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CASE REPORT

INVERTED PAPILLOMA IN AN APPLICANT TO THE POLISH AIR FORCE UNIVERSITY

Kornelia MŁODZIANOWSKA[1], Małgorzata KLOCEK[1], Ryszard PACHO[1]

[1] Department of Diagnostic Imaging, Military Institute of Aviation Medicine, Warsaw, Poland

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Author's address: K. Młodzianowska, Military Institute of Aviation Medicine, 54/56 Krasinskiego Street, 01-755 Warsaw, Poland, e-mail: kmlodzianowska@wiml.waw.pl

Introduction: Inverted papilloma (IP) is a locally aggressive tumor that most commonly affects the maxillary sinus. Factors implicated in the development of IP include infection with highly oncogenic types of human papillomavirus (HPV). IP is uncommon in young individuals, and an asymptomatic presentation is atypical.

Case Report: An inverted papilloma was detected in an asymptomatic 23-year-old man applying for admission to the Polish Air Force University (Lotnicza Akademia Wojskowa) in Dęblin. The patient was declared medically unfit for professional military service, thereby preventing potential complications associated with exposure to high-altitude conditions.

Conclusions: This case highlights the atypical occurrence of IP in a young, asymptomatic individual. The comprehensive medical examinations that applicants to the Polish Air Force University undergo are essential for protecting them from the consequences of clinically occult disease.

Keywords: medical qualification; paranasal sinus tumors; inverted papilloma; imaging of the facial skeleton

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INTRODUCTION

Inverted papilloma (IP) is a benign but locally aggressive tumor occurring predominantly in the maxillary sinuses and nasal cavity. It usually has a single site of bony attachment, resulting in local bone remodeling and resorption.

The tumor derives its name from its characteristic histological appearance, described as "epithelium inverting into the underlying stroma" [2]. Because the abnormal epithelium extends deep into the stroma, complete excision of IP may be difficult, increasing the risk of recurrence [5]. IP most commonly occurs in middle-aged men (40-60 years of age).

The most frequently reported risk factors include allergy, chronic sinusitis, occupational exposure to chemical agents, cigarette smoking and genetic factors. Its etiology has also been linked to infection with HPV types 6, 11, 16 and 18, with the latter two associated with an increased risk of transformation into squamous cell carcinoma [2,3,9].

CASE REPORT

Patient information

An asymptomatic 23-year-old man applying for admission to the Polish Air Force University in Dęblin presented to the Department of Diagnostic Imaging at the Military Institute of Aviation Medicine in Warsaw for routine imaging examinations, including radiography of the paranasal sinuses and magnetic resonance imaging (MRI) of the brain.

Imaging examinations

X-ray. Radiography was the first screening examination to reveal abnormalities in the paranasal sinuses. The radiographic findings are presented in Figure 1.



Fig. 1. The radiograph shows opacification of both maxillary sinuses. The left maxillary sinus is almost completely opacified, while approximately half of the right maxillary sinus is opacified.

MRI. Screening MRI of the brain revealed abnormalities in the maxillary sinuses and nasopharynx. The corresponding MRI findings are illustrated in Figure 2.

