INTRODUCTION
One of the most crucial components of success in rhinoplasty is the midline positioning of the nasal dorsum and the columella. Even a mild degree of postoperative deviation of the nasal dorsum and/or columella from the midsagittal plane could be enough to displease a patient. Postoperative judgment of the nasal dorsum and the columella positioning on the midsagittal plane is somewhat of a subjective decision determined by the surgeons’ naked eye. Most innovations tend to evolve from necessity. The risk and reality of misjudging the correct positioning for both the nasal dorsum and/or the columella led me to develop a device for the objective measurement of the midsagittal axis of the nose. I have called it the rhinoplasty setsquare device. This device is made from 316 quality stainless chrome. It is completely sterilizable. It consists of 4 main parts. During the finishing touches of the operation, the correct placement of the rhinoplasty setsquare device will provide the surgeon with an objective decision that will help make the positioning of the nasal dorsum and the columella more precise. When I conducted my research on literature and device catalogs for possible devices designed for measurement in rhinoplasty operations, I ran into devices such as the Castroviejo caliper, calibrated lateral crus stabilizer, Joseph measuring rod, and Thorpe Marchac caliper. All of them are unique in their function and design. However, as far as I could see, there is no device similar in form and function to my rhinoplasty setsquare device. I have been using this device for 8 months for all my rhinoplasty patients. I am more confident now in my postoperative results due to its objective measurement of the midsagittal line.

REASON OF NECESSITY
Postoperative judgment of the nasal dorsum and the columella positioning on the midsagittal plane is somewhat of a subjective decision determined by the surgeons’ naked eye. It is subjective because the only way to decide this positioning is just by meticulous observation and viewing of the nose through several planes of the patient’s head, mainly side views, front view, brow view, and chin view.
Subjective decisions which are made just by the naked eye may sometimes mislead the surgeon and may result in misjudgments regarding the precise positioning of the nasal dorsum and the columella, which will cause undesired results to some degree of postoperative deviations from midsagittal plane.

DESIGN AND UTILIZATION OF DEVICE
Most innovations tend to evolve from necessity. The risk and the reality of misjudging the correct positioning of both the nasal dorsum and/or the columella led me to develop a device that will provide an objective measurement of the midsagittal axis of the nose. I have called it the rhinoplasty setsquare device (Figs. 1, 2).

Summary: Even a mild degree of postoperative deviation of the nasal dorsum and/or columella from the midsagittal plane could be enough to displease a patient. Postoperative judgment of the nasal dorsum and the columella positioning on the midsagittal plane is somewhat of a subjective decision determined by the surgeons’ naked eye. Most innovations tend to evolve from necessity. The risk and reality of misjudging the correct positioning of both the nasal dorsum and/or the columella led me to develop a device for the objective measurement of the midsagittal axis of the nose. I have called it the rhinoplasty setsquare device. This device is made from 316 quality stainless chrome. It is completely sterilizable. It consists of 4 main parts. During the finishing touches of the operation, the correct placement of the rhinoplasty setsquare device will provide the surgeon with an objective decision that will help make the positioning of the nasal dorsum and the columella more precise. When I conducted my research on literature and device catalogs for possible devices designed for measurement in rhinoplasty operations, I ran into devices such as the Castroviejo caliper, calibrated lateral crus stabilizer, Joseph measuring rod, and Thorpe Marchac caliper. All of them are unique in their function and design. However, as far as I could see, there is no device similar in form and function to my rhinoplasty setsquare device. I have been using this device for 8 months for all my rhinoplasty patients. I am more confident now in my postoperative results due to its objective measurement of the midsagittal line.

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Rhinoplasty Setsquare Device: A Novel Instrument to Verify Columellar and Nasal Dorsal Position at the Midsagittal Line

Aret Çerçi Özkan, MD

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This device is made from 316 quality stainless chrome. It is completely sterilizable. It consists of 4 main parts. The first part is a combination of a ruler and an isosceles triangle (Fig. 1). The ruler is applied over the patient’s moustache region immediately below the nose. The notch over the ruler, which is located at its midpoint, is designed to ease the placement of the zero point exactly over the center of the Cupid’s bow of the upper lip (Fig. 1). The height of the isosceles triangle, which makes the 90-degree intersection with the midpoint of the ruler, creates a setsquare or T-square, which is the most crucial point used to verify the correct midsagittal axis of the columella, and this point has given this device its name (Fig. 1). The sides of an isosceles triangle are 55 mm long and the base is 60 mm long (Fig. 1). I have achieved these particular optimal lengths by making different triangles out of cardboard. The word “optimal” is being used to indicate rough judgment of the symmetry of the alar wings.

