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Sutures or Resection of the Protruding End of Medial Crura

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Abstract

The anatomic alterations of the columella may compromise aesthetically both the nasal base and its function.

This article describes how to diagnose compromised structures and how to solve them in a simple and minimally invasive way. In addition, we show how to anticipate the changes that we create according to the chosen technique in the nasal tip (the dynamic of the nasal tip).

Keywords: Medial crural, Nasal tip sutures, Footplates, Nasal tip, Nostril, Columella, Nostril test, Divergent alar cartilages, Asymmetrical footplates, Wide columella, Columella show, Rhinoplasty, Nasal defect, Nasal valves, Alar cartilage, Resection of the footplates, Deprojection of the nasal tip, Nasal base, Anatomical alterations of the columella, Narrow nostril

1. Introduction

1.1. Anatomy of the lateral alar crura

The nasal tip is supported by two arches composed of the lateral crura laterally, and the medial crura and the footplates medially. The medial crura function as pillars founded on the footplates.

The posterior 5–6 mm of the medial crura, which course laterally and often posteriorly, are called the footplates, and play a major role in the aesthetics of the nasal tip and therefore in rhinoplasty. The distance between the footplates ranges from 7.5 to 15 mm, the average being 11.4 mm.

Should the patient exhibit an overprojected tip, the result will be a divergent footplate (Fig. 1).

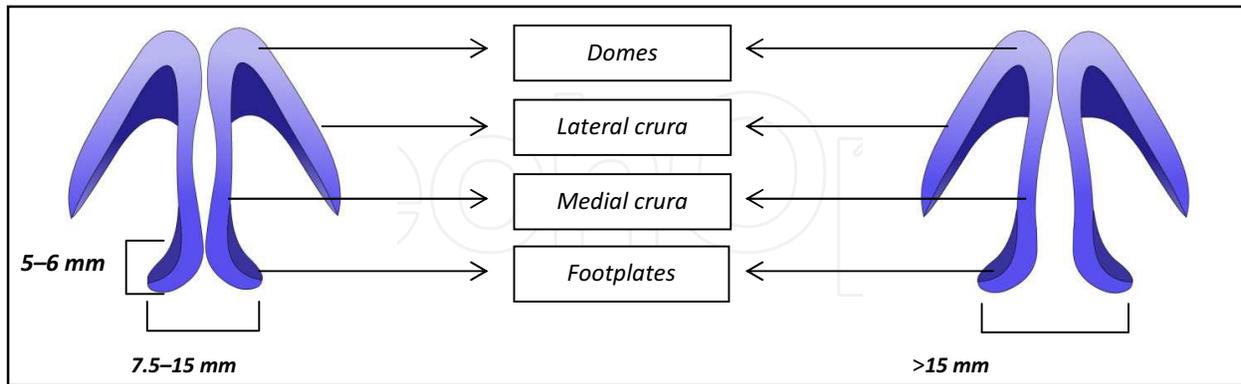


Figure 1. Anatomy of the lateral inferior cartilages with its portions, measures of its footplates (5-6 mm), normal distance between them (7.5-15 mm), and divergent lower lateral cartilages.

The columella is a relatively complex anatomical structure that is located in the nasal base between the nostrils. It is made of crura, muscle, skin, and soft tissue and does not only provide support to the nose but it is also an aesthetic component of great importance.

At the base of the columella the footplates protrude laterally giving amplitude to then adapt at the level of the medial crura. Deformities of the lower lateral cartilages lead to untoward aesthetics and functionality of the nostril and columella.

The ideal nostril possesses a teardrop shape with a long axis extending from the base to the apex. There is slight medial tilt of the long axis toward the midline (Fig. 2).

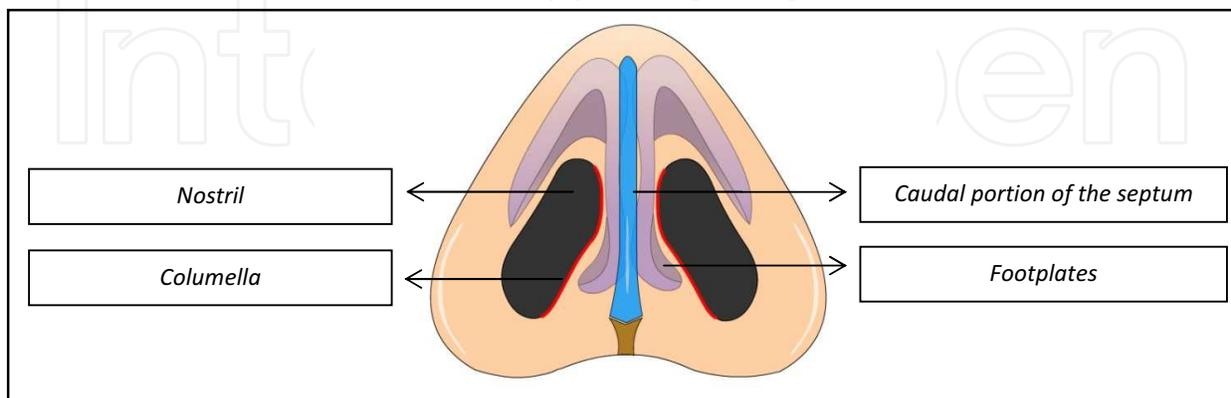


Figure 2. Nasal base which shows the columella, its cartilaginous structures, and the nostrils normal shape.

