



sinonasal cavities were unremarkable. There were no enlarged cervical lymph nodes.

The patient was counseled for an excision biopsy of the lesion for histopathological assessment. The risks of operation were explained, as well as the potential need for secondary surgery and further treatment should histology reveal malignancy.

Based on the clinical appearance of a keratotic horn-shaped lesion with horizontal ridges, the initial working diagnosis was that of a cutaneous horn. The differential diagnoses of a cutaneous horn were considered including seborrheic keratosis, actinic keratosis, and viral warts from human papillomavirus infection. In our case, due to the unusual area of presentation at the nasal vestibule and the enhancement on the CT

scan, a diagnosis of a malignant lesion such as SCC was also considered.

### **Treatment and outcome**

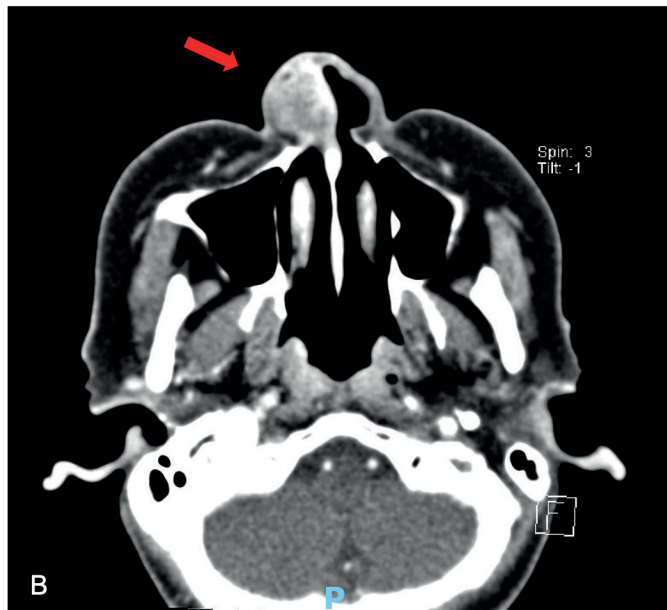
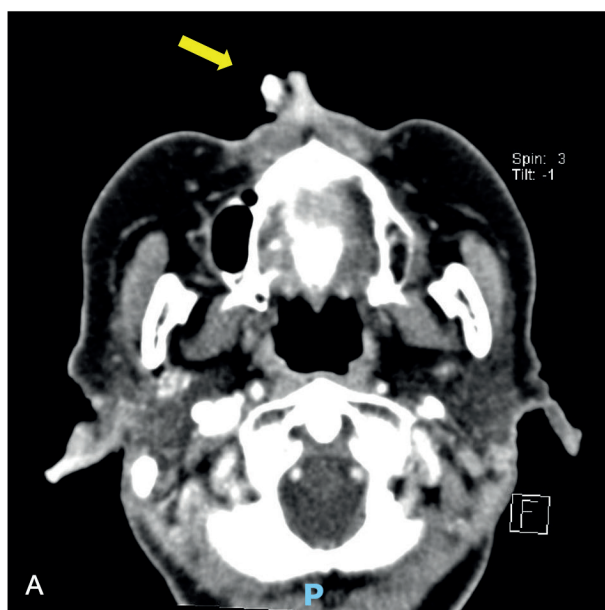
The patient subsequently underwent an excision biopsy of the right nasal mass. Surgery was performed under local anesthesia with sedation as the patient was deemed at high risk for general anesthesia due to severe carotid artery stenosis noted during a pre-operative evaluation.

Intraoperatively, a 4-cm fleshy mass with an external cutaneous horn component was noted to arise from the right nasal septum. The mass lifted off the subperichondrial plane of the nasal septal cartilage easily, with no overt cartilage invasion. The tumor extended anterior up to the mucocutaneous junction of the nasal septum and was not involving the nasal floor. The tumor was excised whole and further margins were taken posteriorly, superiorly, and inferiorly. The anterior margin was not sampled as it was approaching the skin of the columella. The defect was left to close secondarily and nasal packing with a non-absorbable sponge was performed.

The excised specimen measured  $3.7 \times 2 \times 1.4$  cm in total, with one end of the specimen showing a cutaneous horn and the other end showing a soft, grey tumor (Figure 3). Microscopic assessment revealed a verrucous SCC. The lesion was unifocal, with no lymphovascular or perineurial invasion. There was no invasion of the attached fragments of cartilage. The margins sampled were uninvolved except for the superior margin, which showed focal acanthosis and invagination of squamous lining, suspicious of involvement by verrucous proliferation. The final histological diagnosis was a pT1 verrucous SCC.



**Figure 1.** Clinical photograph demonstrated the curved, yellow-brown horn-shaped lesion arising from the right nasal vestibule.



**Figure 2.** CT scan of the neck and paranasal sinuses. (A) Axial view showing the exophytic lesion extending out of the nasal cavity from the right nostril, as demonstrated by the yellow arrow. (B) Axial view showing the lesion at the right naris occupying the right nasal vestibule, as demonstrated by the red arrow.



**Figure 3.** Intraoperative photo showing the gross specimen measuring 3.7 cm in length with different features on two separate ends. The yellow arrow demonstrates the cutaneous horn while the green arrow demonstrates the soft, friable, and verrucous appearing mass.

