Correction of the Soft Tissue Pollybeak Using Triamcinolone Injection

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Objective: To describe the technique for correction of the soft tissue pollybeak deformity using intralesional injection of triamcinolone acetonide.

Methods: We discuss our philosophy, regimen, and technique for treatment of the soft tissue pollybeak using triamcinolone injection. We include results from a series of 173 patients who underwent rhinoplasty performed by one of us (N.J.P.).

Results: Triamcinolone was injected at 1 week after surgery in 127 patients (73%). A second injection was performed in 92 (72%) of the 127 patients at 4 weeks after surgery. One hundred eight (85%) of the 127 patients had an acceptable result, as judged by the surgeon, with good supratip definition. Nineteen (15%) of the 127 patients had a less than optimal result, with residual supratip fullness, as judged by the surgeon. There were no complications caused by triamcinolone injection.

Conclusions: Because revision surgery is difficult and may be associated with complications, intralesional triamcinolone injection is the first-line treatment for the soft tissue pollybeak deformities caused by subdermal scarring. Should intralesional steroid injection fail to satisfactorily treat the deformity, revision rhinoplasty can subsequently be performed.

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The pollybeak deformity is one of the most common complications of rhinoplasty. It is a convexity of the nasal supratip relative to the rest of the nose. This deformity is colloquially known as pollybeak because the lower two thirds of the nose takes on the convex profile of a parrot’s beak. The pollybeak is not due to transient postoperative edema but represents a persistent, unattractive fullness that distorts the dorsal profile and obscures the tip.

While the pollybeak may be the result of technique, it may also be an unpredictable complication for even the most experienced surgeons. The causes of pollybeak include inadequate resection of supratip structures, most commonly the dorsal septal cartilage or the cephalic margins of the lower lateral cartilages; loss of tip support; or, paradoxically, excessive cartilage resection in the supratip region that results in subcutaneous scar tissue formation, often in conjunction with thick nasal tip skin. If excess cartilage is the cause, the condition is called a cartilaginous pollybeak, and simple trimming of this cartilage will solve the problem. With loss of tip support, a cartilage strut or tip graft can be placed to correct or disguise the deformity.

A more difficult problem is the pollybeak deformity that occurs paradoxically as a result of overresection of the lower dorsal cartilaginous septum and/or the cephalic margins of the lower lateral cartilages in the area of the supratip. This deformity usually occurs in combination with thick nasal skin, resulting in inadequate skin contraction and excessive dead space between the skin and the septal border, which fills with scar tissue and results in a supratip fullness. The patient who requires revision rhinoplasty with major alar and septal cartilage resections to correct a cartilaginous pollybeak deformity is also at risk for formation of dead space that may fill with scar tissue and result in a soft tissue pollybeak.
TECHNIQUE

A 1-ml tuberculin syringe with a 30-gauge needle is used. The triamcinolone should be shaken well, as it comes in suspension rather than as a solution. The technique of administering triamcinolone can be performed as 2 separate lateral supratip injections or as a single midline supratip injection in which the needle is redirected to the left and right sides (Figure 1).

The depth of injection should be in the subcutaneous tissue. If blanching is seen, the injection is in the dermis, and the tip of the needle should be directed deeper. Injection of triamcinolone into the dermis can result in cutaneous atrophy. As is standard practice in intralosional injection techniques, the surgeon should attempt aspiration with the syringe first to ensure that the needle tip is not within a blood vessel. This cannot be overemphasized, as injection of triamcinolone into a blood vessel can have hazardous consequences for the patient (see the “Comment” section). Aspiration before injection may also facilitate the diagnosis and treatment of a seroma that is masquerading as a soft tissue pollybeak in the early postoperative phase.

A splint may be placed back on the nose in thick-skinned individuals after the first injection and left in place for approximately 1 week. The splint should fit well with adequate pressure over the supratip but should not extend onto the domal area or cover the tip region. Patients should be informed that the supratip area may look swollen for several days. They are assessed every 4 weeks after injection, and subsequent injections are administered based on the tissue response. Restraint must be used in the decision to repeat an injection to prevent overtreatment and the consequent atrophy that may produce a saddle nose or irregular skin deformity. Generally, no more than 4 to 6 injections are administered over time.