The columella shows a vast variety of deformities, anomalies, and variations that can result from genetic factors, trauma, altered growth, previous surgeries, or infections. The analysis of the deformity and its pathogenesis is of great importance as it will determine the surgical technique to follow.

In this article, we will focus on increasing the width of the columella as a result of one or both footplates being asymmetric in length, conformation (abnormally folded), and/or too separated and consequently protruding through the skin into the nasal vestibule. These entities may exist alone or in combination.

Anatomical alterations of the columella compromise the aesthetics of the nostrils and potentially its function, which is why the intimate relationship between nasal anatomy and physiology is crucial in rhinoplasty.

It is important to highlight that the ventilation can be affected especially when this alteration is combined with a narrow nostril, deviation or subluxation of the caudal portion of the nasal septum. A simple and effective method to evaluate this is the **Nostril Test** (test of columellar narrowing).

It consists of narrowing the lower third of the columella with bayonet forceps, this way we open the external nasal valve and ask the patient if this maneuver improves nasal ventilation (Fig. 3).

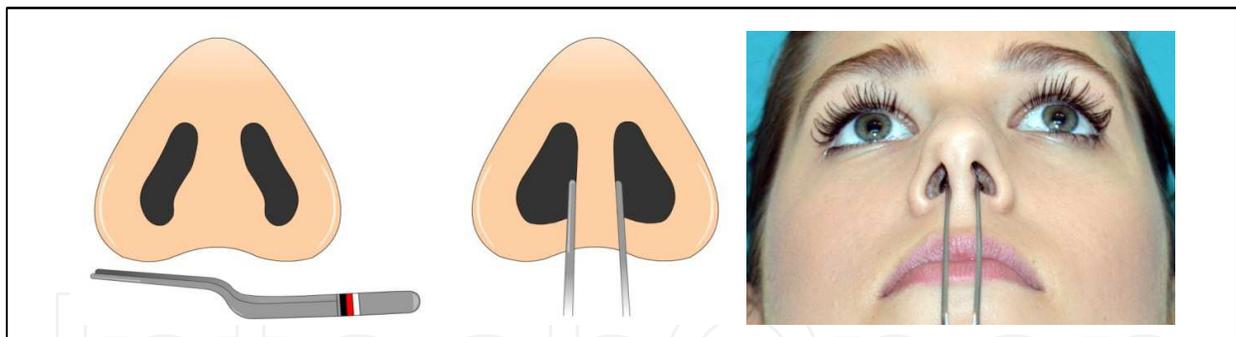


Figure 3. It can be observed how the base of the columella is narrowed by the bayonet forceps to evaluate if throughout this maneuver we generate any repercussion on the nasal ventilation (Nostril Test).

2. Etiopathogenesis

The causes that create an increase in the width of the columella can be divided into primary and secondary causes.

Primary causes: are those in which the alteration is in the lower lateral cartilages:

- Divergent alar cartilages associated with an excessive amount of soft tissue between the two intermediate pillars and footplates (Fig. 4a, b).
- Asymmetrical footplates in size and/or shape (retracted) (Figs. 5a, b).

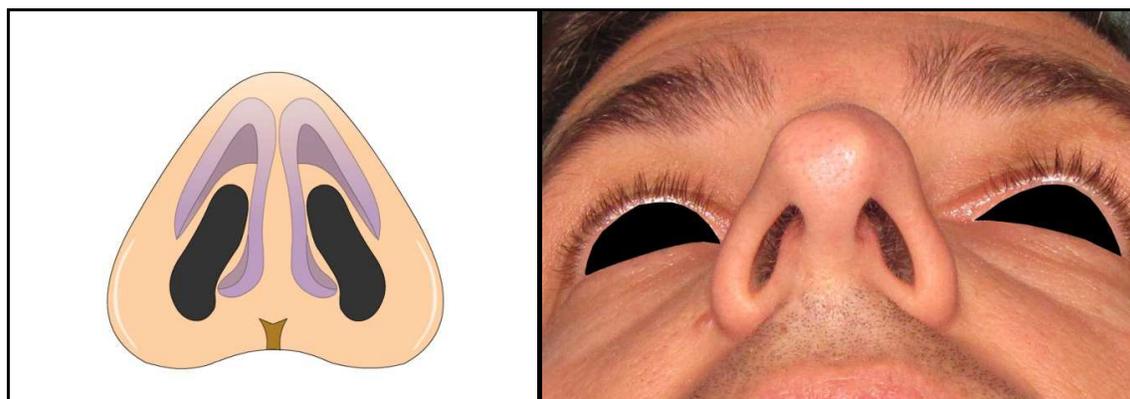


Figure 4. a, b) It can be observed how the columella widens symmetrically when both side pillars are divergent.

