

## Clinical Record

Dr J Verdonck takes responsibility for the integrity of the content of the paper

**Cite this article:** Verdonck J, Van de Perck E, Claes J, Vanderveken OM. Uvulopalatopharyngoplasty for nasal blockage 21 years after total rhinectomy. *J Laryngol Otol* 2021;**135**:937–939. <https://doi.org/10.1017/S0022215121001948>

Accepted: 14 February 2021  
First published online: 27 August 2021

### Key words:

Airway Obstruction; Surgery; Tissue Adhesions; Pharynx; Soft Palate; Nasal Neoplasms; Male; Middle Aged

### Author for correspondence:

Dr Jan Verdonck, Faculty of Medicine and Health Sciences, University of Antwerp, Prinsstraat 13, 2000 Antwerpen, Belgium  
E-mail: [jan.verdonck@student.uantwerpen.be](mailto:jan.verdonck@student.uantwerpen.be)

# Uvulopalatopharyngoplasty for nasal blockage 21 years after total rhinectomy

J Verdonck<sup>1</sup>, E Van de Perck<sup>1,2</sup>, J Claes<sup>2</sup> and O M Vanderveken<sup>1,2</sup>

<sup>1</sup>Faculty of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium and <sup>2</sup>ENT, Head and Neck Surgery, Antwerp University Hospital, Antwerp, Belgium

## Abstract

**Background.** Total rhinectomy is an invasive procedure that significantly impairs the intra-nasal turbulence, humidification and heating of inspired air. The use of uvulopalatopharyngoplasty for the treatment of sleep-disordered breathing disorders such as primary snoring and obstructive sleep apnoea has diminished over the past years because of the emergence of less invasive procedures and alternative therapeutic options. This clinical record presents the treatment of a long-term side effect of total rhinectomy using uvulopalatopharyngoplasty.

**Case report.** In 1997, a 62-year-old male underwent total rhinectomy for a nasal schwannoma, followed by rehabilitation with a nasal prosthesis. Twenty-one years later, he presented with severe complaints of nasal blockage and breathing difficulties during both daytime and night-time. Clinical examination revealed no major anomalies besides significant velopharyngeal narrowing. Thus, in 2019, uvulopalatopharyngoplasty was performed to re-establish velopharyngeal patency. Hereafter, the symptoms of nasal blockage disappeared, resulting in an improved quality of life.

**Conclusion.** Uvulopalatopharyngoplasty may prove useful to treat selected patients with daytime breathing difficulties due to velopharyngeal narrowing.

## Introduction

Total rhinectomy is a surgical procedure exclusively reserved for locally advanced, aggressive or recurrent malignancies of the nasal framework that are not amenable to limited resection or radiotherapy.<sup>1</sup> The removal of the vast majority of the nasal framework and related soft tissues not only has disfiguring consequences, but also interferes with normal nasal function. Nevertheless, the functional sequelae of total rhinectomy are not well known.<sup>2</sup>

For years, uvulopalatopharyngoplasty (UPPP) was considered the standard surgical treatment for sleep-disordered breathing disorders, including obstructive sleep apnoea (OSA).<sup>3</sup> However, the procedure has been frequently questioned for its limited effectiveness,<sup>4</sup> serious complications,<sup>5</sup> and long-term side effects, including dysphagia, globus sensation, velopharyngeal insufficiency and voice changes.<sup>6</sup> Thus, with the emergence of less invasive techniques that reposition rather than excise upper airway structures,<sup>7–9</sup> the use of UPPP surgery has progressively declined in patients with OSA.

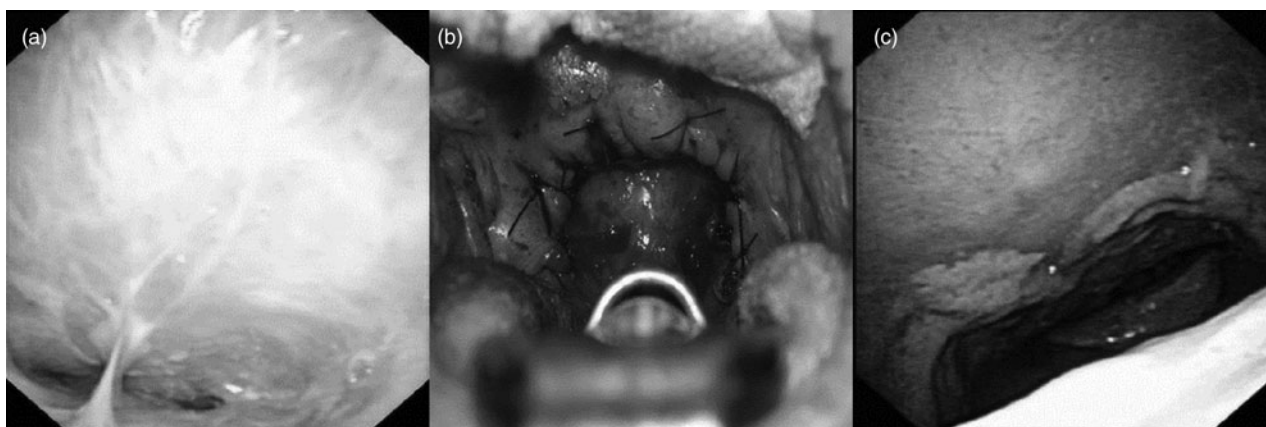
This case report presents the application of UPPP for the treatment of nasal blockage as a long-term side effect of total rhinectomy.