The amount of triamcinolone used varies depending on whether the intent is preventative or curative. In the early postoperative phase, triamcinolone injections are administered every 3 to 6 weeks until the deformity resolves. As is standard practice in intralesional injection techniques, the surgeon should attempt aspiration of blood vessels before injection may also facilitate visualization of the supratip area is palpated. Postoperatively, triamcinolone injections are monthly beginning 1 month after surgery. At that time, supratip fullness is visually assessed and, if evident, will inject 0.1 to 0.2 mL of triamcinolone acetonide at a concentration of 10 mg/mL (1 to 2 mg). Subsequent injections in the same quantity are then administered every 4 weeks as needed using either the 10- or the 40-mg/mL suspension, based on the response to the prior injection. The total amount of triamcinolone used is guided by the response of the deformity, which varies from patient to patient. In referral cases in which a soft tissue pollybeak has already formed from previous surgery, 0.1 to 0.2 mL of triamcinolone acetonide at a concentration of 40 mg/mL (4-8 mg) is injected (Figure 2).

Another one of us (N.J.P.) begins injections earlier in the postoperative course to address incipient formation of the soft tissue pollybeak. Evaluation of the supratip area is performed 1 week after surgery. At that time, supratip fullness is visually assessed and the supratip area is palpated. If there appears to be fullness or if there is blotted edema of the supratip, a small amount of triamcinolone acetonide, 0.1 mL of a 10-mg/mL suspension (1 mg), is injected subcutaneously. The patient is seen again at 1 month after surgery and another injection is administered at that time if residual fullness is present.

The Table summarizes the regimens used by several authors. Note that more recent reports have recommended smaller dosages than those used by Rees and Mahe, who were among the first to describe the technique in detail and had very successful results. Also, Holt et al recommend an injection of 3 mg of triamcinolone acetonide into the supratip region every 3 to 6 weeks until the edema is resolved. Cook and Guida recommend treating the soft tissue pollybeak with 10-mg/mL triamcinolone acetonide injections monthly beginning 1 month after surgery until the deformity resolves.

RESULTS

A retrospective review of the experience of one of us (N.J.P.) with rhinoplasty was performed. One hundred seventy-three rhinoplasties were performed over a 13-month period. The patients (139 women and 34 men) ranged in age from 15 to 78 years. One hundred nineteen patients underwent primary rhinoplasty (91 women and 28 men), and 54 patients underwent revision rhinoplasty (48 women and 6 men). These rhinoplasties were performed with the cartilage delivery technique in patients who demonstrated adequate tip support before surgery. An external splint was placed at the conclusion of surgery and was removed in 1 week, at which time the supratip was visually assessed and palpated. Postoperative follow-up lasted a minimum of 6 weeks.

Triamcinolone acetonide (10 mg/mL) was injected subcutaneously into the supratip region per the author’s protocol at 1 week after surgery in 127 patients (73%). The group included 84 (70%) of 119 primary rhinoplasties and 43 (80%) of 54 revision rhinoplasties. Ninety-two (72%) of the 127 patients required a second injection with triamcinolone acetonide at a concentration of 25 mg/mL at 4 weeks after surgery. The decision to treat with triamcinolone was made by the surgeon (N.J.P.).
One hundred eight (85%) of the 127 patients who received injections had an acceptable result, with good supratip definition, as judged by the surgeon. Nineteen (15%) of the 127 patients had a less than optimal result, with residual supratip fullness, as judged by the surgeon. There were no permanent complications from the injections in any of the patients in this series.

**COMMENT**

Triamcinolone acetonide is commercially available as an injectable suspension in concentrations of 10 and 40 mg/mL, but it can be diluted to lesser concentrations with either 1% lidocaine hydrochloride or normal saline. The package insert states that triamcinolone acetonide at a concentration of 10 mg/mL (Kenalog-10; Bristol-Myers Squibb Co, Princeton, NJ) is intended for intradermal and intra-articular use. Intradermal applications include treatment of a wide range of disorders, including keloid scars, discoid lupus erythematosus, necrobiosis lipoidica diabeticorum, lichen planus, psoriatic plaques, granuloma annulare, and lichen simplex chronicus. Triamcinolone acetonide at a concentration of 40 mg/mL (Kenalog-40; Bristol-Myers Squibb Co) is intended for intramuscular and intra-articular use. We describe herein subcutaneous intrallesional rather than intradermal injection of triamcinolone acetonide at concentration doses of up to 40 mg/mL.