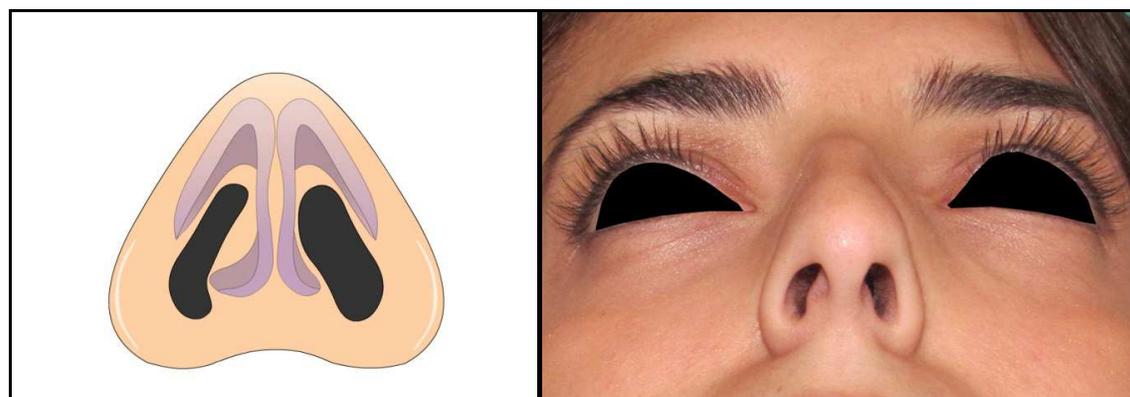


Figure 5. a, b) It can be observed how the columella widens asymmetrically at the expense of a longer and/or more bended lateral pillar.

Secondary causes: are those where there is an alteration of the medial pillars and footplates, either in shape and/or position triggered by adjacent structures (the caudal portion of the nasal septum and nasal spine).

- The deviation of the caudal portion of the nasal septum can displace the footplate of the alar cartilage and widen the columella (Fig. 6a, b).
- The deviation of the nasal spine can produce a deviated nasal septum and a displacement of the footplate of the alar cartilage and widen the columella (Fig. 7a, b).

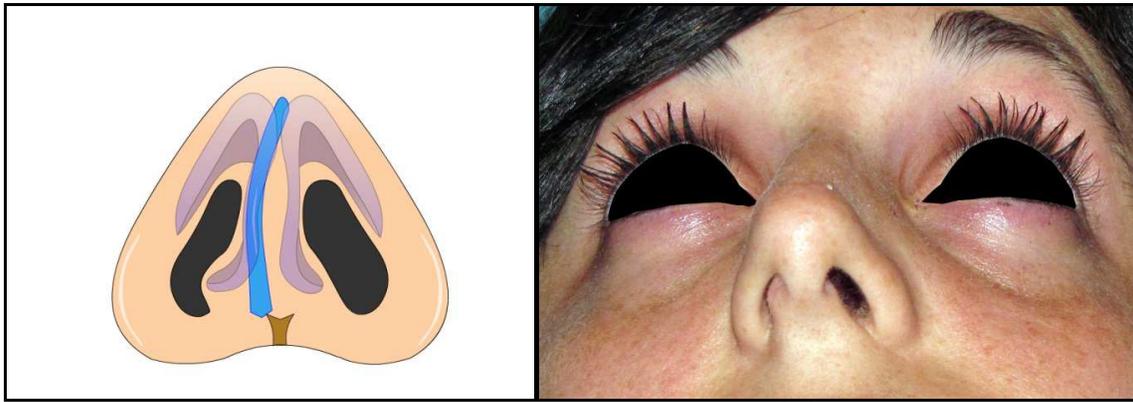


Figure 6. a, b) Deviation of the caudal portion of the nasal septum that produces a displacement of the footplate of the alar cartilage widening the columella.

