Comparative Columellar Scar Analysis Between W Incisions and Inverted-V Incision in Open Technique Nasal Surgery

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Abstract A visible scar on the columella is undesirable result for both patient and surgeon. So it is one of the major disadvantage of open nose surgery. Different columellar incision types have been used in open technique of nasal surgery. In this prospective study, we compare W incisions and inverted-V columellar incisions with a scar assessment scale. In this prospective randomized study, open nasal surgery (open rhinoplasty and open technique septoplasty) were performed on 93 patients between November 2009 and July 2012. The inverted-V incision was used on 31 patients (24 males, 7 females). The “W” incision was used on 62 patients (40 males, 22 females). The entire surgical procedure was performed by a single surgeon. The columellar incision was closed using 6–0 interrupted polypropylene sutures. All sutures were removed on the seventh postoperative day. Scars were assessed at 6 months, with 3 items scar assessment scale, we observed satisfactory scar, pigmentation, and notching. We compared both groups and found that the scar pigmentation, notching and scar formation are similar to each other. As a result of this

study we concluded that the inverted-V incision or “W” incision might be a similar choice in open nasal surgery.

Keywords Open rhinoplasty · Columellar scar analysis · Open technique nasal surgery

Introduction

Septoplasty and rhinoplasty are common operations in otorhinolaryngology. Rhinoplasty and septoplasty can be performed using both open and closed approaches. Transcolumellar incision open and closed approaches have been employed in rhinoplasty and septoplasty surgery to date. Both of open and close technique for nasal surgery are widely used by surgeons. Each technique has its own advantages and disadvantages. A visible scar on the columella is still one of the major disadvantages of open technique of nasal surgery [1]. A significant number of surgeons never use open approach rhinoplasty because of the risk of an undesirable scar on the columella [2]. In open nose surgery, many surgical incision techniques have been employed to obtain a better postoperative scar. Surgeons who prefer the open nose surgery technique use several different transcolumellar incision designs such as transverse, Z, V, W, and inverted V [3–6]. In this study we compared the scar quality between the W incisions and inverted-V incisions in patients who underwent open rhinoplasty and open technique septoplasty.

Patients and Methods

This is a prospective randomized study in a tertiary referral center with the approval of the local institutional Ethics Committee. All volunteers were provided with information

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about the procedures, and written informed consent was obtained before the study. In study, open rhinoplasty and open technique septoplasty were performed on 93 patients (64 males, 29 females) between November 2009 and July 2012. None of these patients had complaints about the scar on the columella. The entire surgical procedure was performed by a single surgeon. Study included primer surgery. Patients were randomized by use of a coin toss to undergo “W” or inverted V incision. The markings for the columellar “W” and inverted-V incision were as shown in Fig. 1. The columellar incision was closed using 6–0 interrupted polypropylene sutures. All sutures were removed on the seventh postoperative day.

The inverted-V incision was used on 31 patients (24 males, 7 females). The “W” incision was used on 62 patients (40 males, 22 females). Evaluation of 12 megapixels photographs of patients 6 months after surgery was made at a 1:1 scale. Scars can be defined by their contour, color, shape, dimension, and orientation following natural lines of strength of the skin, texture, and extensibility.

The Burn Scar Index, often called the Vancouver Scar Scale and Manchester scar scale are widely used in clinical practice and research to document change in scar

appearance. To date, Vancouver Scar Scale is the most widely used rating scale for scar [7]. We used a scar assessment scale (Table 1) using the Vancouver scar scale and the Manchester scar scale to analyze columellar incision scars in open nasal surgery [8, 9]. With this assessment scale we observed satisfactory scars, pigmentation, and notching. The t test was used for statistical analysis.

Results

Satisfactory scar was in W incision grup 74.2% (n = 46) excellent, 25.8% (n = 16) good; in inverted V incision grup 77.4% (n = 24) excellent, 22.6% (n = 7) good. ($p = 0.932$; $p > 0.05$). Pigmentation was in W incision grup 85.5% (n = 53) excellent, 9.7% (n = 6) good, 4.8% (n = 3) poor; in inverted V incision grup 90.3% (n = 28) excellent, 9.7% (n = 3) good. ($p = 0.667$; $p > 0.05$). Notching was W incision grup 90.3% (n = 56) excellent, 9.7% (n = 6) good; in inverted V incision grup 93.5% (n = 29) excellent, 6.5% (n = 2) good. ($p = 0.714$; $p > 0.05$).

Columellar scars of patients were independently analyzed by two surgeons using scar assessment scale.