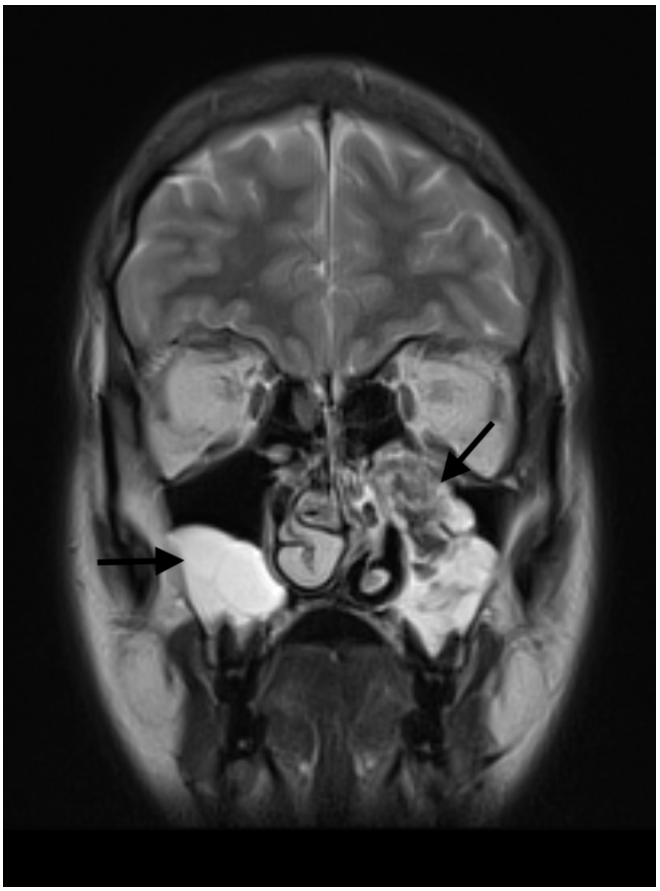


Fig. 2. Coronal T2-weighted magnetic resonance images of the head. A polypoid mass displaying the characteristic "convoluted cerebriform pattern" is visible in the left maxillary sinus and left nasal cavity [1]. A retention cyst is also visible in the right maxillary sinus.

CT. To further characterize the lesion and aid preoperative planning, CT of the paranasal sinuses without and with intravenous contrast administration was ordered at the Institute's Department of Diagnostic Imaging. The CT appearance of the lesion is shown in Figure 3.

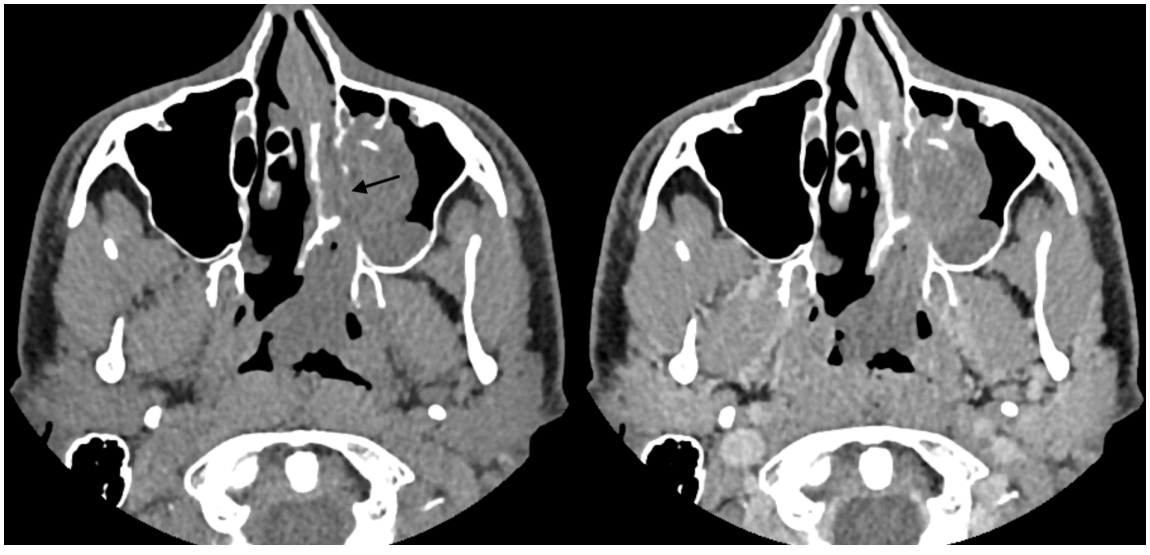


Fig. 3. Axial CT images of the paranasal sinuses, respectively without and with intravenous contrast administration. A solid polypoid lesion showing heterogeneous contrast enhancement is visible in the left maxillary sinus, left nasal cavity and nasopharynx. Destruction of the medial wall of the left maxillary sinus is present (arrow).

Further management

At the Institute's Department of Otolaryngology, the patient underwent left maxillary antrostomy and anterior ethmoidectomy with removal of the polypoid lesion.

Histopathological examination of the excised tissue revealed an inverted papilloma with p16 expression.