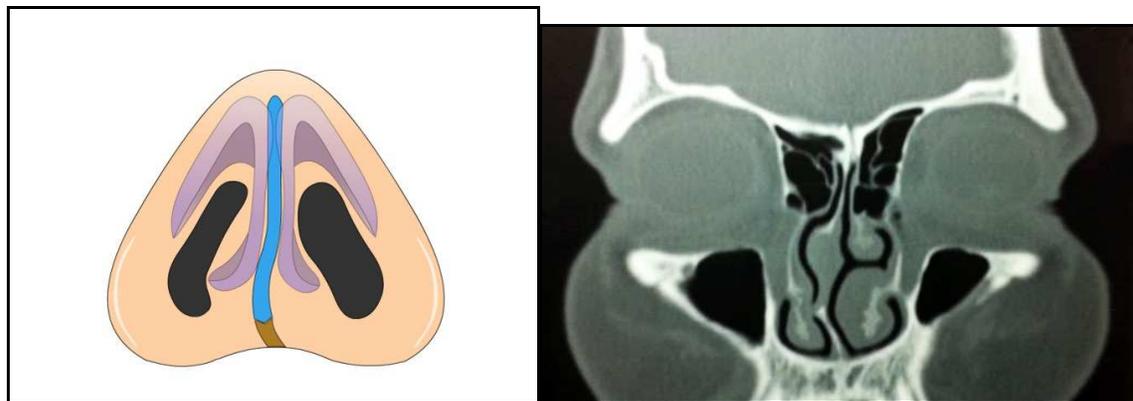


Figure 7. a, b) Deviation of the nasal spine that causes a slight deviation of the nasal septum, displacing the footplate of the alar cartilage, widening the columella.

In such cases, during surgery and with the individualization of the involved structures, the footplates of the alar cartilages tend to return to its usual position; however, the main pathology needs to be treated (septal deviation and/or nasal spine) and afterward the footplates of the alar cartilages have to be approximated by a stitch of transfixion.

NOTE: It is important that the described alteration (wide columella), regardless of etiology, can be solved with good results, the key to success is to make an accurate diagnosis, knowing the dynamics of the nasal tip, and choosing the appropriate surgical technique.

3. Surgical treatment of the wide columella through sutures

The suture between the feet of the lower lateral cartilages not only closes but stretches the base of the columella and improves the shape of the nostrils.

The lower lateral cartilages are the main suppliers of structural support of the nasal tip; therefore, any excess, shortfall, or alteration will directly affect not only the shape but also the position of the nasal tip.

It is important to note that the approximation of the footplates through sutures will not only produce the desired changes but will also trigger unwanted effects, if a thorough preoperative evaluation of the nose was not fully performed.

When suturing the footplates of the alar cartilages to approximate them, as mentioned above, we narrow the columella and improve the shape of the nostril; if there is a lot of soft tissue between them, a slight forward flow of the base of the columella (Fig. 8) will occur. Removing soft tissue between the footplates and the medial pillars before making the suture prevents such further protuberance on the columella when looking at the profile.

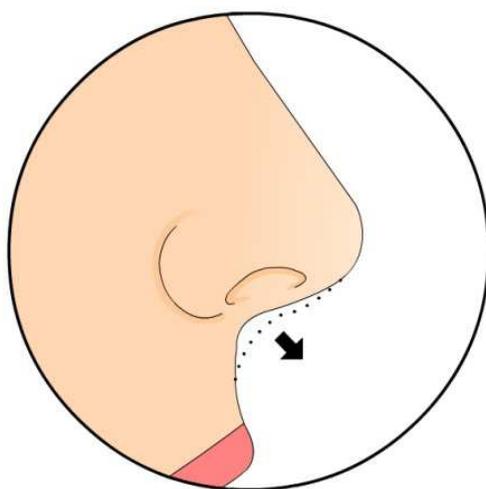


Figure 8. The dotted lines show the forward flow of the base of the columella after approximating the footplates of the alar cartilages by a stitch of transfixion.

