Pneumothorax: An Uncommon Complication in Septorhinoplasty

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Abstract

Autologous costal cartilage harvesting is a known method in cases of septorhinoplasty. Whereas harvesting costal cartilage graft is considered an easy procedure, it could be associated with various complications. However, various unexpected complications may arise giving challenges to the medical team treating the case. This case reports an uncommon complication of pneumothorax after harvesting cartilage and confirming that there was no pleural tear present initially. Furthermore, symptoms, features, radiological findings, active intervention and co-management with a thoracic surgery team have been undertaken. Even though all consideration was taken, management and expectation of such a complication should be kept in mind.

Keywords: Pneumothorax; Septorhinoplasty

Introduction

Septorhinoplasty is considered one of the most important and versatile cosmetic and functional procedures that is used nowadays in patients complaining of nasal deformity and functional problems related to nasal breathing. Out of various grafts that are used routinely, autologous rib cartilages are used as the best source of grafting material in rhinoplasty in cases such as saddle nose deformity and congenital nasal deformity. Some surgeons prefer rib cartilage, as it is stronger than other cartilages and can be carved out into various shapes depending on the patient’s nasal deformity [1].

Although a pneumothorax is a rare complication when harvesting a rib cartilage, it may occur despite being performed by experienced hands. Careful dissection preserving the posterior perichondrium is mandatory to prevent such a complication [1]. Many studies were conducted to assess the complications associated with the use of costal rib cartilage in Rhinoplasty. Most of them reported complications such as pneumothorax, pleural tear, infection, seroma, scar-related problems and severe donor site pain [2]. However, the complication rate related to grafts, specifically pneumothorax is found in studies to be as low as non-existence [3,4].

Case Report

A 25-year-old medically free male came to the ENT clinic with a history of nasal trauma 5 years ago which was followed and treated by a septoplasty 2 years after the incident. He was complaining of nasal obstruction, hyposmia and nasal deformity including the loss of tip support, saddle nose, broad base, broad dorsum of the nose and asymmetry of the dorsal aesthetic lines.

On CT scan, a dorsal septal deviation to the left side, narrowing of the left internal nasal valve, right posterior ethmoiditis, thickening of the left maxillary mucous membrane and hypertrophy of the right inferior turbinate were reported.
Furthermore, an operative plan was structured as following: Open technique* Shaped trans-columellar incision with blade no 11 followed by a dorso-lateral skin flap dissection in proper fashion. Afterwards, a perichondrial septal flap dissection septum anterior to posterior and a removal of 3 mm from dorsum was performed. In addition, harvesting of right 7th rib cartilage and rectus muscle fascia was done by the thoracic team. After suturing the floor of the septum with maxillary spine using straight needle with skin vestibule, another suture at the internal nasal valve was taken. Meanwhile, powered rasping to the nasal bone and medial oblique osteotomy with low to low osteotomy and a bilateral spreader graft was performed. A crisscross suture (B shaped) to the nasal bone was followed by a cephalic trim to the lower lateral cartilage then a strong rib cartilage strut, lateral crural and rim grafting were done. Moreover, a soft triangle graft using a templet from the crural with an inter-domal and a domal creation suture while the upper lateral stay suture supra tip suture was done. Finally, closing the wound with internal and external splint was undertaken to finalize the procedure.

The patient was placed in the supine position with a small sand bag under the hip while the right 7th rib tip was palpated. Afterwards, a 2.5 cm incision was marked between the 6th and 7th rib extending laterally from the 7th rib tip. The first incision was to reach the fascia. Palpation was repeated to confirm the rib position and dissection continued until the rectus fascia to harvest the fascia with a further dissection of the muscle until the (Figure 1) the right distal 7th rib was fully exposed.

![Figure 1: (A) Rectus Muscle Fascia. (B) Harvesting of the right 8th rib cartilage.](image)

Afterwards, the tip of the rib was grasped by forceps and used the cautery to dissect retrograde supraperiosteal in the bony junction. A Doyen elevator was placed under the palpable bony junction and a #15 blade was used to cut through the junction (Figure 1). Once the graft was removed, the wound was filled with saline and the anesthesiologist expanded the chest to test for pneumothorax. The wound was partially closed in layers as extra cartilage could be banked for future use without any use of drainage.

A routinely post-operative X-rays of the chest was performed for evaluating any complications, showing a right-side pneumothorax (Figure 2) an uncommon complication compared to the 23 cases presented to our department. A routine chest tube was inserted through the perforation after making sure there were no adhesions and no further perforation (Figure 2). During the next 2 days of hospitalization the chest x-ray showed resolution of the pneumothorax and he was discharged with a follow-up plan over a course of 6 months that showed no further complication.

Discussion

The present report describes our use of autologous costal cartilage in 23 rhinoplasty cases. Meanwhile, costal cartilage harvesting cases was used in revision of rhinoplasty patients who required major septal reconstruction. Out of a total of 23 cases that underwent rhinoplasty using the same approach, this was the first case that was complicated by a pneumothorax in the department.

A retrospective review evaluated 108 patients who underwent rhinoplasty using autologous costal cartilage. The complication rate in using the autologous Costal Cartilage technique in Rhinoplasty was 9 cases of seroma in the chest wound (8.3%), 2 cases of keloid scar (1.8%), 1 case of pneumothorax (0.9%) and 1 case of persistent pain in the chest wound (0.9%) [3]. Another retrospective study evaluated 83 patients who had septorhinoplasty with autologous costal cartilage grafts, they found that the complications were related to the graft itself in the process of graft harvesting procedure, surgical outcome and patient satisfaction.

In a series of Reconstruction Rhinoplasty cases performed from January 2011 to December 2016, a total number of 18 patients were chosen and reported a post-operative complication of dorsal irregularity, scar and septal perforation. However, complications such as seroma and pneumothorax were absent [5]. Similarly, in a meta-analysis that collected data from 9 studies with a total sample of 458 patients reported a pneumothorax rate of 0%. These results show that although a pneumothorax is a rare complication when harvesting a rib cartilage, it may happen even with an experienced practitioner [1].

Most studies in the literature reported a very low rate of pneumothorax as a complication [1-3,7,8]. The diagnosis of pneumothorax in our case was made by a postoperative chest radiograph as recommended [7] while a fast resolution of the pneumothorax occurred. As per guidelines, pneumothorax conservative management and optimal recovery can take 2 days to resolve without the need for chest tube insertion [3].

Conclusion

Harvesting rib cartilage in septorhinoplasty is a simple procedure and usually has minor complications compared to others. However, it should be used with a consideration of serious complications that can be found among surgeries.

Serious complications could be avoided in presence of ENT and Thoracic team by taking necessary precautions and deal with it by using special techniques.

Figure 2: (A) Chest x-ray showing pneumothorax. (B) Chest x-ray showing chest tube.
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Bibliography