## Case report

In April 1997, a 62-year-old male with no significant medical history underwent total rhinectomy for a nasal schwannoma at the level of the septum and right nostril without distant metastasis. This lifesaving surgical procedure consisted of a bilateral Weber–Ferguson approach<sup>10,11</sup> and complete resection of the nasal septum. Bone-anchored fixation screws were inserted for prosthetic rehabilitation.

Pathological investigation revealed a moderately differentiated peripheral schwannoma, grade II according to the grading system proposed by Coindre and colleagues,<sup>12</sup> with measurements of 1.8 × 1.1 × 1.2 cm. The excision was performed with free margins. Approximately five months after the procedure, the inferior nasal conchae were partially resected because of manifest hyperplasia of the nasal mucosa. The final result was both functionally and aesthetically satisfactory.

Twenty-one years later, from October 2018 onwards, the patient consulted our department with complaints of nasal blockage. On further enquiry, the patient stated that he used the nasal prosthesis constantly during the daytime and at night-time without any issues. As clinical examination showed no major anomalies, conservative treatment with aerosol, nasal irrigation and ointments was initiated. However, during the following weeks, his symptoms worsened; he suffered from both diurnal and nocturnal dyspnoea, leading to dysphagia, insomnia and a general decline in physical activity. As his complaints mostly occurred during the day, no polysomnography was performed.



**Fig. 1.** (a) Pre-operative image showing velopharyngeal adhesions. (b) Per-operative status. (c) Post-operative image showing a patent nasopharyngeal airway one month after uvulopalatopharyngoplasty.

**Table 1.** Overview of total rhinectomy case series

Author(s) (year)	Cohort size (n)	Recurrence after total rhinectomy (%)	Disease-related mortality (%)	Follow-up duration (mean (range); months)	Rehabilitation with nasal prosthesis (surgical flap) (%)
Harrison (1982) <sup>14</sup>	13	–	30	–	100–0
Stanley & Olsen (1988) <sup>1</sup>	51	43	21	68 (3–216)	67–42
Chipp <i>et al.</i> (2011) <sup>15</sup>	14	14	14	30.1 (0–96)	79–21
Subramaniam <i>et al.</i> (2016) <sup>16</sup>	9	0	0	50.7 (2–96)	78–22
Becker <i>et al.</i> (2016) <sup>18</sup>	14	0	0	30.8	–
Girardi <i>et al.</i> (2020) <sup>17</sup>	10	60	30	28.7 (5–66)	0–90

Fibre-optic laryngoscopy revealed adhesion of the soft palate to the pharyngeal wall, causing significant narrowing at this level (Figure 1a). Computed tomography showed no causal anomalies. In May 2019, after a thorough discussion with the patient and his family, we decided to perform UPPP surgery in order to enlarge the retropalatal airway.<sup>3</sup>

The first step of the procedure consisted of bilateral tonsillectomy using cold instruments. Subsequently, both the anterior and posterior arches of the soft palate were extensively trimmed while preserving the muscular layer. The uvula was excised as well. Then, patency of the retropalatal airway was verified by inspecting the passage of light from the oropharynx to the nasopharynx. Finally, the mucosal edges of the anterior and posterior arches were reapproximated with interrupted resorbable sutures. Additionally, the upper airway was expanded in the lateral dimension by suturing both tonsillar pillars (Figure 1b).

The patient was discharged home the next day in a general good condition. Importantly, nasal blockage disappeared shortly after the procedure, leading to a significant improvement in quality of life for the patient. One month after surgery, we noted a well-healed surgical site and a patent nasopharyngeal airway (Figure 1c). Presently, one year after the procedure, the patient is satisfied with the results, despite experiencing limited nasal regurgitation of liquids and mucus production. The Nasal Obstruction Symptom Evaluation ('NOSE') survey<sup>13</sup> objectified the symptomatic improvement, with a pre-operative score of 19 out of 20, compared to 7 out of 20 one year post-operatively.

