The Journal of Laryngology & Otology
September 2002, Vol. **116,** pp. 730–732

Adenocarcinoma of the ethmoid sinuses: a case of two primary tumours

A. D. Mace, M.R.C.S., A. M. Lale, F.R.C.S., J. W. R. Capper, F.R.C.S.

Abstract
The authors present a case report of a retired furniture worker who initially presented with a mucin-secreting adenocarinoma of the right ethmoid sinus. He underwent surgical resection, leaving the nasal septum intact, and topical treatment with 5-fluorouracil. He remained disease free. Three years after his initial presentation he was found to have a left nasal polyp on routine examination. This subsequently proved to be a second primary adenocarcinoma. A review of the literature has not shown any other cases of a second primary adenocarcinoma of the ethmoid sinuses.

Key words: Ethmoid Sinus; Adenocarcinoma; Occupational Diseases

Introduction

Cancers of the nose and sinuses account for approximately three per cent of head and neck cancers. Many sinonasal malignancies show strong occupational associations including the agricultural, textile, leather and food-preserving industries. In the European population occupation is associated with approximately 39 per cent of all sinonasal cancers in men.[1] In the 1960s Hadfield and Macbeth identified the link between wood dust exposure and adenocarcinoma of the nose and paranasal sinuses.[2–4]

There is characteristically a latency of many years between wood-dust exposure and presentation with the disease.[4]

The authors present a case report of a woodworker who presented with two separate primary ethmoid adenocarcinomas. A literature search did not reveal any other cases of metachronous primary adenocarcinomas of the ethmoid sinus.

Case report

A 75-year-old man presented with a six-month history of right-sided nasal obstruction. He had been exposed to hardwood dust in the furniture industry in High Wycombe. On examination he had a large fleshy polyp filling the right side of the nose. A computed tomography (CT) scan (Figure 1) showed complete opacification of the right paranasal sinuses and nasal airway with no evidence of disease on the left side. His nose was examined under a general anaesthetic and a biopsy taken. Histological examination of the specimen showed a well-differentiation mucin-secreting adenocarcinoma (Figure 2). The patient subsequently underwent a right transantral ethmoid clearance; the nasal septum was not breached by disease nor surgery.

Adjunctive therapy involved weekly 5-fluorouracil packing for six weeks. He was followed up by rigid nasendoscopy in the out-patient department and regular biopsies under a general anaesthetic, these showed no

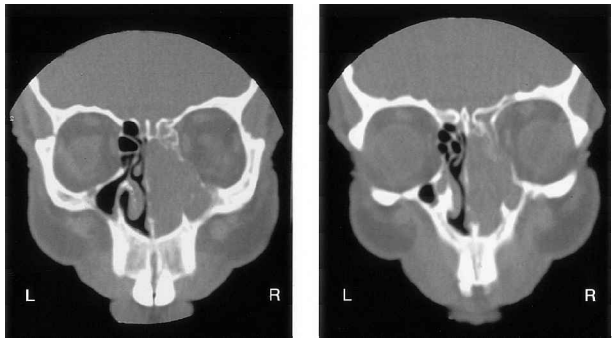

Fig. 1
Coronal computed tomography scans of the paranasal sinuses showing complete opacification of the right nasal passages and paranasal sinuses.

Fig. 2
Histological slide showing well differentiated mucin secreting adenocarcinoma.

From the Department of Otolaryngology, Wycombe General Hospital, High Wycombe, UK.
Accepted for publication: 8 March 2002.

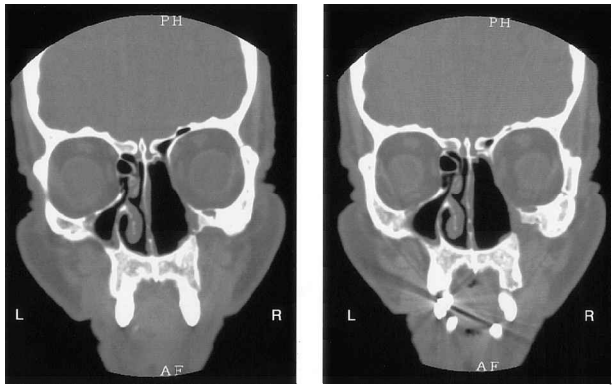

FIG. 3

Coronal computed tomography scans of the paranasal sinuses showing right-sided surgical cavity and normal left nasal anatomy.

evidence of recurrent disease. A CT scan was performed one year after surgery, that showed a clear, disease free cavity on the right and no abnormality on the left. The septum remains intact on CT scan (Figure 3).

Three years after initial presentation, during routine follow-up examination, a small polyp was noted in the left nasal passage lateral to the middle turbinate. A CT scan showed opacification of the left paranasal sinuses and a clear right surgical cavity (Figure 4). A biopsy was taken under general anaesthesia, which showed the polyp to be a mucin-secreting adenocarcinoma, less well differentiated than the right-sided tumour (Figure 5). A left transantral ethmoidectomy was performed and the patient underwent similar adjuvant therapy. It was noted at the time of operation that the nasal septum remained intact.

It is now four years since the patient first presented and a recent examination and biopsy has shown no evidence of recurrent disease on either side.

