

# Minimally Invasive Rhinoplasty Techniques and Innovations

## Abstract

Nasal rejuvenation is a highly sought-after aesthetic procedure, addressing concerns such as nasal wrinkles, sagging skin, and irregular contours. Non-surgical rhinoplasty has emerged as a transformative alternative to traditional surgical procedures, offering patients non-invasive and minimally invasive options to enhance nasal aesthetics and correct minor imperfections. The non-surgical Rhinoplasty these days is not only limited to dermal fillers but can be combined with other minimally invasive modalities too. The various techniques utilized in non-surgical rhinoplasty are dermal fillers, botulinum toxin (Botox), Hi-Ku threads, and fibroblasting. By understanding these techniques principles, indications, and limitations, practitioners can provide personalized treatment plans to achieve optimal results. This article explores the various techniques, including dermal fillers, hiko nose threads, Botox, and fibroblasting, and delves into these advanced techniques, their mechanisms, applications, and outcomes for nasal rejuvenation. Each modality offers distinct advantages, catering to different patient needs while minimizing downtime and risks. Modern non-surgical approaches like fibroblasting, Botox, and thread lifts have revolutionized nasal aesthetic treatments, offering minimally invasive options with effective, natural-looking results. By understanding the nuances of dermal fillers in liquid rhinoplasty, practitioners can help patients achieve enhanced nasal aesthetics with confidence and precision.

**Keywords:** non-surgical rhinoplasty, dermal fillers, hiko nose threads, botox, fibroblasting, aesthetic medicine, minimally invasive

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## Introduction

Non-surgical rhinoplasty has emerged as a transformative approach in aesthetic medicine, allowing individuals to modify their nasal appearance without the invasiveness of traditional surgery. This technique caters variety of patient's expectations seeking enhancements ranging from minor adjustments to significant contour changes. The increasing demand for less invasive procedures has spurred the development of various techniques, each with unique applications, benefits, and considerations.

## Various techniques and their applications are discussed below

### I. Dermal fillers

Dermal fillers, primarily hyaluronic acid-based, are the cornerstone of non-surgical rhinoplasty. Dermal fillers are injectable substances that temporarily enhance facial structures. The commonly used fillers for liquid rhinoplasty are discussed above.

### II. Hyaluronic acid (HA) fillers

**Examples:** Juvederm, Restylane.

**Properties:** HA fillers are soft, gel-like, and hydrophilic, providing natural-looking results.

**Reversibility:** Results can be reversed using hyaluronidase, making HA fillers a safe choice.

### III. Calcium Hydroxyapatite (CAHA) fillers

**Example:** Radiesse.

**Properties:** Provides a thicker consistency and longer-lasting results compared to HA fillers.

**Use:** Suitable for structural support and contouring.

Also suitable for candidates who need subtle long lasting changes and will never opt for surgery.

### IV. Polymethylmethacrylate (PMMA) fillers

**Example:** Bellafill.

**Properties:** Semi-permanent filler for long-term enhancements.

**Use:** Reserved for experienced practitioners due to its permanence without functional deformity.

### Procedure steps

**Consultation:** Detailed discussion to understand the patient's concerns, expectations, and suitability for the procedure. Diagnostic Nasal Endoscopy and CT PNS is performed if required to rule out any functional deformity or paranasal sinus pathology.

**Preparation:** Cleaning and numbing the nasal area with topical anesthetics.

Marking the injection points based on the desired outcome.

**Injection:** The filler is carefully injected using a fine needle or cannula.

Strategic placement of filler at subperiosteal plane ensures contouring, lifting, and smoothing as required.

**Post-Injection:** Gentle molding of the filler to achieve the desired shape.

Monitoring for any immediate adverse reactions.

### Benefits of Dermal Fillers in Liquid Rhinoplasty

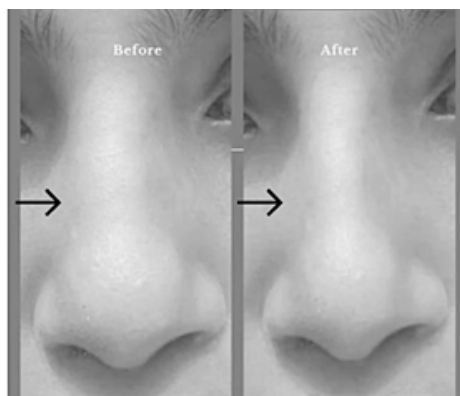
**Non-Invasive:** No incisions or extra recovery period is required.

