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CASE REPORT AESTHETIC

Dorsal Nasal Mucocele: A Delayed Complication of Rhinoplasty

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Abstract Mucocele formation is a very rare complication of rhinoplasty surgery, with only 26 incidences documented in the medical literature. Postrhinoplasty nasal mucoceles are believed to result from the growth of ectopic nasal respiratory epithelium displaced during the rhinoplasty procedure. Although most cases of nasal mucocele present within weeks of rhinoplasty surgery, exceptional accounts describe nasal mucoceles presenting years after rhinoplasty. This case report describes an extremely delayed case of dorsal nasal mucocele that presented 21 years after the patient underwent a septorhinoplasty. The aesthetically bothersome mucocele was successfully removed with an open rhinoplasty approach, and the histopathologic analysis was consistent with a simple benign mucous retention cyst. The history, etiology, and prevention of mucocele formation in rhinoplasty surgery also are discussed.

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Keywords Rhinoplasty · Complication · Facial plastic surgery · Dorsal nasal mucocele · Histopathology

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Introduction

Mucocele formation is an exceedingly rare complication of rhinoplasty. Given the large number of rhinoplasty operations performed (in the USA, 243,772 rhinoplasties were performed in 2011 alone), only 26 cases complicated by the postoperative development of a mucocele have been documented (Table 1) [1].

More than half of all postrhinoplasty mucocele cases reported have affected the nasal dorsum. Fewer cases involving the inner canthus, glabella, alar cartilages, nasal tip, and paranasal region have appeared. The time course of mucous cyst development can vary widely. Most cysts present within weeks of surgery, but cases can take even 20 years (Raine et al. [2]) to develop.

Although the etiology of postoperative nasal mucocele remains unclear, three leading theories have been proposed regarding their development. The first theory was reported by McGregor et al. [3] in 1958 after a patient blew her nose on postoperative day 5 and subsequently experienced the development of a cyst. These authors theorized that the mucocele resulted from nasal mucosal tissue forcibly herniated through the infracture site.

The second theory, developed by Flaherty et al. [4] in 1996, purports that mucoceles develop after nasal mucosa grows postoperatively through osteotomy lines into subcutaneous pockets. The most likely theory, however, was presented by Mouly [5], who in 1970 noted that "rather than herniations, these (cysts) are probably free mucosal grafts in an ectopic position."

We report a case of very delayed mucous cyst formation treated surgically via an open rhinoplasty approach. This case report was deemed exempt from ethical review by the University of California-Irvine, Office of the Research Institutional Review Board.

Table 1 Cases of postrhinoplasty mucocele formation documented in all languages

Author	Time until presentation of mucocele	Mucocele location	Surgical approach	Year of publication	Journal
McGregor et al.	5 days	Dorsum	Not stated	1958	*The Journal of the International College of Surgeons*
Mouly	2 months	Bilateral inner canthi	Direct open	1970	*Annales de Chirurgie Plastique Esthétique*
Senechal et al.	(1) 4 years (2) 10 years	(1) Inner canthus (2) Glabella	External	1981	*Annales d Oto-laryngologie et de Chirurgie Cervico-faciale*
Shulman et al.	10 years	Nasal tip	Intranasal	1983	*Plastic and Reconstructive Surgery*
Harley et al.	(1) 6 years (2) 1 year	(1) Dorsum (2) Dorsum	(1) Not stated (2) Intercartilaginous	1990	*Archives of Otolaryngology-Head & Neck Surgery*
Zijlker et al.	Not stated	Dorsum	Direct open	1993	*Rhinology*
Flaherty et al.	2 years	Supratip	Intercartilaginous	1996	*Aesthetic Plastic Surgery*
Kotzur et al.	(1) 6 years (2) 4 years (3) 2 years	(1) Dorsum (2) Dorsum (3) Dorsum	(1) Direct open (2 & 3) Intercartilaginous	1997	*Plastic and Reconstructive Surgery*
Romo et al.	2 years	Dorsum	Direct open	1999	*Archives of Facial Plastic Surgery*
Karapantzos	3 months	Alar base	Cutaneous incision	1999	*Rhinology*
Dini et al.	3 months	Dorsum	Direct open	2001	*Plastic and Reconstructive Surgery*
Raine et al.	20 years	Alar base	Upper buccal sulcus	2003	*British Journal of Plastic Surgery*
Bracaglia et al.	1) 2 years 2) 1.5 years	(1) Dorsum (2) Dorsum	Endoscopic	2005	*British Journal of Plastic Surgery*
Riedel et al.	6 months	Lateral nasal wall	Intercartilaginous	2007	*HNO*
Dionyssopoulus et al.	(1) 22 months (2) 6 months	(1) Glabella (2) Inner canthus	(1) Direct open (2) Transcartilaginous	2010	*Annals of Plastic Surgery*
Ntomouchtsis et al.	15 months	Glabella	Direct open	2010	*Oral Maxillofacial Surgery*
Struijs et al.	40 years	Dorsum	External rhinoplasty	2010	*B-ENT*
Pausch et al.	(1) 1.5 years (2) 1 year	(1) Dorsum (2) Dorsum	(1 & 2) Open, with rib cartilage graft reconstruction	2010	*Cleft Palate Craniofacial*
Ünlu et al.	6 months	Dorsum	Direct open	2011	*Kulak Burun Bogaz Ihtis Derg*

A comprehensive literature search using search engines, online databases (e.g., PubMed), and the World Wide Web and dating back to 1958 was performed. The key search terms included: "mucocele," "rhinoplasty," "septorhinoplasty," "nasal mucocele," "cyst," "adverse effects," "retention cyst."