The second part of this device is a simple plumb line and bob, which points the ruler (Fig. 1). When the patient’s head is placed exactly on the midsagittal plane while lying in supine position without any tilt on the neck, and when the plumb line is at the midpoint of the ruler, the ruler is parallel to the transverse plane of the patient’s head and the height piece of the isosceles triangle is exactly on the midsagittal plane, enabling the surgeon to objectively decide the axis of the columella.

The third part of this device is a straight rod, which rests over and just a few millimeters above the nasal dorsum (Fig. 2). That is why it is called the dorsal part of the device. This rod verifies the positioning of the dorsum at the midsagittal line when it cephalically passes through the center of the intercanthal line. Again, I have decided the length of the dorsal part to be 95 mm by way of several trials in order for it to fit to all faces (Fig. 2).

The fourth and the last part of this device is the forehead part, designed to stabilize its placement (Fig. 2). This part is freely placed over the forehead.

I have designed this device mainly for utilization during operation. I use this device before starting the operation to verify my previous clinical assessment related to any existing deviation of the columella and the nasal dorsum. First, I place the notch of the ruler over the midpoint of the Cupid’s bow and position the dorsal part of the device over the midpoint of the intercanthal line. Also,

Fig. 1. Isosceles triangle, ruler, and plumb line of the rhinoplasty setsquare device. A, Two edges of isosceles triangle. B, Height piece of isosceles triangle. C, Plumb bob. D, Ruler. E, Notch of the ruler.

Fig. 2. The ruler, dorsal part, and forehead part of “rhinoplasty setsquare device.” A, Ruler. B, Dorsal part. C, Forehead part.

**Preoperative Assessment**

**Video Graphic 1.** See video, Supplemental Digital Content 1, which displays preoperative, perioperative, and postoperative utilization methods of “rhinoplasty setsquare device.” This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com or available at [http://links.lww.com/PRSGO/A468](http://links.lww.com/PRSGO/A468).
I take into consideration the correct midline stance of the plumb (see video, Supplemental Digital Content 1, which displays preoperative, perioperative, and postoperative utilization methods of the rhinoplasty setsquare device. This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com. http://links.lww.com/PRSGO/A468). Then, I use it again in the middle of the operation. Although the patient’s head is tilted toward the surgeon during the operation, it is still possible to use the device without plumb just by gently pressing the ruler to the lower borders of both alar wings. It still does its job. In other words, when the ruler is finely adjusted just over the end points of the 2 alae while the tip of the notch of the ruler is pointing to the center of the Cupid’s bow of the upper lip, it is again possible to judge the midsagittal line. Here, we can disregard the position of the patient’s head and the position of the plumb line. This is the easier way to use this device (Supplemental Digital Content 1). But, of course, here the surgeon should be confident about the symmetry of alae and the maxilla. When there is any doubt about the symmetry of the columella or the nasal dorsum during the operation, almost always I check the accuracy with this device. The next time I use this device is toward the end of the operation right after placing the first columellar suture. First, I reposition and correct the tilt of both the operating table and the patient’s head back to its preoperative straight position. Once again I place the notch of the ruler over the midpoint of Cupid’s bow and place the dorsal part of the device over the mid-point of the intercanthal line and also I consider the correct midline stance of the plumb (Fig. 3; Supplemental Digital Content 1). If there is any mismatch between the

Fig. 3. Application of the device after placement of first columellar suture. A, Chin view. B, Dorsal view.
columella and/or the dorsum with the alignments of the device, I immediately remove the columellar suture and try to search for the cause. Use of this device a month after the operation or even a day after the operation may make sense for scientific reasons, but unfortunately will not help the surgeon and the patient; even if you detect a problem after leaving the operating table, you cannot go back and fix it. That’s why this device should mainly be used during the operation and can partially be used at the office for preoperative judgment.