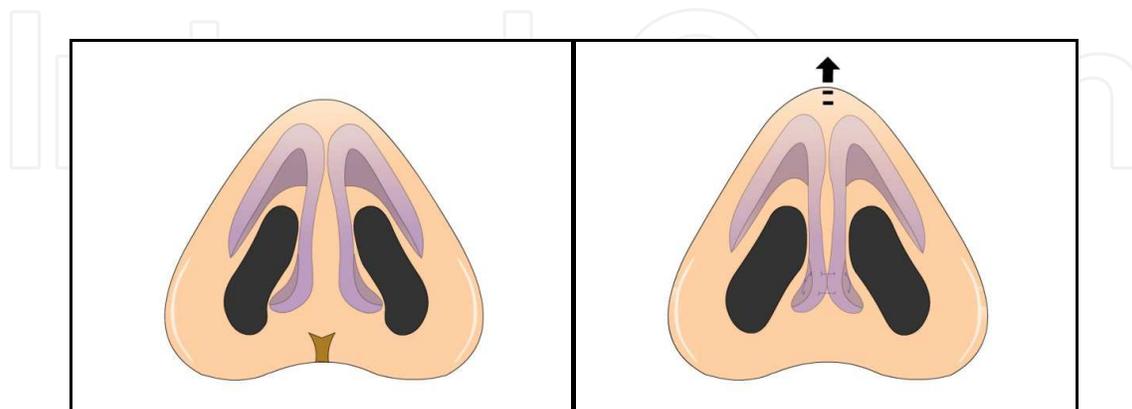
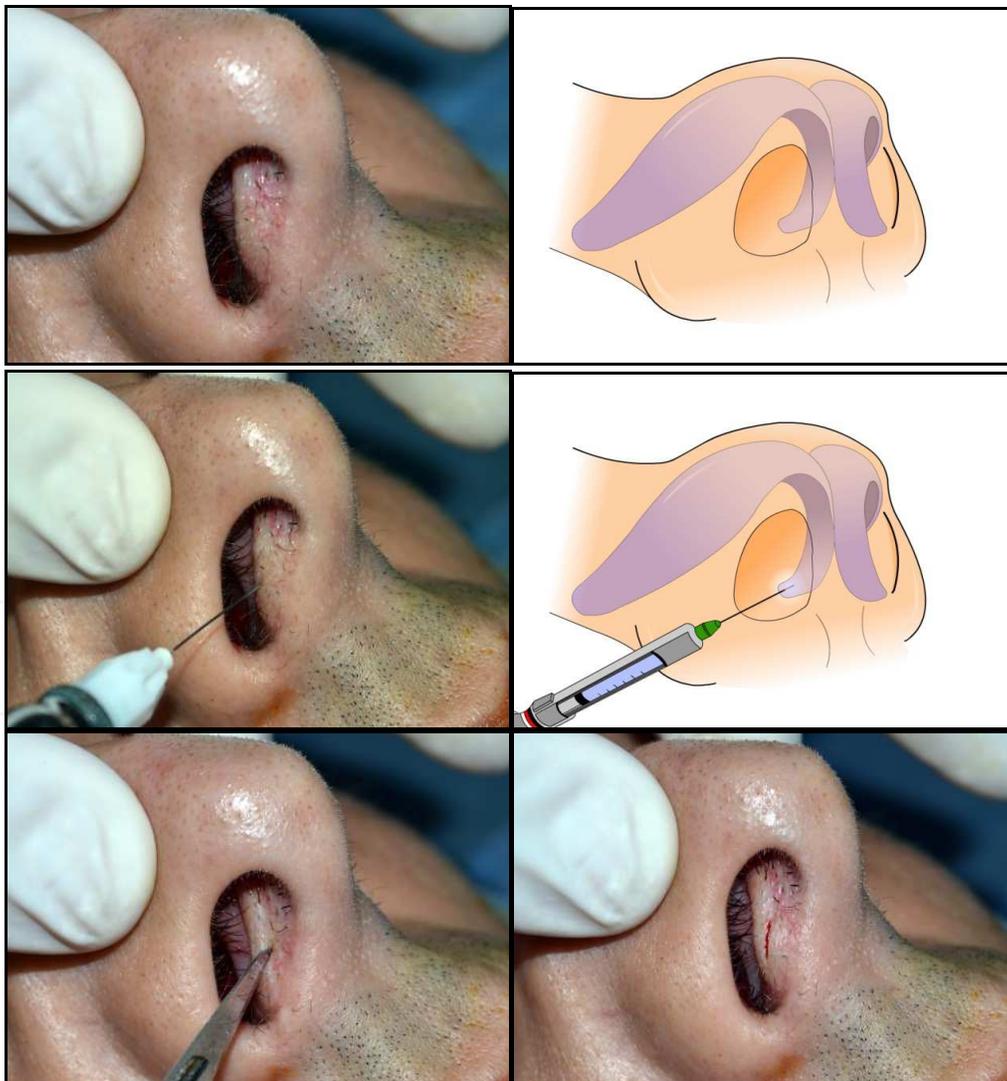


Figure 9. a, b) It is observed how the columella is refined and how the shape of the nostrils is improved through a transfixion stitch but also the nasal tip is slightly projected.

The approximation of the footplates will produce an increase of the tip projection, which means a positive effect if we have either a hypoprojected or normoprojected nose, but this is not a good suggestion if we are in presence of a hyperprojected nose (Fig. 9a,b), in which case you can resect a portion of the footplates and bring them closer with a stitch of transfixion.