**Customizable:** Results can be adjusted during or after the procedure.

**Reversible:** Particularly with HA fillers, corrections are easily made.

**Quick Recovery:** Minimal swelling or bruising; most patients resume daily activities immediately.

**Cost-Effective:** Less expensive than surgical rhinoplasty (Figure 1).



**Figure 1** Showing before and after results of the patient demanding for slim nose.

**Risks and limitations:** While liquid rhinoplasty is safe in the hands of skilled practitioners, it is not without risks

**Side Effects:** Immediate reaction with HA fillers include Swelling, bruising, redness, paraesthesia, pain and haematoma or tenderness at injection sites.<sup>1</sup>

Lumps and Tynhdall Effect can also be seen at injection site.

**Vascular Complications:** Accidental injection into a blood vessel can lead to complications like tissue necrosis or vision loss.<sup>2</sup>

**Temporary results:** Lasts 6–14 months depending on quality and G Prime requiring maintenance treatments.

**Limited Scope:** Cannot reduce nose size or address functional issues like breathing difficulties. Overfilling of filler can lead to avatar like facies in subsequent session due to migration (Figure 2).



**Figure 2** showing avatar like facies due to overuse of filler in nose and migration of fillers. Source Dr Rachel Ho Blog 06 June 2024

These side effects can be minimised with knowledge of anatomy, injection training and proper technique, and through careful patient selection, counselling and preparation.<sup>3</sup>

### Candidates for Non-Surgical Rhinoplasty

Individuals seeking subtle cosmetic enhancements.

Especially Minor post-surgical asymmetries corrections.

Those unwilling to undergo surgery with realistic expectations without any septal deformity (Figure 3).



**Figure 3** Showing Dorsal Augmentation in very thin skin patient.

### Contraindications

Severe nasal deformities.

Allergies to filler components.

Functional Deformity or if Reduction Rhinoplasty is required.

Active skin infections or inflammation in the treatment area.

### Applications

Straightening dorsal humps

Refining the nasal tip

Enhancing bridge height

### Advantages

Immediate results

Reversible using hyaluronidase

Minimal downtime

### Considerations

Risk of vascular occlusion is there so one should be ready to handle the complications.

Results lasts for 9–24 months depending on products quality.

### V. Botox (Botulinum toxin)

Botulinum toxin (Botox) offers a versatile approach for addressing dynamic wrinkles and reshaping the nose. Botox complements filler treatments by addressing functional and aesthetic nasal concerns.

### Mechanism

Botox blocks acetylcholine at neuromuscular junctions, temporarily paralyzing muscles and softening wrinkles. Botox relaxes muscles to improve symmetry or reduce tension-related deformities.

### Applications

Bunny Lines: Smooths horizontal lines on the nasal bridge.

Nasal Tip Lift: Relaxation of the depressor septi muscle, subtly elevating the nasal tip.

Nostril Flare Reduction: Minimizes the appearance of wide or flared nostrils.

### Procedure

1. A thorough assessment determines injection sites.
2. Botox is injected using a fine needle.
3. Effects appear within 3–7 days, lasting 3–6 months.

### Benefits

Quick procedure with no downtime.

Enhances nasal symmetry and contour subtly.

Narrowing flared nostrils

Elevating a drooping nasal tip caused by excessive depressor septi nasi muscle activity

### Advantages

Quick treatment time

Effects last 3–6 months

Apart from lifting tip and reducing flare helps in decreasing acne, sweating, black heads and open pores

### Considerations

Limited to dynamic imperfections.

Common side effects include ecchymosis bleeding, swelling, erythema, pain and bruising which can be minimized by ice packs and using thinner needles.

Botox complications are relatively rare include malaise, nausea, influenza-like symptoms. Ptosis, asymmetry of smile can also occur due to local diffusion of botox .<sup>4,5</sup>

Multiple sessions of botox may lead to muscle atrophy.

### VI. Hi-ku nose threads

Hi-Ku threads represent an innovative approach to enhance nasal contours using absorbable sutures. Also known as poor's man Rhinoplasty as it's most cost effective amongst all. Thread lifting uses bio-absorbable threads to lift and reshape the nasal structure. Threads are inserted into the subdermal layer, providing mechanical support and stimulating collagen production. Over time, the threads dissolve, leaving a natural scaffold of new collagen

**Mechanism:** Threads are inserted into the nose to create scaffolding, stimulating collagen production and lifting tissues. The threads act like scaffolding to the structure of nose, giving it immediate mechanical support and enhancing your nose's shape and definition.

