Case Report

Electrocautery for Cartilage Camouflage in Rhinoplasty: A Case Report

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ABSTRACT

Rhinoplasty is usually associated with adding and subtracting tissues around structural cartilages to provide favorable contour. Minor corrections in cartilage shape and position, may have significant effect on final result. Upon last look in rhinoplasty, surgeon decides to do refinement, especially in thin skin patients. Traditionally blades and scissors are commonly available instruments to apply refinement. We examined a different solution in some patients and here presented our experience in a 36 yr old female in Tehran, Iran. Upon completion all stages of surgery such as osteotomy and cartilage sutures and before skin closure, surgeon examined the nose and if there was any minor hump on dorsum or asymmetric prominence of lower lateral cartilage, he could apply low voltage electrocautery with strict control to do camouflage. This may help surgeon to administer last monitoring before closure. Blades and scissors are commonly used to remove extra marginal cartilages, and reduce remained cartilage hump. We noticed low voltage electrocautery may provide smoother dorsum or even curves with more control during final curve.

KEYWORDS
Electrocautery; Rhinoplasty; Cartilage; Comfuligation

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INTRODUCTION

Rhinoplasty is among the most complicated surgeries which demands careful and detailed manipulations to reach optimal results. Every millimeter change can transfer final shape in kilometers. Therefore, careful and concise handling is mandatory, especially when the material is cartilage [1]. This upgraded procedure contains minor additions and reductions in less than millimeters, especially in thin skin patients. Every trainer becomes familiar with such technical details and tries to select suitable introduced ways [2]. Upon improvement in their career, surgeons achieve personnel preferences.

Dorsal and tip irregularities may challenge surgeon at the end of surgery and push him to do extra works to have refined and smooth curves [3,4]. Blades and scissors are commonly available instruments to subtract excess cartilages and trim irregular surfaces. Some do by fine and gentle rasping on repositioned cartilages, cautiously. Though, there are differences in

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compressive and elastic properties of nasal septum and other parts of nose [5] finding a new source of meticulous carving cartilage must be interesting [6].
Here, we present our routine electrocautery use in final cartilage refining, which is safe and more controllable.

CASE PRESENTATION

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the Ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The patient gave written informed consent for using her images.
Our selected patient was a 36 yr old female who wanted to do changes in her nose appearance while preserving good airflow through the nose in a referral hospital (Razi Hospitl) in Tehran, Iran. She was prepared for open septo-rhinoplasty surgery. All the steps of standard rhinoplasty were done accordingly. After completion of osteotomies and cartilage adjustments in dorsum and tip, the final examination was done to evaluate the dorsum and tip symmetry and optimal curves. If surgeon found any residual hump or irregular grafts on tip or lower lateral cartilage, then surgeon applied the electrocautery to make smooth surfaces and margins. We adjust device`s voltage as low as possible (Figure 1). Moreover, we always use plastic cover except distal several millimeters to protect surrounding tissues from thermal injury.
By this way, every fine correction can be done, even in thin lower lateral cartilage (Figure 2).
All of the procedure can be done under fine control and syringe flushing helps to cool the cartilage and have a perfect visualization. This step is shown in the intraoperative video (Video 1).
All the patients treated by this way, had similar shape to previously corrected cases by other instruments like, blade or scissor (Figure 3).

Figure 1: Electrocautery device setting during Rhinoplasty

Figure 2: Correction of minor irregularity of lower lateral cartilage

Figure 3: (left). Preoperative photos of a 30 years old woman who asked more natural shape. (right) 30 months later after standard rhinoplasty and final cartilage refinement by low voltage electocautery

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DISCUSSION

Electrocautery has its impressed lots of operations since decades. Needle ablation can be one of primitive applications of this system [7], and gradually developed instruments provided better opportunities to facilitate surgeries and control bleeding. Head and neck can be assumed areas with significant concerns about postoperative bleeding and accumulation of blood or fluids. There are various types of instruments examined by surgeons and passed their safety as improvements added to technology. For example, Sharma demonstrated safety of Colorado Microdissection Needle in skin surgery of cranio-maxillofacial area [8].

Electrocautery has been applied in nose surgeries, too. Rhinophyma is the point of focus, where moderate and severe cases can be cured by electrocautery safely and efficiently as presented earlier [9,10]. They treated rhinophyma by high frequency electrocautery and mostly worked on cutaneous tissues, which secondarily replaced by new skin and healed tissues. Though, we carefully protected skin and subcutaneous tissues and worked on cartilage- as we needed.

We lowered the voltage to minimize peripheral damage to 25 v. At this level we have not any long-term complication or cartilage deformity. Rand et al illustrated the effect of high energy electric devices can destroy human fresh articular cartilage while meniscus surgery and recommended controlled electrocautery usage [11]. We agree with them, and suggest lower energy to reach acceptable results.

In a comprehensive study by Fertuzinhos et al on-materials mimic human cartilage, they evaluated the thermomechanical features of cartilage. They found a lot of variability in different cartilages of nose. And noticed in temperature between 100 C to 130C has peak consistency, maybe due to water evaporation, and determined the suitable material to substitute cartilage [12].

Youn et al evaluated thermal properties of different cartilages and concluded that auricular cartilage has more absorption comparing with nasal septum. They demonstrated diminished cartilage mass up to 4.5% due to water loss which may not be significant in our procedure due to negligible effects [13]. On the other hand, Griffin et al compared compressive properties of different cartilages of nose and found that alar has the most strength compared to septum and lateral cartilages [14].

Edwards et al proposed thermal chondroplasty in some chondromalacia human cartilage, and confirmed their previous theory on chondroplasty potential of radiofrequency in chondromalacia cartilages but, recommended monopolar, as they found bipolar radiofrequency may bring more cell death [15].

Kiem et al compared the cellular structure of cartilage following cartilage cut by blade or electrocautery and found no significant difference [16]. It seems their work has similarity to ours. Here, we tried to clarify more and shoed necessary details, which are practically important. We strongly recommend it, as in our hands handling this device is easier than blade or scissors which may cut in farther and deliver fewer smooth surfaces than electrocautery.

CONCLUSION

Last examination of surgery field in rhinoplasty before skin closure, might show minimal cartilage irregularities which need more handling. It seems low energy electrocautery can be safe and easy for final refinement.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest to disclose.

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