3.1. Surgical technique

We infiltrate the membranous septum with 2% lidocaine with epinephrine 1:50,000; this way we produce analgesia, vasoconstriction, and a hydraulic detachment. Later on, with a scalpel blade # 11 we make an incision of no more than 3 mm above the membranous septum where the footplates protrude, and with curved Iris scissors we separate them from the mucous membrane and the soft tissue, then through a U stitch of transfixion with mononylon 4-0 we approximate them and close the 2 incisions made in the membranous septum with mononylon 6-0 (Fig. 10).



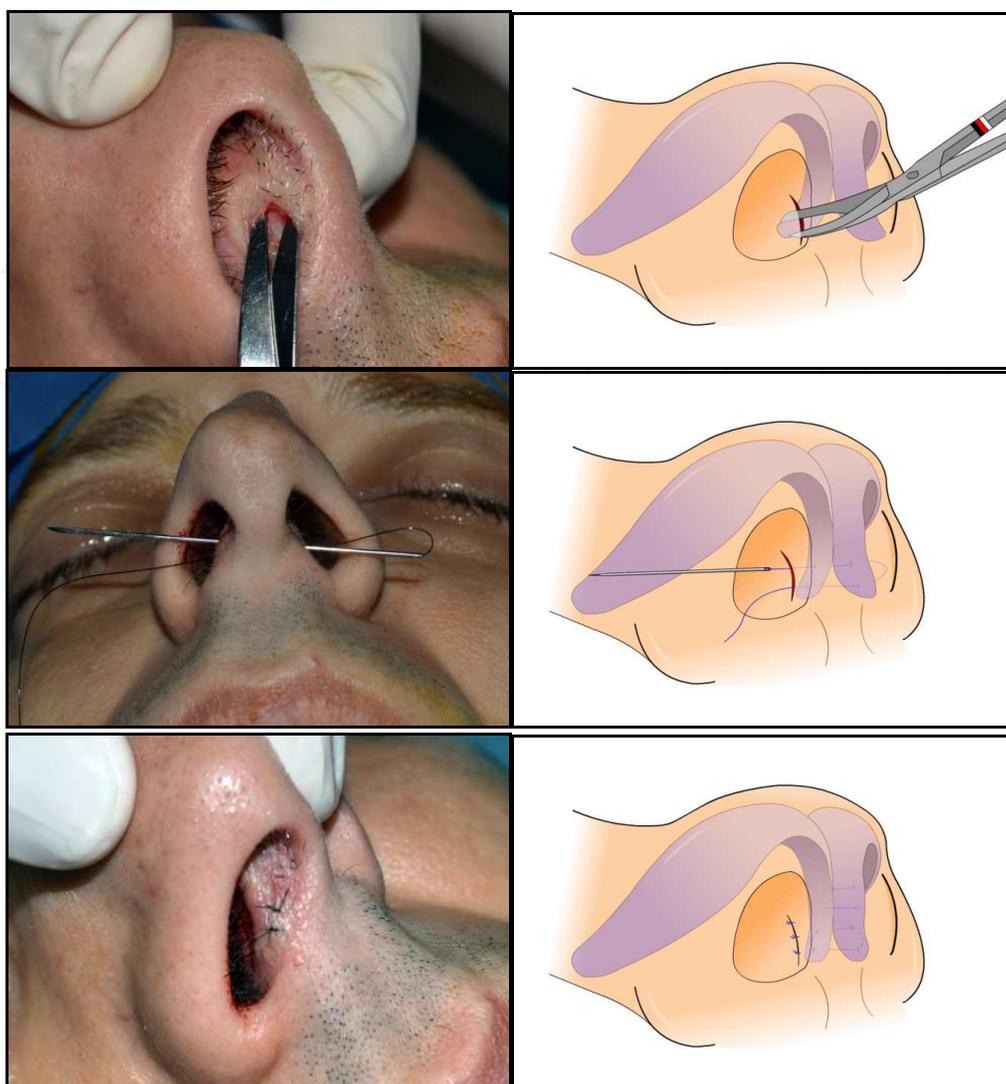


Figure 10. Surgical sequence where the approximation of the footplates is shown by a U stitch.

If necessary, we can add a second suture on the base to approximate the soft tissue (Fig. 11).

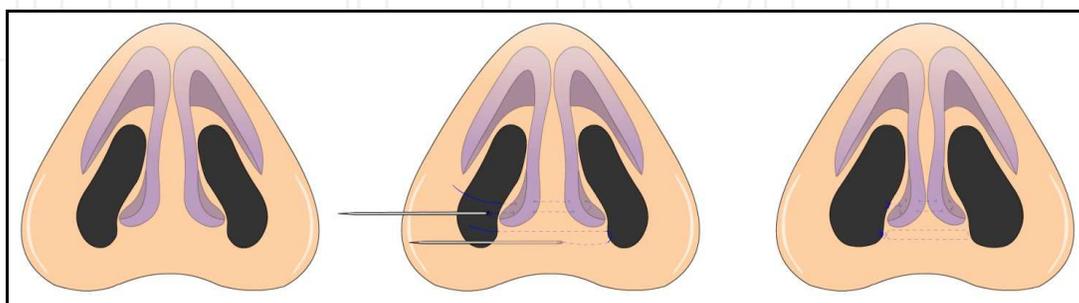


Figure 11. Surgical technique used for wide columella in cases where the footplates are divergent, symmetrical, and the nasal tip is hypoprojected or normoprojected, if necessary we add a second stitch of transfixion in the soft tissue to refine even more the columella.