## Discussion

A search of the literature was conducted in August 2019 using the PubMed search engine, with the following search terms:

uvulopalatopharyngoplasty, pharyngoplasty, rhinectomy, velopharynx, nasal prosthesis and Ferguson Weber. Articles were selected based on title and abstract; in addition, the references of selected articles were screened.

As total rhinectomy is an uncommon procedure, only a few case series have been published on this topic.<sup>1,14–18</sup> Most of these studies addressed surgical outcome in terms of survival and recurrence (Table 1). The largest cohort to date was described by Stanley and Olsen, who performed total rhinectomy in 51 patients.<sup>1</sup> Squamous and basal cell carcinoma accounted for the majority (86 per cent) of the malignancies. Similar to other studies, total rhinectomy often served as an end-stage procedure following (multiple) unsuccessful attempts of more limited surgical excision.

Reconstruction of the surgical defect after total rhinectomy is an essential aspect of care. Both surgical reconstruction and a nasal prosthesis can be used for this purpose.<sup>19,20</sup> A nasal prosthesis is the cornerstone of rehabilitation, as autologous reconstruction of large defects is technically challenging and often unsatisfactory.<sup>1</sup> The prosthesis is made of medical grade silicon and is individually tailored to fit the nasal area. Osseous integrated magnetic abutments keep the prosthesis in place. The major advantage of a prosthesis is that it allows early rehabilitation, as well as regular inspection of the former tumour site for recurrence.

Obviously, however, a nasal prosthesis cannot replace normal nasal function. Becker *et al.* investigated the functional and aesthetic outcomes in patients with a nasal prosthesis.<sup>2</sup> They found that patients were most satisfied about the appearance, overall function and fit of the prosthesis. However, there was wide variability in terms of the outcomes of breathing and smelling, possibly related to the extent of tumour excision. As the turbinates in particular affect nasal airflow and heat

exchange, resection of these structures may lead to symptoms reminiscent of empty nose syndrome, such as crusting, dryness and blockage.<sup>2</sup>

Twenty-one years after total rhinectomy, our patient experienced progressive breathing difficulties without any local anomalies of the nasal cavity. This clinical report discusses the treatment of this long-term sequela using UPPP. The procedure remedied the retropalatal narrowing as observed endoscopically, and significantly improved nasal breathing. Thus, alterations in nasal heating, humidification and turbulence may not only disrupt normal nasal functions, but may also change the configuration of upper airway structures. The observed retropalatal narrowing is presumably due to persistent mucosal dryness, leading eventually to fixed adhesions between the soft palate and pharyngeal wall.

- Total rhinectomy is an uncommon procedure that is exclusively reserved for locally advanced, aggressive or recurrent malignancies of the nasal framework
- Total rhinectomy impairs the intranasal humidification and heating of inspired air
- Altered nasal function may cause mucosal dryness, pharyngeal structure adhesion, and ultimately upper airway narrowing or obstruction
- Use of uvulopalatopharyngoplasty for obstructive sleep apnoea has diminished since the emergence of less invasive procedures
- Uvulopalatopharyngoplasty may be indicated to treat selected patients with daytime breathing difficulties associated with velopharyngeal narrowing

Uvulopalatopharyngoplasty may prove more effective for this purpose than other, less invasive palatal techniques for OSA.<sup>7–9</sup> Uvulopalatopharyngoplasty is an ablative technique and creates an optimal expansion of the retropalatal space in the anteroposterior direction.<sup>3</sup> Thus, although it does not alleviate the causal mechanism of mucosal dryness, UPPP may be beneficial for these patients by restoring upper airway patency.

This application of UPPP may not be limited to velopharyngeal narrowing after total rhinectomy alone. Cranford *et al.* described a 56-year-old tracheostomised Hispanic male with extensive nasopharyngeal and pharyngoepiglottic scarring secondary to extra-laryngeal tuberculosis.<sup>21</sup> This impaired decannulation, as occluding the stoma resulted in severe nasal breathing difficulties. After UPPP, the nasopharyngeal airway became patent again, leading to an uneventful decannulation.<sup>21</sup> Hence, UPPP appears to be a valid option for people with retropalatal narrowing and breathing difficulties. As such, UPPP should at least be discussed within the multidisciplinary team as a potential option in these specific cases.

## Conclusion

Total rhinectomy is an invasive procedure that impairs the intranasal humidification and heating of inspired air. This may cause mucosal dryness, adhesions between pharyngeal structures, and ultimately upper airway narrowing or obstruction. The use of UPPP for OSA has diminished over the past years as a result of the emergence of less invasive procedures.

