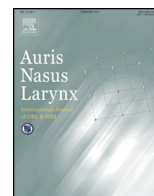




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Case report

Successful management of primary atrophic rhinitis by turbinate reconstruction using autologous costal cartilage

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ABSTRACT

Initial management of primary atrophic rhinitis is conservative, with nasal ointments, saline irrigation, and antibiotics prescribed to relieve symptoms. However, in cases that show no improvement, a surgical approach is considered. Recently, many studies have reported successful surgical outcomes using various nasal implants. However, no study has reported implantation of autologous costal cartilage in PAR patients. We report here the case of a 63-year-old woman diagnosed with PAR that was intractable to medical therapy. Under general anesthesia, bilateral inferior turbinate reconstruction with autologous costal cartilage was successfully performed without any complications. One month after surgery, her symptoms improved dramatically. At the 2-year follow-up, her Sinonasal Outcome Test 25 (SNOT-25) score was 6, down from an initial score of 108. Her OMU CT showed improved sinonasal mucosal thickness and disappearance of thick mucosal secretion compared with preoperative CT image. Although this is a single case experience, it is suggested that turbinate reconstruction using autologous costal cartilage can serve as promising surgical modality for management of atrophic rhinitis.

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1. Introduction

Atrophic rhinitis is a chronic, gradually progressing degenerative condition of the nasal cavity characterized by a foul odor (ozena), nasal obstruction, dryness, and crusting [1]. The etiology of primary atrophic rhinitis is mostly unknown. Progressive metaplasia and atrophy of all mucosal components (epithelium, vessels, and glands) takes place because of increased osteoclastic activity, resulting in a volumetric decrease of sinonasal structures. The turbinate show shrinkage and the inferior turbinate is affected the most. Endoscopic inspection reveals a large, wide nasal cavity with dried mucosa [2].

Radiological findings of primary atrophic rhinitis have been previously described. Pace-Balzan et al. [3] reported the following features: (1) mucosal thickening of the paranasal sinuses, (2) loss of definition of the ostiomeatal unit (OMU) secondary to resorption of the ethmoid bulla and uncinate process, (3) hypoplasia of the maxillary sinuses, (4) enlargement of the nasal cavities with erosion and bowing of the lateral nasal wall, and (5) bony resorption and mucosal atrophy of the middle and inferior turbinate. However, there have been no studies comparing changes in radiological findings following surgical management of primary atrophic rhinitis patients.

Classically, the management of patients with primary atrophic rhinitis is aimed at alleviating symptoms using nasal irrigation douche or ointment application. In 1971, Young [4] proposed closure of the nostril (Young's operation), and Saunders [5] suggested endonasal microplasty (intranasal implant insertion) for the surgical management of primary atrophic rhinitis. However, Young's operation has its demerit on the possibility of decreased patient's quality of life due to

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closure of the nostril. In addition, previous nasal implantation techniques carry the risk for implant extrusion, absorption, and moreover, there are insufficient long term follow-up results [6–9]. The corresponding author (YJ Jang) have previously reported promising outcomes following inferior turbinate reconstruction using autologous costal cartilage in empty nose syndrome (ENS) patients [10]. Inspired by the fact that primary atrophic rhinitis and ENS share similar physical and symptoms, we hypothesized that the turbinate reconstruction procedure would be also beneficial for the primary atrophic rhinitis patients as well. Hence, we report here the first case of primary atrophic rhinitis successfully treated by turbinate reconstruction using autologous costal cartilage.

2. Case report

2.1. Clinical history

A 63-year-old woman, previously healthy with no underlying conditions or history of nasal surgeries, complained bilateral nasal obstruction, foul odor, severe crusting, postnasal drip, and dryness of both nasal cavities. These symptoms persisted and bothered the patient for many years, which led her to visit her local ENT clinic, where she received frequent nasal dressings for the nasal crusting of nasal cavities. Despite those therapies, the symptoms did not completely resolve; therefore, she visited the Asan Medical Center to seek a second opinion.

Endoscopic examination revealed severe crusting of the mucosa of nasal cavities bilaterally, along with bilateral atrophy of the turbinate (Fig. 1). Her initial SNOT-25 score was 108. We diagnosed the patient with primary atrophic rhinitis and prescribed an oral antihistamine, a mucolytic agent, and clarithromycin, along with nasal irrigation with saline solution.

After 1 month, there was no improvement in her symptoms and the severe crusting persisted (Fig. 2A). Computed tomography of the OMU CT showed atrophy of the middle and inferior turbinate, hypoplasia and obstruction of the

maxillary sinus, and mucosal swelling of all paranasal sinuses (Fig. 2B).

2.2. Surgical technique

Turbinate reconstruction was performed as described in our previous report on treating patients with ENS [10]. After the patient was placed under general anesthesia, the right sixth costal cartilage was harvested. A cube of harvested cartilage with dimensions of 2 cm × 4 cm × 2 cm (length, breadth, thickness, respectively) was carved and designed into two conical grafts (Fig. 3A). Turbinate reconstruction was then performed by making an incision on pyriform apertures bilaterally (Fig. 3B). After the submucosal flap was elevated, the graft was inserted submucosally; the wound was closed by the simple suture of the nasal mucosa. The inferior turbinate were reinforced and reconstructed, thus narrowing nasal cavities bilaterally.

2.3. Surgical outcome

At 2 weeks after surgery, crusting was diminished, and augmented new inferior turbinate below the native turinate was observed bilaterally. At 3 months after surgery, the patient reported she no longer had any sensation of crusting of her nasal cavity and had a decrease in postnasal drip. At the 2-year follow-up, both inserted implants were still in place without resorption on gross (Fig. 2C), in addition to amelioration in the patient's initial symptoms. Her SNOT-25 scores had decreased to 6 (Fig. 4). OMU CT showed resolved obstruction of the sinus opening as well as decreased mucosal swelling (Fig. 2D). No surgery-related complications were observed during the 2-year follow-up period, including graft absorption or extrusion.

3. Discussion

We report here the first successful management of primary atrophic rhinitis by surgical reconstruction of the turbinate



Fig. 1. Initial endoscopic nasal examination of the patient; pus-like thick, yellowish discharge with atrophied turbinate are seen. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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