4. Treatment of the wide columella by a resection of the footplates

The resection of the footplates of the alar cartilages is performed when these are asymmetric (a longer and/or more bent footplate) (Fig. 12a, b) or in case of divergent alar cartilages associated with a hyperprojected nasal tip (Fig. 13a, b), this way not only do we refine the columella and shape the nostril but we also accomplish a slight decline of the nasal tip.

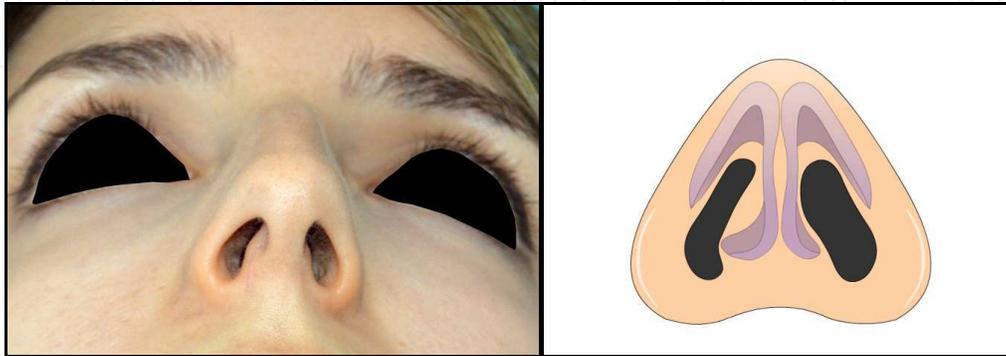


Figure 12. a, b) You can observe a wide columella; this is because the right footplate of the alar cartilage is more bent than usual.



Figure 13. a, b) You can observe a widened columella in the nasal base as a result of divergent alar cartilages. The nasal tip is hyperprojected when looking at the profile, which is why the ideal surgical technique is the partial resection of the footplates and its posterior approximation by a U stitch transfixion.

4.1. Surgical technique

An infiltration with 2% lidocaine with epinephrine 1:50,000 is performed between the membranous septum and the footplates of the alar cartilages and between the divergent footplate and the soft tissue. We make a small 5 mm incision in the membranous septum at the level of the footplates with a scalpel blade # 11 and later on with Iris scissors we squeeletize the divergent footplate of the alar cartilage (Fig. 14a, b). Note how in Fig. 15a, b, once the footplate is fully released it comes out easily. After that a portion of the footplate is resected with a sheet # 11 (Fig. 16a, b), then with a straight needle and a 4-0 mononylon the footplates are approximated

by a U stitch transfixion; we make hemostasis control and close the incisions with mononylon 6-0 (Fig. 17a, b, c).



Figure 14. a, b) Dissection of the footplates of the divergent alar cartilages with Iris scissors.

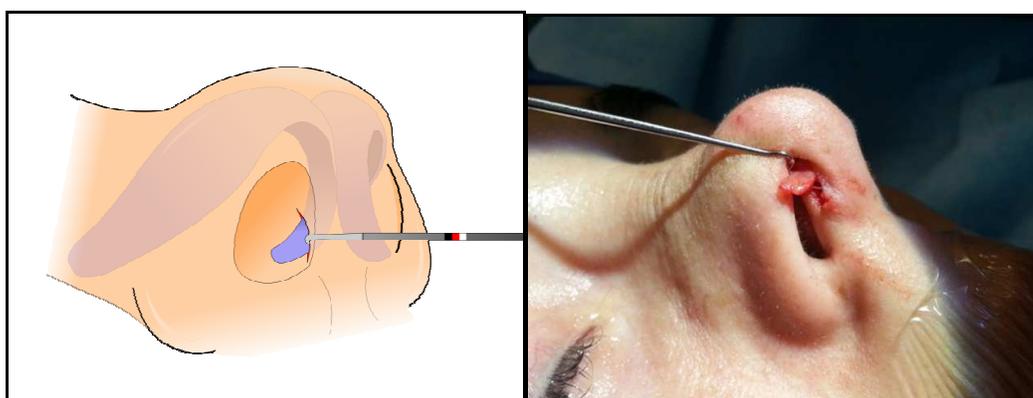


Figure 15. a, b) It is observed how once the footplates are fully released they are introduced into nostril.

