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Original Article

Comparison of suture and vertical dome division techniques of bulbous nose refinement

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Abstract

Objective: In this study, we assess long-term effects of vertical dome division (V.D.D) and Suture techniques in patients with bulbous nose deformity and then compare the efficiency of these methods.

Patients and Methods: In this study 70 patients with bulbous nose deformity were divided into two equal groups of A and B in which group A with suture (transdomal and interdomal) technique and group B with VDD technique underwent surgery to correct the deformity.

Results: Among the 35 patients, two patients in group A (7.5%) have a previous bulbous nose deformity remained stable of whom one patient resulted in revision surgery. Nasal tip over narrowing was not observed in this group. The overall satisfaction rate in this group of patients was approximately 92%. Of 35 patients in group B, who underwent surgery using VDD method eight months after surgery in all patients widening of nasal tip was reduced, but another complication as over narrowing nasal tip was observed in three patients (6.8%) which in one case this led to revision surgery and in one case (2.8%) collapse of Lower lateral cartilage (LLC) occurred. The overall satisfaction rate in this group was approximately 86%. There was no significant difference regarding satisfaction rate between these two study groups.

Conclusion: There are no significant differences between these two methods' results in terms of over- narrowing in nasal tip. In VDD method the dome can be narrowed to a higher level Compared with suture technique. Nondestructive methods such as suture both aesthetic and functional issue are little.

Key words: Vertical dome division (VDD); Suture techniques; Bulbous nose; Deformity

1. Introduction

Rhinoplasty is a common and popular surgery that a lot surgeons practice but only a few of them have complete mastery over its all subtleties¹. Amongst all aspects of rhinoplasty, tip is considered to be one of the

most complicated and controversial areas which is paid special attention to due to its aesthetic importance. A number of tip deformities are described so far that bulbosity in tip is one of them.

Bulbous nose is used for patients whose nose tips are similar to a ball². Nasal tip in this deformity looks

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wide. The space between the two domes related to lobule is wide and projection little and looks round. It is also likely that a large divergent angle exists between the two middle crura in lower lateral cartilages (LLC) which is measurable greater than 30 degrees³. The tip defining point is the most prominent point in every dome and it is a criterion for measuring the distance between the two domes. According to Adams Rohrich's definition³⁻⁴, the distance between these two points is about 5-6 mm and in cases where it is above 6 mm, nasal tip will look wide and is considered to be bulbous tip and based on this distance different surgical operations are required⁴⁻⁸.

There are a variety of tissues within the fining points that can be influential in over-widening of tip; of which superficial musculoaponeurotic system, ligaments and fat can be named². Among from other effective factors in the formation of bulbous nose we can refer to thick skin of the tip which is one of the difficult cases in tip surgery. In general, the most widespread reason for bulbous nose is mostly because of the large divergence between medial cruras in either side and also the huge width in domal arch or a mix of these mechanisms⁹. The accurate recognition of abnormal anatomic deformity and after that selection of the most suitable operation method is the first steps in correction of this deformity. A variety of operation methods for correction of bulbous nose exist of which suture and vertical dome division (V.D.D) can be mentioned².

The VDD is one of the most effective techniques in the correction of bulbous nose in which a cut is made on the lower lateral cartilages (LLC) between the dome (the most anterior projecting point of the lateral crus) and the angle created between lateral and medial crus. V.D.D was first defined by Goldman in 1957 in which the cartilage on the outer side of the dome is cut and then the edges are symmetrically sutured to form a favorable profile without the help of graft or implant¹⁰. A simple, predictable method for narrowing the interdomal space is suture technique¹¹⁻¹². The suture technique was first described in early 20th century. Joseph is the first person whose suture technique was entered articles as interdomal, which are used to sustain remaining LLCs after extraordinary resection and their sculpturing. In 1985 Mc Cullough and English¹³ described the double dome technique in which a mattress suture is crossed through external and middle crura on either side. Afterwards, Tebbets¹⁴ and Daniel¹⁵ described several kinds of tip sutures, particularly interdomal. Interdomal

suture results in the two domes to approach each other and corrects non-symmetrical tip and transdomal suture results in the arch of domes to get thinner by pushing the external crura to medial. By using this method increase in projection can be obtained. Usage and applications of these sutures are versatile and can be used to correct a number of deformities¹⁶. So far, different researchers have conducted plenty of research on each of these techniques separately but a unanimous study and comparison between these two techniques is something that has not done much.

In this study, we assess long-term effects of VDD and Suture techniques in patients with bulbous nose deformity and then compare the efficiency of these two methods.