Fig. 1 W incision, Inverted V incision. Points A and D are the narrowest parts of the columella. B and C are 2 mm above Point A and D. Point 2 is the middle of Points 1–3. Point 4 is 2 mm above Point 2, the middle point B–C and the upper part of the inverted V. Points 1 and 3 are the middle points of A–2 and 2–D and the base of the inverted V

Table 1 Columellar scar assessment scale

	1	2	3
Satisfactory scar	Excellent Cannot identify at 2 m distance	Good Can be weakly identified at 2 m distance	Poor Can be identified at 2 m distance
Pigmentation	Excellent Patient's normal skin color	Good Pigmentation in scar	Poor Hyperpigmentation
Notching	Excellent No notch on columella and rims	Good Notch on columella or depressed scar	Poor Notch on rims and columella

Table 2 Comparing of W and Inverted-V incisions

	Incisions		<i>p</i>
	W (n = 62) n (%)	Inverted V (n = 31) n (%)	
Satisfactory scar			
Excellent	46 (74.2%)	24 (77.4%)	0.932 ^a
Good	16 (25.8%)	7 (22.6%)	
Pigmentation			
Excellent	53 (85.5%)	28 (90.3%)	0.667 ^b
Good	6 (9.7%)	3 (9.7%)	
Poor	3 (4.8%)	0 (0%)	
Notching			
Excellent	56 (90.3%)	29 (93.5%)	0.714 ^c
Good	6 (9.7%)	2 (6.5%)	

^a Yates continuity correction test^b Fisher–Freeman–Halton test^c Fisher's exact test

Pigmentation ($p = 0.667$), scar formation ($p = 0.932$) and notching ($p = 0.714$) were evaluated using the t test and they were found to be irrelevant to the columellar incision technique employed (Table 2).

Discussion

“External approach” septorhinoplasty is now a worldwide accepted surgical technique. However, patients may sometimes be dissatisfied because of the residual scar formation on the columella. To prevent such complications, authors have directed their studies to the causes of unsatisfactory columellar scar formation. Hereby new methods and considerations have been proposed to obtain satisfactory scars [10].

A scar formation can change an intensive work of surgery to obtain a good result to a worse, undesirable and disappointing end cosmetic defects on the face can be both physically and psychologically disturbing. We know that different surgical techniques and incision lines have been used to obtain better scar formation in various operations. Of course too many factors affects wound healing and cause hypertrophic scar formation. Recent studies have shown different results about hypertrophic scar formation after columellar incisions in different populations. In a study on columellar scar analysis among the Arabian population in 1998, Bafaqeeh and Al-Qattan [11] pointed out the lack of detailed columellar scar assessment among rhinoplasty surgeons. They criticized authors for their failure to evaluate columellar wound healing objectively and were surprised to find a high percentage of unsatisfactory scars (22%) In 1987, Adamson [12] referred to studies reporting no patient

dissatisfaction or scars requiring revision. In his experience, there was no excessive scarring even with Asians and blacks, and he considered the columella as a preferred site for healing. However, his statements were not backed by objective scar assessments, and his criteria for good or poor scars were not defined precisely. In 1990, Adamson et al. [13] in 81 patients who underwent external approach septorhinoplasty, elaborated a subjective and objective scar analysis of. They inspected photographs of patients at 12 months postoperatively with the preoperative images and considered as failure any barely visible, level, and thin line scars. Their method of scar assessment included 3 items (absence or presence of level, visibility, and notching). They found that there was 1 subjective failure (1.2%), and 2 minor objective failures (2.5%). They recommended that external approach septorhinoplasty made to minimize difficulties in performing the open approach and to maximize scar cosmetics. Verim et al. [10] searched of in a Turkish population, effect of nose skin on the columellar incision scar in a prospective clinical study and they found that there was no statistically significant difference in healing between the skin thickness of the tip, supratip, left nostril, right nostril, columella and mean skin thickness values, skin types, skin textures, and smoking with regard to columellar scar formation. We used a simple scar assessment scale to analyze the columellar scar. We have objectively evaluated pigmentation and notching. Additional parameters can be added and considered for evaluation by authors for a detailed assessment. Various incision techniques have been described so far to get a better columellar scar. Celik [2] in their study, running “W” incision was compared to the scar with “V” type incision. They showed that running “W” incision better scar quality than the “V” type incision. Aksu et al. [14] in similar study compared columellar scar analysis between transverse and inverted-V incision in open rhinoplasty. They found that the inverted-V incision might be a better choice in open rhinoplasty. We found that “W” incision and inverted-V incision have similar scar quality. In open rhinoplasty, the columellar W and inverted-V incisions provide a good guide for suture placement. This can prevent scar depression and notching on the columellar incision. In rhinoplasty, the open technique is preferred to expose the nasal anatomy and achieve more predictable results. As a result of this assessment, we conclude that the “W” incision and the inverted-V incision are good alternatives for open technique nasal surgery.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval Ethics committee approval was received for this study from the local institutional review board.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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