During the finishing touches of the operation, the correct placement of rhinoplasty setsquare device will help the surgeon make an objective decision that will help to verify the positioning of the nasal dorsum and the columella more precise. Also, 2 edges of the isosceles triangle will help the surgeon make a correct judgment for the symmetry of the alar wings. If a mismatch exists between the device plans and the columellar and/or nasal dorsum plans, it would be wise to reconsider the postoperative result at the operating table (Fig. 3).

Facial asymmetry unfortunately constitute a major challenge for postoperative results of the rhinoplasties. As the rhinoplasty setsquare device is positioned with the guidance of 2 anatomic landmarks, namely the midpoint of the cupid bow and the midpoint of the intercanthal line, any shift of the lip toward one side due to facial asymmetry somewhat ruins the utilization of this device. Positioning it on a patient with facial asymmetry will unfortunately cause oblique placement of the dorsal part of the device. Thus, the positioning will be over the nasal plane, not the midsagittal plane. However, as the lower hinge of the device is very firm, the ruler part will also be affected from this oblique tilt of the dorsal part and will not stay parallel to the upper lip. This will provide the opportunity for the surgeon to recognize the presence of facial asymmetry if it was otherwise unnoticed before. Therefore, the surgeon will have the opportunity to explain the situation to the patient preoperatively. If the facial asymmetry is due to different heights of the maxillae, the use of the rhinoplasty setsquare device will not be affected because if the plumb shows zero point over the ruler, the ruler will be exactly on transverse axis, regardless of the asymmetry of the maxillary heights.

Of course, there will be several cases where late postoperative deviations may happen. Most of them are related to poorly corrected nasal septum, unrecognized asymmetries of the lower lateral cartilages, displacement of columellar strut graft, and so on. The rhinoplasty setsquare device is unfortunately ineffective for detecting these types of late emerging problems.

Intraoperative edema may be thought as another problem that may complicate the use of the device by obscuring the deviation. However, intraoperative edema may obscure depressions and protrusions caused by the surgeon over the nasal dorsum and the tip during the operation. I personally do not believe that edema could obscure deviation of the dorsum and/or the tip. Also, intraoperative edema is not a very likely outcome of today’s medicine due to the help of intravenous steroids and adrenaline solution, lowered intraoperative blood pressure, fine surgical devices and techniques, sterile ice cubes, and so on.

**SIMILAR DEVICES IN LITERATURE AND CATALOGUES**

When I conducted my research on literature and device catalogs for possible devices designed for measurement in rhinoplasty operations, I saw the Castroviejo caliper, calibrated lateral crus stabilizer, Joseph measuring rod, and the Thorpe Marchac caliper. All these devices are unique in their function and design; however, as far as I can see there is no device similar in form and function to my rhinoplasty setsquare device.

**CONCLUSIONS**

I have been using this device for 8 months on all my rhinoplasty patients. I have redesigned some of its parts according to necessity. Now, it has become a very useful tool in my practice. I am more confident in my postoperative results due to its objective measurement of the midsagittal line.

A prospective clinical study for the scientific evaluation of the data obtained from this device is in progress. I have already started to collect data by measuring and comparing the preoperative deviation angle versus immediate and late postoperative corrected angle between the columella and the midsagittal line. Nevertheless, I need considerable time to discuss these types of results. When I align the height of the triangle, part of the device with the preoperatively deviated columella, the plumb moves some degree over the ruler to the same side of the columellar deviation and plumb bob denotes certain millimetric deviation from zero point. The length of deviation divided by the length of the height of the triangle will be the tangent value of the deviation angle. Thus, the angle of deviation can be calculated using this method.

It might have been possible to add a more sophisticated plumb line mechanism, such as a bubble level or an electronic plumb line, but the need for sterilization hinders such restorations.

The setsquare and the plumb have been used by architects and engineers since ancient times, and their use is still relevant today in checking the straightness of building columns and walls. This was my ultimate inspiration as I designed this device. I strongly believe that the columella and the nasal dorsum deserve the same precision and objectiveness that the building column or the wall has.

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