Intrallesional injection of keloid and hypertrophic scars with triamcinolone was first described in the 1965 by Maguire. Intradermal applications include treatment of a wide range of disorders, including keloid scars, discoid lupus erythematosus, necrobiosis lipoidica diabeticorum, lichen planus, psoriatic plaques, granuloma annulare, and lichen simplex chronicus. Triamcinolone acetonide at a concentration of 40 mg/mL (Kenalog-40; Bristol-Myers Squibb Co) is intended for intramuscular and intra-articular use. We describe herein subcutaneous intrallesional rather than intradermal injection of triamcinolone acetonide at concentration doses of up to 40 mg/mL.

Intrallesional injection of keloid and hypertrophic scars with triamcinolone was first described in the 1965 by Maguire. Triamcinolone is used in hypertrophic and keloid scars as both a primary treatment and prophylactically after surgical scar excision to prevent recurrence. Significant action of the agent is discernible in tissues for up to 6 weeks. Darzi et al reported symptomatic relief in 72% and complete flattening in 64% of keloid and hypertrophic scars injected with triamcinolone. It has therefore been recommended as a first-line treatment for small keloids.

The exact mechanism by which steroids reduce scarring has not been fully elucidated. Corticosteroids decrease fibroblast proliferation and inflammatory responses. This action results in decreased collagen and glycosaminoglycan synthesis with decreased tissue fibrosis. Corticosteroids also inhibit collagenase inhibitors, resulting in increased collagen degradation. Prophylactic and early treatments should therefore have a greater clinical effect, as they are associated with both decreased scar proliferation and increased degradation. Later, revision treatment may have less effect, because it takes place after the period of scar proliferation and is associated with increased collagen degradation.

![Figure 1. Placement of subcutaneous intrallesional triamcinolone acetonide injection for soft tissue pollybeak deformity.](image1)

![Figure 2. A, Presurgical photograph of a 22-year-old woman who underwent rhinoplasty, chin augmentation, and submental liposuction. B, Photograph taken 7.5 weeks after surgery demonstrates early formation of a soft tissue pollybeak, which was treated with triamcinolone acetonide at that time. C, Photograph taken 7 months after surgery. D, Posttreatment photograph taken 9.5 months after surgery shows resolution of the soft tissue pollybeak.](image2)
with increased scar degradation alone. Because of the dual activity of triamcinolone before scar proliferation, early injection requires less agent. Our method therefore requires a lower concentration (10 mg/mL) of triamcinolone acetonide for intraoperative and early postoperative treatments and a higher concentration (40 mg/mL) for revision cases with curative rather than preventive intent.

The major risk of treatment with triamcinolone injections is subcutaneous atrophy. The rate of subcutaneous atrophy in hypertrophic and keloid scar treatment reported by Darzi et al was 4%. Because triamcinolone remains active in the tissue for 4 to 6 weeks, reinjection should probably not take place before this period because there may be a higher accumulation of corticosteroid than desired. Other potential complications include depigmentation, telangiectasia formation, necrosis, and ulceration. Rarely, symptoms of Cushing syndrome have been reported but are usually reversible. A recent report described an occurrence of complete and irreversible blindness resulting from steroid injection into the dorsum of the nose to treat subcutaneous scarring. Presumably, the blindness was caused by a microembolus of injected vessels. To our knowledge, there have been no other reports of blindness associated with steroid injection of the nasal dorsum, but blindness has been described as a complication of nasal turbinate steroid injection.

We know of no studies that have quantitatively evaluated the systemic effects of intranasal injection of triamcinolone for the pollybeak deformity. Mabry found that slight systemic absorption was evident 3 days after intratubinal injection with 40 mg of triamcinolone acetonide for nasal turbinate hypertrophy, with some depression of plasma cortisol lasting up to 1 week in 4 (30%) of the 14 patients studied. Cortisol values, however, were not lower than normal limits at any time, and no adrenal suppression was apparent after repeated injections.

If steroid injections do not fully correct the pollybeak deformity, revision surgery can be performed. The scar tissue is excised, and a compressive tape and nasal dorsal splint are applied. The compressive tape should be maintained for at least 3 weeks. If the cartilaginous septum or the dorsal borders of the upper lateral cartilages are too high, they can also be trimmed during surgical revision. Augmentation of the upper dorsum may be needed in patients with very thick supratip skin in order to create a straight-appearing dorsal line. Tip grafts may also be used to refine and protect the tip above a thick supratip that will not respond to therapy.