2. Patients and Methods

In our study, 70 patients with bulbous nose deformity divided into two groups who underwent a septorhinoplasty surgery with suture (group A) and VDD (group B) techniques and then we analyzed the results of these two techniques eight months after the operation. All of 70 patients selected from all referred patients for septorhinoplasty to Imam Khomeini Hospital of Ahvaz Jundishapur University of Medical Sciences were included in our study from January 1, 2009, through August 31, 2010. In all selected patients the distance between two defining points was over 6mm and maximum 10 mm. There were 52 women and 18 men (mean age, 27.3 years) and divided into two groups (A & B) with 35 members in each group. Group A, was operated by suture technique and group B with VDD technique. All procedures were performed by using an open septorhinoplasty technique. Working on LLCs must be done with great caution to avoid unwanted damage to them. Two ways can be used to reach these cartilages. First through internasal delivery (close method) and the other open rhinoplasty. In this study we use open rhinoplasty because using this technique tip cartilage group can be exposed in a completely healthy, natural and anatomic way and work on them in a controlled way. After general anesthesia, 0.5% lidocaine mixed with 1:200,000 epinephrines is injected in the septum and tip. We wait for 5 to 10 minutes and then the incision is made in a V shape and in both sides of the alar margin in midclumella region. After flap dissection of nose work is

first done on dorsum and septum (Septoplasty, if needed). Tip refinement is done after these procedures.

Smoothly and with great care we undermine the vestibular skin from lobule. After that and before Suture or VDD we mark the defining points on each dome. In the next phase we do trimming in the cephalic section of LLCs in which at least 6 mm of each LLC must remain. This is to improve tip definition without dismantling their anatomical structure. So far, the technique used in both groups is similar.

After the above-mentioned procedures, work continues with interdomal and transdomal suturing techniques in group A. The process is that the needle is first crossed through the middle of the dome towards lateral and then from lateral re-entered and tied as mattress and in the direction of cephalic; this is called "transdomal mattress suture". Through this suture, domal arch is narrowed and lateral crura also moves towards medial which will result in improvement of deformity and formation of the natural shape of the dome and as a result that of the tip. When the ties in medial are done to the dome, suture leaves with a long lead. If necessary and in case of long distance between medial crura the angle can be reduced by tying these two sutures (interdomal suture). As a result the distance between the two domes is shortened which will result in refinement of the nasal tip. It is to be noted that the sutures are 5-0 monofilament nylon sutures.

In group B the tip is also evaluated after the aforementioned common procedures. The apex of domal cartilages and the place and size of narrowing in each LLC are determined as well. Vestibular skin is thoroughly dissected from under the cartilage to avoid any damage to it when cutting the cartilage. Then in the width of the apex of the dome of cephalic a cut is made to caudal margin so that to cover all the thickness of the cartilage with great care about the vestibule skin. After that, considering the size of deformity of lateral and medial parts are overlapped and fixed in the appropriate place by suturing. The technique is in a way that a 5-0 permanent mattress suture is crossed through the medial and lateral crura in parallel with the cut line and its tie gets hidden in the vestibular area. In the end and in both groups of A & B, a clumellar strut is prepared to strengthen medial crura and after final assessment tip definition, nose skin returns to the original place and sutures.

3. Results

In this study, 70 patients with bulbous nose deformity were studied for open septorhinoplasty surgery. These patients were divided into two equal groups of A and B in which group A with suture technique and group B with VDD technique underwent surgery to correct the deformity. All patients were followed up for eight months after the operation. It should be noted that none of these patients had no previous history of surgery septorhinoplasty.

Among the 35 patients in group A who underwent surgery using suture technique after eight months from the surgery in two patients (7.5%) previous bulbous nose deformity remained stable of whom one patient resulted in revision surgery. Nasal tip over narrowing was not observed in this group of patients (Figure 1). Breathing disorder did not occur in any of them either. The overall satisfaction rate in this group of patients was approximately 92% (Figures 2 and 3).

Of 35 patients in group B who underwent surgery using VDD method, 8 months after surgery on the contrary to suture technique in all patients widening of nasal tip was reduced, but another complication as the over-narrowing nasal tip was observed in three patients (6.8%) which in one case this led to a revision surgery. Also among 35 patients in group A in one case (2.8%) collapse of Lower lateral cartilage (LLC) occurred after eight months of operation and thereby the air flow passing into the nose was affected in this case, the result of which was revision surgery. The overall satisfaction rate in this group was approximately 86%.

Comparison of the results related to the remaining widening of nasal tip for two suture and VDD methods were ($p=0.64$) revealed there is no difference regarding this specific variable statistically between these two study groups (Table 1). The over-narrowing results in nasal tip of suture and VDD methods were studied by the fisher exact test. There are no significant differences between the results of these two methods in terms of over-narrowing in nasal tip ($P=0.23$) (Table 2).