According to this case report, however, UPPP should be kept in the armamentarium of ENT surgeons to treat selected patients with daytime breathing difficulties associated with velopharyngeal narrowing.

**Competing interests.** None declared

## References

- 1 Stanley RJ, Olsen KD. Rhinectomy for malignant disease. A 20-year experience. *Arch Otolaryngol Head Neck Surg* 1988;**114**:1307–11
- 2 Becker C, Becker AM, Dahlem KKK, Offergeld C, Pfeiffer J. Aesthetic and functional outcomes in patients with a nasal prosthesis. *Int J Oral Maxillofac Surg* 2017;**46**:1446–50
- 3 Fujita S, Conway W, Zorick F, Roth T. Surgical correction of anatomic abnormalities in obstructive sleep apnea syndrome: uvulopalatopharyngoplasty. *Otolaryngol Head Neck Surg* 1981;**89**:923–34
- 4 Caples SM, Rowley JA, Prinsell JR, Pallanch JF, Elamin MB, Katz SG *et al.* Surgical modifications of the upper airway for obstructive sleep apnea in adults: a systematic review and meta-analysis. *Sleep* 2010;**33**:1396–407
- 5 Kezirian EJ, Weaver EM, Yueh B, Deyo RA, Khuri SF, Daley J *et al.* Incidence of serious complications after uvulopalatopharyngoplasty. *Laryngoscope* 2004;**114**:450–3
- 6 Tang JA, Salapatras AM, Bonzelaar LB, Friedman M. Long-term incidence of velopharyngeal insufficiency and other sequelae following uvulopalatopharyngoplasty. *Otolaryngol Head Neck Surg* 2017;**156**:606–10
- 7 Vicini C, Hendawy E, Campanini A, Eesa M, Bahgat A, AlGhamdi S *et al.* Barbed reposition pharyngoplasty (BRP) for OSAHS: a feasibility, safety, efficacy and teachability pilot study. “We are on the giant’s shoulders”. *Eur Arch Otorhinolaryngol* 2015;**272**:3065–70
- 8 Pang KP, Woodson BT. Expansion sphincter pharyngoplasty: a new technique for the treatment of obstructive sleep apnea. *Otolaryngol Head Neck Surg* 2007;**137**:110–14
- 9 Li HY, Lee LA. Relocation pharyngoplasty for obstructive sleep apnea. *Laryngoscope* 2009;**119**:2472–7
- 10 Weber O. Presentation of a patient with resection of the lower jaw, the naturhist [in German]. *med Vereins z Heidelberg* 1845;**4**:80–2
- 11 Ferguson W. *In Operation of the Upper Jaw*. Edinburgh: John Churchill, 1842
- 12 Coindre MJ, Trojani M, Contesso G, David M, Rouesse J, Bui N *et al.* Reproducibility of a histopathologic grading system for adult soft tissue sarcoma. *Cancer* 1986;**58**:306–9
- 13 Stewart MG, Witsell DL, Smith TL, Weaver EM, Yueh B, Hannley MT. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. *Otolaryngol Head Neck Surg* 2004;**130**:157–63
- 14 Harrison DF. Total rhinectomy--a worthwhile operation? *J Laryngol Otol* 1982;**96**:1113–23
- 15 Chipp E, Prinsloo D, Rayatt S. Rhinectomy for the management of nasal malignancies. *J Laryngol Otol* 2011;**125**:1033–7
- 16 Subramaniam T, Lennon P, O’Neill JP, Kinsella J, Timon C. Total rhinectomy, a clinical review of nine cases. *Ir J Med Sci* 2016;**185**:757–60
- 17 Girardi FM, Hauth LA, Abentroth AL. Total rhinectomy for nasal carcinomas. *Braz J Otorhinolaryngol* 2020;**86**:763–6
- 18 Becker C, Kayser G, Pfeiffer J. Squamous cell cancer of the nasal cavity: new insights and implications for diagnosis and treatment. *Head Neck* 2016;**38**(suppl 1):E2112–17
- 19 Miller TA. Nasal reconstruction. *Surg Clin North Am* 1986;**66**:189–200
- 20 Mendelson BC, Masson JK, Arnold PG, Erich JB. Flaps used for nasal reconstruction: a perspective based on 180 cases. *Mayo Clin Proc* 1979;**54**:91–6
- 21 Cranford J, Kadakia S, Berzofsky C. Palatopharyngoplasty for treatment of nasopharyngeal stenosis secondary to extra-laryngeal tuberculosis. *Am J Otolaryngol* 2016;**37**:559–62