Spare Roof Technique: A Middle Third New Technique

Miguel Gonçalves Ferreira, MD1  Daniel Monteiro, MD2  Claudia Reis, MD1  Cecilia Almeida e Sousa, MD1

1 Department of Otolaryngology - Head and Neck Surgery, Hospital Santo Antonio, Porto, Portugal
2 Department of Otolaryngology, Hospital Vila Franca de Xira, Vila Franca de Xira, Portugal


Abstract

To our knowledge, the spare roof technique (SRT) is the first technique that is based on a complete skeletonization/preservation of the upper lateral cartilages. This technique is used to keep the natural roof of the nose's middle third, while dehumping and/or correcting the crooked septum. From January 2014 till March 2015, a total of 40 rhinoplasties were performed through the SRT: 28 reduction rhinoplasties, 6 complex crooked noses (with extracorporeal septoplasty), and 6 mixed cases. The SRT is an excellent middle third technique. The natural roof was kept and fitted the accurate new position in almost all cases with no surgical complexity. It is an easy technique with many applications and it is also very useful in the classical humpectomy of the Caucasian nose and correction of the crooked nose.

Methods

Study Design

From January 2014 to March 2015, the same surgeon (M. G. F.) performed 40 rhinoplasties using the SRT—23 (57.5%) females and 17 (42.5%) males, aged between 18 and 47 years (average: 25.6 years).

Keywords

► rhinoplasty
► humpectomy
► dehump
► upper lateral cartilages
► spare roof technique
30.6 years old). Open approach was used in 10 (25%) patients and close approach in the remaining 30 (75%).

SRT was performed with the following purposes: (1) dehumping in 28 (70%) patients; (2) correcting severe crooked nose (extracorporeal septoplasty) in 6 (16%) patients; (3) mixed (dehump and crooked) in 6 (15%) patients (►Table 1).

The brow-tip aesthetic line (BTL) is an imaginary line traced from the medial brow down the lateral wall of the nose to the tip-defining points. Typically it is considered in the frontal view, but it can also be considered in the three-fourths view; in this view the BTL is almost as sensitive as the profile view. To our knowledge, the BTL considered in the frontal and...
Spare Roof Technique

Ferreira et al.

Table 1 Main outcomes of the spare roof technique

<table>
<thead>
<tr>
<th>Spare roof technique</th>
<th>Total</th>
<th>Gender</th>
<th>Approach</th>
<th>Strategy</th>
<th>Mean follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1, very good</td>
<td>32 (80%)</td>
<td>14 (82%)</td>
<td>18 (78%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>brow-tip line</td>
<td></td>
<td>Open</td>
<td>Closed</td>
<td>Dehump</td>
<td>Crooked</td>
</tr>
<tr>
<td>G2, good brow-tip</td>
<td>6 (15%)</td>
<td>2 (12%)</td>
<td>4 (17%)</td>
<td>2 (20%)</td>
<td>4 (13%)</td>
</tr>
<tr>
<td>line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3, bad brow-tip</td>
<td>2 (5%)</td>
<td>1 (6%)</td>
<td>1 (5%)</td>
<td>1 (10%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>17</td>
<td>23</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

three-fourth views is the most accurate way to validate dorsal aesthetic surgery results of the nose (Fig. 5).

Patients were assessed through an average of 8.72-month follow-up (3–16 months follow-up) by two senior surgeons—direct and photographic validation. At the last follow-up visit, results were considered, concerning the BTL (frontal and three-fourths view), and patients were divided into three groups: G1 (very good BTL), 32 (80%); G2 (good BTL), 6 (15%); G3 (bad BTL), 2 (5%) (Fig. 5).

We have made no functional objective analyses, but the subjective outcomes from each patient corroborate our perception that there is an improvement in the function due to the gain of width of the nasal middle vault with this technique.

Surgical Technique

The SRT is designed to preserve the natural roof of the upper and middle third based on the old Cottle concept as the septum goes, so goes the nose. It can be performed with an open or close approach.

The first step consists of longitudinal cut of the dorsal septum (Figs. 1b, 4a), from the anterior nasal angle till the perpendicular plate of the ethmoid, 1 mm below the ULCs separating completely the dorsal aspect of the septum and the ULCs, preserving the union among the ULCs (Fig. 4a). After this step, the “roof” (i.e., ULCs) is attached to the nasal pyramid only by the lateral connections of the ULCs, cephalically by the attachment between ULCs/nasal bones and caudally by the attachments of the ULCs/LLCs.

The second step consists of removing the remaining excess of dorsal septum (from 1 to 5 mm, as needed) to enable the hump’s decrease as desired (Figs. 1b, 4b). This step should be carefully performed with 1-mm excisions at each time, till the desired result has been achieved. Dealing with the medium to severe crooked noses implies the quadrangular septum entire removal by performing an extracorporeal septrhinoplasty (Fig. 2). When performing extracorporeal septoplasty, the preservation of a 5-mm cartilaginous septum is done in the junction with the perpendicular plate of the ethmoid to allow fixation of the “new” septum. The other fixations with 4.0 PDS are done with the posterior septal angle/nasal spine (with a bony needle hole) and superiorly two stitches to the preserved roof (ULCs) (Fig. 4d).

The third step consists of releasing the junction among the nasal bones and the ULCs—undermining the nasal bones till the cephalic end of the ULCs (~7 to 10 mm above the caudal end of the nasal bones) (Fig. 3a). The cephalic portion of the ULCs always ends in the junction between the perpendicular plate of the ethmoid and the nasal bones.