4. Discussion

In this study, 70 patients with bulbous nose deformity were studied. Patients were divided into two equal groups of 35, A and B. Both groups underwent

open septorhinoplasty surgery. To correct aforementioned deformity in patients of group A Suture technique which is regarded a non-destructive method was used and VDD method which is considered to be a destructive method was applied for group B. The patients then were followed up for eight months after the operation^{2,17}.

Suture is a non-destructive method and helps maintain the context and integrated structure of cartilage which is helpful in the formation of the tip and vestibule. Using this way, each side of the dome can be narrowed down to a limited extent and as a result the tip can also be narrowed down to a certain level and as the results of our research show for two patients whom this method was used after eight months there still existed widening of the nasal tip. Although this rate with the VDD group all cases the deformity was corrected was no statistically significant difference in any case but this article reminds that in VDD method the dome can be narrowed to a higher level. VDD Method is destructive and as a result cartilage scaffold gets damaged and elasticity characteristic of the cartilage is lost in the place where it is cut. However, using this technique more severe changes in the tip can be made and reduce the width of the tip more which the results of the study prove them as well. On the other hand, in all patients in group B not only the width declined, but in three cases also reduction exceeded and led to over-narrowing nasal tip. Even in a patient another LLC collapse occurred. These two recent cases can be attributed to destruction in cartilage structure in a way that the cut on LLC in the dome region destroys its integrity and over time due to the loss of elasticity in this area, after a while cartilages sleep with each other and therefore over-narrowing in the nasal tip and sometimes collapse may occur as unwanted effects. While in Suture method due to the maintenance of cartilage integrity and its elasticity characteristic, the possibility of such complications reaches to a minimum which is our target as well.

Although there was no statistically significant difference between the two study groups but in any case, as these effects are likely to occur paying attention to them is of utmost importance since nose is in the center of attention in anybody's face and any roughness and non-symmetry in it will immediately attract the attention of others. Study convention, also in 2009 in Korea⁷ in 29 females and 34 males with a deformity bulbous nose the technique of suture to correct the deformity was used.

The results are somewhat similar to this study as in three patients wide over-tip still existed after a relatively long period of time. the results of this study are evidences of the results of our study.

In another study conducted in 2005 and 2006 in Brazil¹⁸ on patients with widening of nasal tip, in two groups of patients VDD and Suture were used in which in 5.3% of patients after 1.5 years the tip width was too much, but unlike our study over-narrowing the nasal tip was not observed. Due to the fact that the collapse of LLC disturbs air flow through the nose, in 2000 a study was carried out by Conrad et al.¹⁹, in which they studied this effect after VDD technique was used and they came to this conclusion that VDD is an effective method in tip surgery and despite the correction of the dome and its width in a desired way, it causes no disorder in air flow through the nose which these findings contrast the results of our research because in one case one of the patients who had gone under VDD surgery, LLC collapse occurred. In another study in China⁹ in 2008, VDD method was used in 137 patients of whom 64 were followed up for one year and eventually the effects of this method of tip surgery was observed in 13% of the patients which confirms the results of our study.

Tip over-narrowing and LLC collapse were occurred in VDD method in a follow up done after eight months which as mentioned before might have caused due to the cartilage overlapping made by cutting it using this method in which instead of two defining points the tip of the nose appears like a narrow prominence which gives an unpleasant image of the nose regarding aesthetic features. But in Suture technique, comparing short-term and long-term results of this method in bulbous nose deformity correction it was made clear that after eight months the existence of this deformity in two patients might be due to the cartilage elasticity. In a way that over time the cartilage reactionary force especially in the dome area overcomes the force by the suture to narrow down the area and as a result leads to the return of deformity in these two patients.

5. Conclusion

In surgeries done on the nose, especially in aesthetic surgeries, efforts should be made to maintain the integrated structure of cartilage and as much as possible avoid manipulation and unnecessary cuts on the

cartilage. In Suture technique, due to its non-destructiveness and minimum cartilage manipulation better results were obtained in the long term. It is recommended to apply VDD as the initial surgery method

in sever deformities which cannot be corrected using Suture technique.



Figure 1. Preoperative and postoperative photographs demonstrating reduction of tip widening and improvement in tip symmetry after use of transdomal and interdomal suture.



Figure 2. Preoperative and 8 months postoperative photographs of a patient who underwent cephalic trim, transdomal and interdomal suture.



Figure 3. Preoperative and postoperative photographs demonstrating correction of bulbous nose deformity after vertical lobule division

Table1. Comparison of nasal tip widening between the two study groups

Technique	Reduced width	Non-reduced width	Total
Suture	33(94/3%)	2(5/7%)	35(100%)
VDD	35(100%)	0(0%)	35(100%)

Table2. Comparison of over-narrowing in nasal tip in the two study groups

Technique	Overnarrowing is made	Overnarrowing is not made	Total
Suture	0(0%)	35(100%)	35(100%)
VDD	3(8/6%)	32(91/4%)	35(100%)

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