal skin, low skin elasticity, or substantial nasal reductions) may receive these injections to prevent the deformation or correct an existing pollybeak. To prevent dermal and epidermal alterations (such as hypopigmentation and atrophy), injections must penetrate deeply into the dermis. An option is injecting 0.1-0.5 mL of a 10 mg/mL triamcinolone acetonide solution. The maximum frequency of injectable administration is once every three to four weeks. Saddle nose and other abnormal skin changes may arise from atrophy caused by excessive therapy. Repeated injections result in diminishing returns⁶. Fillers may be an option to camouflage the deformity and correct the dorsal line⁷.

Surgical Therapy

The asymmetrical profile is achieved by balancing dorsal shortening and elongation. The value of a thorough nasal examination before surgery cannot be overstated. This careful examination allows the surgeon to anticipate potential difficulties, think through possible solutions, and practice the surgery in their mind before actually performing it. Patients with over-reduced nasal bones may benefit from a graft placed in the radix region to achieve a more harmonious nose.

Careful intraoperative assessment of the tip connection is advised before resectioning the

under-resected cartilaginous dorsum. To reliably evaluate this connection, tissue edema should be low. Redraping the skin and soft tissue envelope is a prerequisite to assessing the profile of external rhinoplasty. Also, consider the possible tip settling of 1-2 mm after surgery. Open rhinoplasty is the method of choice to improve visibility while operating when correcting a pollybeak deformity. To access the nasal cartilaginous framework in the supra perichondrial plane, a stairstep trans columellar incision is made with infra-cartilaginous extensions. Scarring from a prior rhinoplasty procedure makes a deep dissection necessary to protect the nasal soft tissues from accidental injury during the current procedure. Mid-dorsal nose elevation is done subperiosteally up to the radix⁸.

The pollybeak deformity, caused by an excessive scar over the bridge of the nose, can be surgically corrected by carefully excising the scar without damaging the bridge. Scar tissue linked with grafts implanted in the first rhinoplasty gives more structural support since it is stiffer, and in revision instances, there is usually not enough autologous septal cartilage present for grafting, although long-term effects have not been studied. The anterior nasal spine may be seen by separating the medial crura, and any superfluous cartilage can be removed. They are using a No. 15 blade, and a little incision is made atop the muco-perichondrium along the septum. Both sides of the septum are exposed by lifting the perichondrium⁸.

To accomplish a gradual yet steady dorsal profile reduction, dorsal component reduction is advised³⁵. The pollybeak deformity is fixed by removing excess scar tissue. Next, the nose is helped along in its straightening by undergoing septal repair. The mid vault is reconstructed, and the upper lateral cartilages are repositioned using a cephalic trim technique. The dorsal hump must be reduced without risking inverted-V deformity, internal valve collapse, or unattractive asymmetry in the dorsal morphology. The upper lateral cartilages are freed from the dorsal septum, the septum is resected in stages, the bony dorsum is rasped, and the dorsal aesthetic lines are restored as part of the component dorsal reduction. Auto-spreader flaps and upper lateral tension-spanning sutures eliminate the necessity for routine use of spreader grafts to repair the mid vault⁸ because a progressive decrease of each component retains cartilage.

Most of the septal cartilage is removed, while the L strut over the nose's front and

back is left intact. Microfracture of the inferior turbinates is performed bilaterally in this case. When hypertrophied turbinates impede the airway, a procedure called microfracture of the inferior turbinates is done³⁶. When electrocautery is used, the depressor septi nasi muscle is cut to free the nasal cartilage. Release, centralize, and suture the inferior caudal septum to the anterior nasal spine. Scar tissue is also removed during the cephalic trim⁸.

Patients at high risk for a postoperative pollybeak deformity may benefit from the prophylactic use of fibrin glue. Fibrin glue can improve adhesion if there is a sizable gap between the skin and the cartilaginous skeleton beneath it. This technique helps maintain a more defined nose tip by decreasing the likelihood of scar tissue formation. Instead, an absorbable suture can be placed from the dermis to the deep tissues (cartilaginous dorsum of the supratip) to cause the skin to re-drape correctly in patients with thick skin. This suture may require multiple attempts to position it before appropriately being tied⁶.

Conclusions

Pollybeak deformity denotes the surgical deformity associated with fullness in the supratip, leading to a disproportionate relationship between the tip and the supratip. Patients with a pollybeak deformity may feel self-conscious about their avian-like noses. As a result, these conditions necessitate medical or surgical intervention.

Ethics Approval

Ethics Committee approval was not needed as it is a review.

Conflicts of Interest

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