DISCUSSION

The symptoms of inverted papilloma are similar to those associated with other upper respiratory tract lesions and include nasal obstruction, pain over the paranasal sinuses and, less commonly, epistaxis [2,7,4]. Given the patient's young age, juvenile nasopharyngeal angiofibroma was the primary differential diagnosis. A malignant tumor of the paranasal sinuses was also considered in the differential diagnosis, whereas choanal polyps were considered less likely because of the heterogeneous contrast enhancement of the lesion.

Expression of p16 in IP cells indicates infection with high-risk oncogenic human papillomavirus.

Recurrence following removal of IP is relatively common. Reported recurrence rates range from 30% to 50% and are influenced mainly by the experience of the surgeon performing the excision and the number of tumor attachment sites [2,4].

The Institute's Department of Otolaryngology recommended follow-up MRI of the paranasal sinuses; however, this examination was not performed at the Institute's Department of Diagnostic Imaging.

CONCLUSIONS

Detection of the inverted papilloma during screening enabled prompt surgical treatment and prevented the patient from proceeding to further testing in the hypobaric chamber and in flight simulators.

This case highlights the importance of screening imaging in preventing paranasal sinus barotrauma in young and apparently healthy applicants to the Polish Air Force University.

AUTHORS' DECLARATION

Study Design: Kornelia Młodzianowska, Małgorzata Klocek, Ryszard Pacho. Statistical Analysis: Kornelia Młodzianowska, Małgorzata Klocek, Ryszard Pacho. Data Collection: Kornelia Młodzianowska, Małgorzata Klocek, Ryszard Pacho. Manuscript Preparation: Kornelia Młodzianowska, Małgorzata Klocek, Ryszard Pacho. The authors declare that there is no conflict of interest.

REFERENCES

1. Avey GD, Koszewski IJ, Agarwal M, Endelman LA, McDonald MA, Burr AR, et al. Sinonasal tumors: what the multidisciplinary cancer care board wants to know. Radiographics. 2024;44(10):e240035. doi:10.1148/rg.240035.
2. Cielińska M, Ścierski W, Sowa P, Lisowska G. Inverted papilloma – aetiology, epidemiology, classification [Brodawczak odwrócony – etiologia, epidemiologia, klasyfikacja]. Otorynolaryngologia. 2016;15(2):80-86 (in Polish).
3. Fulla M, Szafarowski T, Frias-Gomez J, Quiros B, Clavero O, Gomà M, et al. Human papillomavirus and factors associated with recurrence in sinonasal inverted papillomas from Poland and Spain. Head Neck Pathol. 2020;14(3):758-767. doi:10.1007/s12105-019-01125-y.
4. Gotlib T. Surgical management of inverted papilloma of the paranasal sinuses. Polski Przegląd Otorynolaryngologiczny. 2020;9(4):60-66. doi:10.5604/01.3001.0014.6345.
5. Miłoński J, Kuśmierczyk K, Urbaniak J, Pietkiewicz P, Olszewski J. Inverted papillomas of the nose and paranasal sinuses in our own case series [Brodawczaki odwrócone nosa i zatok przynosowych w materiale własnym]. Otolaryngol Pol. 2014;68(5):252-257 (in Polish). doi:10.1016/j.otpol.2014.02.003.
6. Park MJ, Kang SJ, Kim GT, Kim S. Frontal sinus barotrauma in an airliner passenger with undiagnosed allergic rhinitis. Aerosp Med Hum Perform. 2025;96(7):581-585. doi:10.3357/AMHP.6610.2025.
7. Sunkara PR, Saraswathula A, Ramanathan M Jr. Etiology of sinonasal inverted papilloma: an update. Laryngoscope Investig Otolaryngol. 2022;7(5):1265-1273. doi:10.1002/lio2.821.
8. Upadhya IB, Rao K. Sinonasal inverted papilloma: a narrative review. Indian J Otolaryngol Head Neck Surg. 2022;74(Suppl 2):1017-1022. doi:10.1007/s12070-020-02089-0.
9. Viitasalo S, Ilmarinen T, Aaltonen LM, Hagström J, Hytönen M, Hammarén-Malmi S, et al. Sinonasal inverted papilloma: malignant transformation and non-sinonasal malignancies. Laryngoscope. 2023;133(3):506-511. doi:10.1002/lary.30128.