The fourth step consists of suturing the “roof” (ULCs) to the dorsal aspect of the remaining or reshaped septum (Figs. 1d, 2d, 4d). When performing big hump reductions, there may be some flare effect that increases the width of the middle third (Fig. 3a). This “width effect” can be beneficial in some Caucasian thinner noses. When the width is too much, it happens in the caudal part of the ULCs and it can be solved with one of three options: morselizing/crushing the excess ULCs (Fig. 3b), with one suture from the excess cartilage/septum/cartilage (Fig. 3c), or control with triangular discharges (Fig. 3d).

At this stage, and since the “cartilaginous roof” is already dehumped, the fifth and final step is addressed only to dehump the bony part (Fig. 4e). This can be done with a traditional bony humpectomy with a Rubin osteotome plus...
Fig. 5  (a) Very good brow-tip line—G1; (b) good brow-tip line—G2 (in this case, slightly crooked in the middle third); (c) bad brow-tip line—G3 (in this case, there was an unacceptable crooked middle third/tip—patient elected for revision surgery).

Fig. 6  Pre- and postoperative (11 months). Nasal hump in a patient without tip surgery.

Fig. 7  Pre- and postoperative (13 months). Nasal hump, crooked nose, dropped tip.
lateral osteotomies or preserving the bony roof: two triangular osteotomies are done—wedge resections—around the nasomalar suture and then concluded with enough greenstick transversal osteotomies so that the remaining bony hump can be pushed down.

**Report of Cases**

The authors have selected three exemplificative cases:

**Case 1**

Eleven months post-op. Typical nasal hump in a patient who did not want any tip surgery. SRT, closed approach, transfixed septoplasty, non-delivery, without sutures ULCs/septum. Remaining bony hump removed by rasp plus lateral osteotomies (Fig. 6).

**Case 2**

Thirteen months post-op. Nasal hump, crooked nose, dropped tip without definition. SRT, open approach, with sutures ULCs/dorsal septum. Remaining bony hump removed by Rubin osteotome plus lateral osteotomies (Fig. 7).

**Case 3**

Ten months post-op. Nasal hump, smashed and crooked nose, dropped tip without definition. SRT, open approach, with sutures ULCs/dorsal septum. Extracorporeal septoplasty. Remaining bony hump removed by Rubin osteotome plus lateral osteotomies (Fig. 8).

**Discussion**

The SRT is a new technique used to approach the middle third of the nasal pyramid in rhinoplasty. It was designed to preserve the natural roof of the middle third based on the Cottle concept—as the septum goes, so goes the nose.

The middle third still remains as the most challenging segment to deal with in rhinoplasty. This technique provides a new tool to release the quadrangular septum and deal with it separately, following the surgeon’s needs and answering most of the surgical problems in this segment.

This study of 40 patients showed that this is a useful, reliable, easy, and refined technique to deal with the middle third, mainly in two kinds of noses: (1) noses with any kind of hump and (2) medium to severe crooked noses (in these cases, the author prefers the extracorporeal septoplasty as the election maneuver to use with the SRT).

Although this is a conservative technique, it involves the disruption of the osteocartilaginous junction (upper and middle third), and in some cases there is a need to place some diced cartilage to smooth camouflage in this transition.

Controlling the height is an easy step, by being able to cut the amount of excess dorsal septum, in a slow 1-mm fashion (step-by-step) decreasing until the perfect profile is achieved. Then two or three sutures (PDS 5.0) are placed through the ULCs and dorsal septum. The remaining bony hump should be addressed with a traditional osteotomy with Rubin osteotome (followed by lateral osteotomies), or two simple triangular osteotomies around the nasomalar suture and final transverse osteotomies to push down the bony hump. Controlling the width in big hump reductions, where some “flare effect” can happen, is achieved by triangular discharges and weakening of the ULCs or sutures (Fig. 3).

Controlling stabilization is an easy step with the sutures (PDS 4.0 or 5.0) to the dorsal septum: the lateral attachments are still there and are very strong. Controlling the “K” area is not a problem while dehumping. However, in the extracorporeal septoplasty, the “new” septum should be well sutured to the preserved roof, perpendicular plate of the ethmoid, and anterior nasal spine.

**Conclusion**

The SRT is a new conservative technique to approach the middle third of the nasal pyramid in rhinoplasty. It mainly addresses dehumping and correction of the medium to severe crooked noses.

It is an easy and reliable technique, with excellent short- and medium-lasting results. Although more studies are needed, this study demonstrates that it is an excellent technique. As a conservative technique, it can always be converted in the classical en bloc humpectomy or the split hump technique if the surgeon does not feel comfortable with it.

As far as we know, this technique has not been described before in the rhinoplasty literature. Nevertheless, this is a preliminary report and further research is required, mainly comparative studies, with larger groups of patients concerning long-term results/potential issues.
Conflict of Interest
The authors have no conflict of interests, including relevant financial interests, activities, relationships, and affiliations that could be perceived as having influenced this work.

Funding
There were no sources of funding or support.

Author’s Contribution
Miguel Gonçalves Ferreira was responsible for design, analysis, and interpretation, as well as writing of the manuscript; had full access to all the data in the study; and takes responsibility for the integrity of the data and accuracy of the data analysis.

Daniel Monteiro was responsible for analysis, interpretation, and writing of the manuscript.

Cláudia Reis and Cecilia Almeida e Sousa were responsible for writing of the manuscript.

References