Dorsal autologous grafts can also be used when the illusion of supratip fullness is caused by excessive high dorsal resection when the remaining nasal skin does not shrink down. Prophylactic triamcinolone injections can be administered at the time of surgery and during the recovery period according to the protocol we have outlined. Revision surgery should be delayed for at least 6 months after the initial surgery.

It is preferable, however, to avoid surgery if possible. Subdermal dissection with resection of scar tissue in revision surgery is difficult to perform and may lead to complications. Irregular thinning, adhesions, telangiectasias, vertical grooves, furrows, and possible skin loss may result. In general, subcutaneous triamcinolone injection into the scar tissue is the preferred first-line treatment for soft tissue pollybeak, as it is well tolerated and has minimal risk of exacerbating the deformity. If the triamcinolone injections are not effective, surgical revision remains a possibility for correction of the deformity.

Systemic steroids, such as dexamethasone, are used by some rhinoplastic surgeons to decrease postoperative eyelid and nasal edema as well as discomfort or pain. It is not known whether use of systemic steroids at the time of surgery may reduce the incidence of the pollybeak deformity. Several other modulators of the wound healing process are also currently being explored as intranasal or systemic treatment for keloids and hypertrophic scars. These modulators include isotretinoin, interferon gamma, interferon alfa, and tamoxifen citrate. For example, isotretinoin combined with triamcinolone appears to significantly inhibit the growth of keloid fibroblasts in cell culture. Whether these treatments alone or in combination with triamcinolone injection will prove to be effective treatment for the postrhinoplastic pollybeak remains to be seen.

### Triamcinolone Regimens Recommended by Various Authors for Treatment of the Soft Tissue Pollybeak

<table>
<thead>
<tr>
<th>Source, y</th>
<th>Triamcinolone Acetonide, Dosage</th>
<th>First Treatment After Surgery</th>
<th>Repeated at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rees, 1971</td>
<td>0.2-0.5 mL of 10 mg/mL (2-5 mg)</td>
<td>Not stated</td>
<td>1- to 2-wk intervals as needed</td>
</tr>
<tr>
<td>Mahe et al, 1974 and 1979</td>
<td>0.25-0.5 mL of 40 mg/mL (10-20 mg)</td>
<td>Not stated</td>
<td>3 wk if needed</td>
</tr>
<tr>
<td>Guyuron et al, 2000</td>
<td>0.1-0.2 mL of 40 mg/mL or 0.2-0.4 mL of 20 mg/mL (4-8 mg)</td>
<td>4 wk</td>
<td>4-wk intervals (3 injections maximum)</td>
</tr>
<tr>
<td>Gruber, 2000</td>
<td>0.1-0.2 mL of 10 mg/mL (1-2 mg) mixed with an equal volume of lidocaine hydrochloride</td>
<td>4-6 wk</td>
<td>1- to 2-wk intervals as needed</td>
</tr>
<tr>
<td>Present study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N.J.P.</td>
<td>0.1 mL of 10 mg/mL (1 mg)</td>
<td>1 wk</td>
<td>4 wk after surgery with 0.1 mL of 25 mg/mL (2.5 mg) if needed</td>
</tr>
<tr>
<td>R.W.H.K.</td>
<td>0.1-0.2 mL of 10 mg/mL (1-2 mg)</td>
<td>2 wk</td>
<td>4 wk using 0.1-0.2 mL of 10 mg/mL or 40 mg/mL (1-2 mg or 4-8 mg, respectively) depending on results of previous injection (4-6 injections maximum)</td>
</tr>
</tbody>
</table>
CONCLUSIONS

Because revision surgery is difficult and may result in complications, subcutaneous intralesional triamcinolone injection is the first-line treatment for the soft tissue polybeak deformity. The technique is straightforward, and good results may be achieved. Subcutaneous injection into the scar tissue may be accompanied by infrequent adverse effects, most commonly subcutaneous atrophy; therefore, injections should be administered only in the subcutaneous level of the supratip, where the overlying skin is thick. Should intralesional steroid injection fail to satisfactorily treat the deformity, revision rhinoplasty can still be performed 6 months after the initial surgery.

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REFERENCES