Case Report

A 51-year-old man presented to our clinic with a 2-year history of a slowly growing asymptomatic mass on the lateral dorsum of his nose. There was no drainage and no history of infection or recent trauma. The patient claimed to have received a septoplasty 21 years previously to correct a traumatic malformation of his nose but denied ever having received rhinoplasty.

At the physical exam, the mass was firm, free of apparent adhesions, and moderately mobile within the subcutaneous pocket. A fine-needle aspiration was performed but was nondiagnostic because only epithelial cells were identified. Computed tomography (CT) imaging studies indicated a 1-cm, low-density nodule on the inner aspect of the right internal valve that was difficult to characterize (Fig. 1).

The patient was taken to surgery, and an open rhinoplasty approach was used to access the mass. It was a well-demarcated, globular, fluid-containing cystic structure that did not track to either skin or the vestibular surface (Fig. 2). Notably, despite the patient's denial of rhinoplasty, a well-healed intercartilaginous incision was noted.

Fig. 1 Axial view of a 1-cm poorly characterized lesion in the *right* internal nasal vault

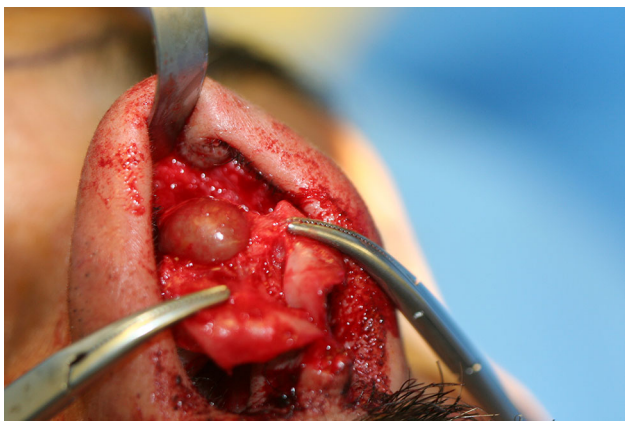

Fig. 2 Intraoperative view of a *right* dorsal nasal mucocele. Note the well-encapsulated appearance of the mucous cyst

The mass was easily removed, and the nose was closed without complication. Histopathologic analysis of the mass demonstrated findings consistent with a simple benign mucous retention cyst because the cyst was lined with both squamous and respiratory type epithelium (Fig. 3). We did not observe recurrence or any other complications in a 6-month follow-up period.

The patient likely had mucosal tissue from the nasal vault trapped subcutaneously during closure of intercartilaginous incisions at the time of the patient's septorhinoplasty 21 years previously. After this initial seeding, the mucosal tissue continued to grow very slowly until it became cosmetically symptomatic and warranted surgical excision.

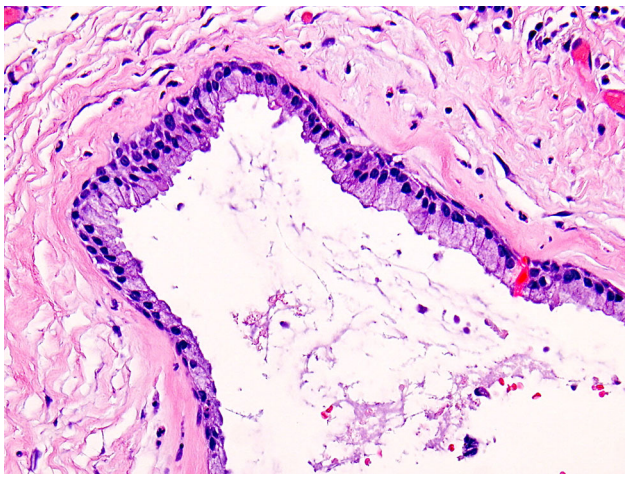

Fig. 3 High-power image of ciliated pseudostratified respiratory type epithelium lining the nasal mucocele

Discussion

Postrhinoplasty nasal mucocele formation is a rare and presumably highly preventable complication of intranasal surgery. The differential diagnosis for nasal mucoceles must include cysts, benign skin adnexal tumors, dermoid cysts, abscesses, foreign body retention, granulomatous disease, infections, encephaloceles, minor salivary gland neoplasms, and lymphomas.

We believe our patient's mucocele is consistent with Mouly's hypothesis of proliferating ectopic nasal mucosal tissue. The idea that nasal mucoceles are the result of herniated tissue cannot be disproven but is less likely given the absence of any connection between the cyst and the nasal mucosa proper in our patient. Given this, the complication of nasal mucocele could be prevented completely by ensuring meticulous removal of all possible mucosal seeding tissue from the surgical field, including mucosal tissue fragments, bony remnants, and cartilaginous debris.

The definitive treatment for nasal mucoceles is excision. Many surgical approaches have been discussed in the literature, including the open rhinoplasty approach (as in our case), the intranasal approach, endoscopic excision, and direct external cutaneous removal. Regardless of the approach used, great success with minimal complication has been seen after complete excision of the nasal mucous cyst capsule.

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