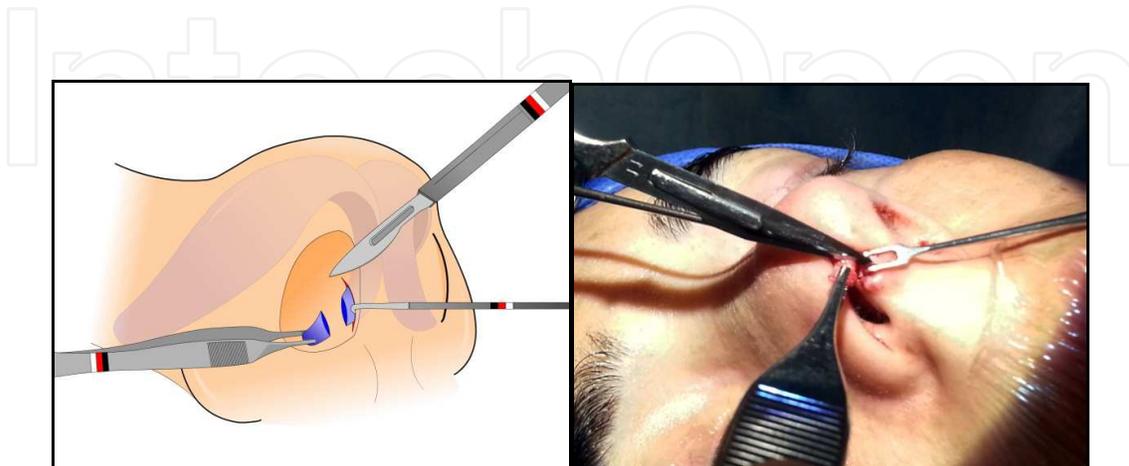


Figure 16. a, b) Resection of a portion of the footplates of the alar cartilage with a scalpel blade # 11.

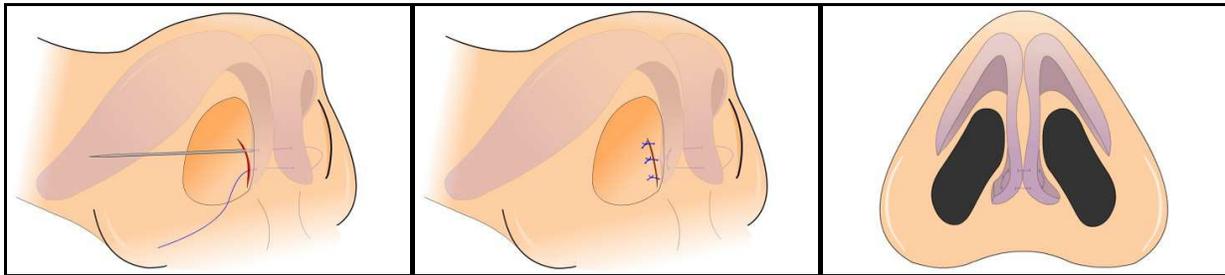


Figure 17. a, b, c) Making a U stitch of transfixion with mononylon 4-0 and closing the membranous septum with mononylon 6-0.

In the following figures two surgical cases are shown:

Case 1: For a 25-year-old patient having a wide columella as a result of divergent footplates of the alar cartilages, it is decided to resect a portion of the footplates of the alar cartilages as the patient presents hyperprojected nose and in this way a minimal deprojection is also accomplished (Fig. 18).



Figure 18. Pre- and postsurgical patient presenting divergent footplates.

Case 2: A 27-year-old patient shows at the examination of the nasal base a wide columella as a result of having a caudal septal deviation to the right and, consequently, this pushes the footplate ipsilaterally and protrudes into the nostril almost obliterating it completely (Fig. 19).



Figure 19. Dear Authors please add caption

The diagnosis is confirmed during surgery, where just by making a hemitransfixion incision on the membranous septum and releasing the nasal septum its caudal portion is deflected to the right (Fig. 20a, b). In this case, we center the nasal septum and join the footplates through point U of transfixion; in Fig. 21a, b, the pre- and postoperative photos are displayed.



Figure 20. Dear Authors please add caption



Figure 21. Dear Authors please add caption

5. Conclusion

In this article, we try to show the reader that the nasal base is an aesthetic component that is as important as the dorsum or nasal tip, but surprisingly it does not get the attention it deserves and also that with detailed preoperative analysis and surgical or simple minimally invasive techniques we can achieve a symmetrical and harmonious nasal base.

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Conflict of interest

The authors have no conflict of interest to disclose in relation to this article.

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