Biochemically: PDO (polydioxanone), is biocompatible and has been proven to stimulate collagen production. It increases collagen and tissue fibroblasts in the surrounding tissues which in turn stimulates both collagen production and tissue fibroblasts to maintain elevated nose bridge and nose tip

### Applications

Nasal Bridge Augmentation: Enhances definition and height.

Lifting the nasal tip

Straightening and defining the nasal bridge creating slimmer nose.

### Procedure

1. Local anesthesia is administered.
2. Threads are inserted using a 23 G cannula or needle.
3. Adjustments are made to achieve the desired shape or can be combined with fillers to get the desired augmentation and can be combined with autologous fat grafting<sup>6</sup> (Figure 4)



**Figure 4** Showing before and after results of patient with Hiku threads and filler.

### Advantages

Semi-permanent results (12–24 months)

Minimal invasive

Most Cost effective non-surgical option to opt for.

### Considerations

Requires advanced skill to avoid complications.

Post-treatment swelling and mild discomfort.

Risk of infection and granuloma formation.

Generally up to 6 threads are required for augmentation. In Indian noses 3-4 threads are sufficient to create substantial augmentation.

### VII. Fibroblasting (plasma pen)

Fibroblasting, or plasma fibroblast therapy, is a non-invasive technique that stimulates fibroblasts in the dermis to produce collagen and elastin. Fibroblasting employs plasma energy to tighten and resurface skin, improving minor nasal imperfections.<sup>7</sup>

**Mechanism:** Plasma energy creates micro-injuries, stimulating fibroblast activity and collagen remodeling.

### Types of Threads

PDO (Polydioxanone): Stimulates collagen and lasts 6–12 months.

PLLA (Poly-L-Lactic Acid): Provides longer-lasting results (12–18 months).

## Applications

Tightening nasal skin

Reducing fine lines or scars on the nose

Reduces Pores, acne breakouts

Decreases hypertrophy of sebaceous glands leading to slimmer nose.

## Procedure

1. Numbing cream is applied for patient comfort.

2. A handheld plasma device delivers controlled energy to the targeted areas.

3. Post-procedure redness and scabbing occur, subsiding within 7–15 days.

## Advantages

Non-invasive

Long-lasting skin tightening effects which last upto 2 years.

## Considerations

Results develop gradually over weeks

Not suitable for structural corrections

Associated with long downtime with risk of Post Inflammatory Hyperpigmentation (Figure 5A-5D).



**Figure 5** Showing stages of healing with final before and after results of patient who underwent Plasma fibroblasting.

## Conclusion

Nasal rejuvenation using fibroblasting, Botox, and thread lift represents a paradigm shift in aesthetic medicine. Remarkable results with minimal downtime. Non-surgical rhinoplasty exemplifies the advancements in aesthetic medicine, blending art and science to deliver results with minimal downtime. Each technique offers unique benefits, enabling practitioners to customize treatments to individual needs. As technology evolves, these approaches are poised to become even more refined, ensuring better safety and patient satisfaction. These techniques have revolutionized nasal aesthetics by offering safe, effective, and minimally invasive option for patients desiring cosmetic improvements specially who are scared to go under knife.

While nonsurgical rhinoplasty does not replace traditional surgical rhinoplasty, it is an excellent alternative for those seeking minor corrections with minimal risk and downtime. As an ENT and Rhinoplasty Surgeon one should have knowledge of all the surgical and nonsurgical methods for nasal rejuvenation. Patients satisfaction and happiness is of utmost importance when it comes to aesthetics. One should have all the surgical and non surgical tools in their armamentarium and offer quality service and choices according to patient's needs, budget and downtime associated with it. With proper patient selection and execution, practitioners can achieve high levels of patient satisfaction and transformative outcomes.

## Future perspectives

Emerging techniques and materials, such as bio-stimulating fillers and advanced thread technologies, structural fat grafting are likely to further enhance the scope of non-surgical rhinoplasty. Long-term studies and innovations in imaging and planning tools may revolutionize how practitioners approach nasal aesthetics.

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## Conflicts of interest

The author declare that there are no conflicts of interest.

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