Post-operatively, her recovery was unremarkable. Her nasal packing was removed on post-operative day 1 and she was discharged with no complications. The pathology was discussed at a multidisciplinary tumor board, which recommended further resection of the superior margin. The patient returned for a clinic visit 2 weeks post-operatively and was doing well with no pain or epistaxis. Her wound was noted to be healing well with mild crusting over the nasal septum. The histological findings and tumor board recommendations were conveyed to the patient and family, but she declined further surgery in view of her age and comorbidities, opting for close observation instead.

Her review 1-month post-surgery revealed no recurrent disease, and she has been planned for 3 monthly clinical examination for the first 2 years from excision.

## Discussion

Cutaneous horn, otherwise known as cornu cutaneum, of the nasal vestibule is a rare site of disease and has only four published case reports in the English literature to date [4-7]. As mentioned, the risk of underlying malignant or pre-malignant lesions is about 16%-39%. It is hence important to recognize and diagnose expediently.

Verrucous carcinoma, also known as Ackerman tumor, is a well-differentiated, low-grade, and slow-growing variant of SCC. It is locally aggressive but has minimal metastatic potential. Pathogenesis of verrucous carcinoma is still undefined, but possible etiologies have been linked to tobacco use, betel nut chewing, and human papillomavirus infection. Verrucous carcinoma has also been shown to develop at sites of chronic inflammation or scarring, or in

patients with long-standing oral lesions such as ulcerative lichen planus and chronic candidiasis. They typically have distinctive histological features, such as blunt projections of well-differentiated epithelium extending into the dermis, sometimes forming sinuses filled with keratin.

Treatment options and outcomes are generally derived from verrucous carcinoma in other subsites, due to the rarity of sinonasal verrucous carcinoma. The primary management of verrucous carcinoma of the oral cavity, which is the commonest site in the head and neck region, is surgery with 1 cm of clinical margins and 5 mm of histological margins [8]. Surgery alone provides a median survival approaching 5 years in a retrospective review of 15 cases of verrucous tumor of the paranasal sinuses by Paleri et al. [9]. In recent years, primary radiotherapy is also considered a viable option, particularly in patients who are poor surgical candidates. A recent systemic review by Echanique et al. [10] has shown reasonable locoregional control and survival outcomes in patients with verrucous carcinoma of the larynx treated with primary radiation. Of 204 patients treated with surgery alone, 86.8% were disease-free at 6 months. Of 59 patients treated with radiotherapy alone, 67.8% were disease-free at 6 months. However, in our case, as a limited biopsy was not feasible and a full excision biopsy was required for the diagnosis of verrucous carcinoma, primary radiotherapy was therefore not offered as a treatment option.

However, radiotherapy in verrucous carcinoma is still an emerging treatment modality and is not without its limitations. Concerns related to primary radiotherapy include purported lower response rates and a potential for anaplastic transformation as reported in the early literature on this treatment modality in other subsites [11]. However, recent literature has refuted this claim and demonstrated the risk of anaplastic transformation negligible. A study by Huang et al. [12] on 62 patients treated with primary radiotherapy showed no cases of anaplastic transformation, and a recent review of all existing literature by Chang et al. [13] showed a negligible risk of anaplastic transformation for the current radiotherapy method as compared to earlier studies. Other complications of primary radiation to the region of the anterior nose include minor complications such as epiphora, nasal dryness, and xerostomia. Other rarer complications include severe soft tissue complications such as nasal bone necrosis and chondronecrosis which can result in saddling of the nose [14,15].

## Conclusion

In conclusion, our report highlights that verrucous carcinoma can occur in atypical sites and can present as a cutaneous horn, which is rare in a non-sun exposed area. It also highlights that although cutaneous horns are commonly benign, a diagnosis of malignancy should always be considered. Extrapolating from the results of treatment of verrucous carcinoma in other subsites, the management

of verrucous tumor of the nasal cavity should primarily be surgical excision with clear margins, although radiotherapy can be considered in patients who are not amenable to surgery.

**What is new?**

The authors’ report highlights that verrucous carcinoma can occur in atypical sites and can present as a cutaneous horn, which is rare in a non-sun exposed area. It also highlights that although cutaneous horns are commonly benign, a diagnosis of malignancy should always be considered. Extrapolating from the results of treatment of verrucous carcinoma in other subsites, the management of verrucous tumors of the nasal cavity should primarily be surgical excision with clear margins, although radiotherapy can be considered in patients who are not amenable to surgery.

**Conflict of interest**

The authors declare that there is no conflict of interest regarding the publication of this article.

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**Consent for publication**

consent has been obtained from the patient for publication.

**Ethical approval**

Ethical approval is not required at our institution to publish an anonymous case report.

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**Summary of the case**

1	<b>Patient (gender, age)</b>	Female, 78-year-old
2	<b>Final diagnosis</b>	Verrucous carcinoma of the nasal septum
3	<b>Symptoms</b>	Cutaneous horn of the right naris
4	<b>Medications</b>	None
5	<b>Clinical procedure</b>	Surgical excision
6	<b>Specialty</b>	Otolaryngology and Head and Neck Surgery