Discussion

The specific mutagen involved in wood-dust related adenocarcinoma is not known, but combinations of one or more genotoxic substances from the wood itself or wood preservatives stains or paints have been implicated.[5] Wood-dust particles appear to reduce mucociliary clearance and therefore prolong exposure of the sinonasal mucosa to these toxins.[6]

It has been suggested that the pathological process involved in adenocarcinoma of the nasal cavity and paranasal sinuses follows identifiable morphological stages,

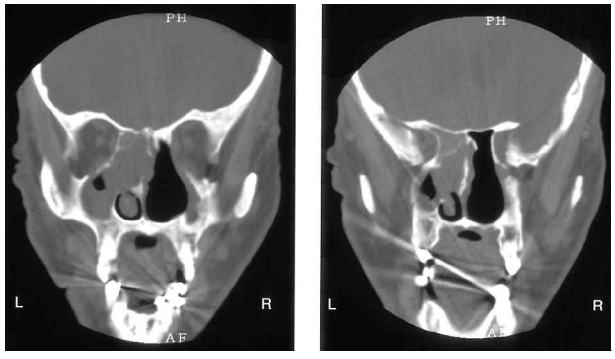

FIG. 4

Coronal computed tomography scans of the paranasal sinuses showing opacification of the left nasal passages and paranasal sinuses with a clear right-sided surgical cavity.

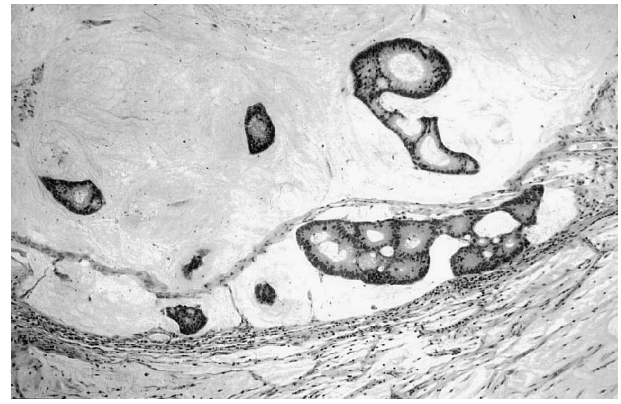

FIG. 5

Histological slide showing a less well differentiated mucin secreting adenocarcinoma.

with metaplasia and dysplasia preceding invasive carcinoma as seen in other toxin-related cancers.[7,8] Using this disease model it is quite possible that the same pathological process could occur in more than one site within the nose and paranasal sinuses following exposure to hardwood dust. The authors suggest that this has occurred in the patient presented.

Ethmoid adenocarcinoma spreads by direct invasion and destruction of surrounding structures; metastasis by lymphatic and haematogenous routes is rare. Local disease is therefore the main cause of morbidity and mortality and this is where intervention is targeted.

Treatment is aimed at local control of the disease, this involves wide surgical excision often followed by radiotherapy. Radiotherapy to the paranasal sinuses is associated with a high incidence of orbital complications such as cataracts, glaucoma, retinopathy and blindness.[9] In the most recently published series of paranasal sinus tumours treated with surgical debulking and radiotherapy 26 serious orbital complications were reported in 19 of 73 patients.[10] This treatment combination has resulted in a reported five-year survival rate of 25–54 per cent for ethmoid sinus cancers in general[11] and 50 per cent for ethmoid adenocarcinoma.[12] Since the early 1980s some centres outside the United Kingdom have combined surgery with a topically applied cytostatic drug with, or without, low-dose irradiation. Knegt *et al.* report a five-year disease free survival rate of 87–100 per cent for ethmoid adenocarcinoma using this treatment combination.[13,14]

This case presentation underlines the importance of long-term follow-up for ethmoid sinus adenocarcinoma. The author suggest that regular examination of the disease-free side should be routine.

Acknowledgements

The authors are grateful for the help received from Professor L. Michaels, Histopathologist, University of London.

References

1 Mannetje A, Kogevinas M, Luce D, Demers PA, Begin D, Bolm-Audorff U, *et al.* Sinonasal cancer, occupation, and tobacco smoking in European women and men. *Am J Industrial Med* 1999;**36**:101–7
2 Macbeth R. Malignant disease of the paranasal sinuses. *J Laryngol* 1965;**79**:592

3 Acheson E, Hadfield E, Macbeth R. Carcinoma of the nasal cavity and accessory sinuses in wood workers. *Lancet* 1967;**1**:311–2
4 Hadfield EH. A study of adenocarcinoma of the paranasal sinuses in woodworkers in the furniture industry. *Ann R Coll Surg Engl* 1970;**46**:301–19
5 Wolf J, Schmezer P, Schroeder H, Scheithauer H, Woeste P. The role of combination effects on the aetiology of malignant nasal tumours in the woodworking industry. *Acta Oto-laryngol Suppl* **535**:1–16
6 Ahman M, Holstrom M, Cynkier I, Soderman E. Work related impairment of nasal function in Swedish woodwork teachers. *Occup Environ Med* 1996;**53**:112–7
7 Boysen M, Voss R, Solberg LA. The nasal mucosa in softwood exposed furniture workers. *Acta Oto-Laryngol* 1986;**101**:501–8
8 Wilhelmsson B, Helquist H, Olofsson J, Klintenberg C. Nasal cuboidal metaplasia with dysplasia. Precursor to adenocarcinoma in wood-dust-exposed workers? *Acta Oto-Laryngol* 1985;**99**:641–8
9 Takeda A, Shigematsu N, Suzuki S, Fujii M, Kawata O, Uno T, *et al*. Late retinal complications of radiation therapy for nasal and para nasal malignancies: relationship between irradiated dose-area and severity. *Int J Radiat Oncol Biol Phys* 1999;**44**:599–605
10 Jansen EP, Keus RB, Hilgers FJ, Haas RL, Tan IB, Bartelink H. Does the combination of radiotherapy and debulking surgery favour survival in paranasal sinus carcinoma? *Int J Radiat Oncol Biol Phys* 2000;**48**:27–35
11 Knegt P. Surgery for paranasal sinus cancer. *Proceedings of 3rd Internaitonal Conference on Head and Neck Cancer*, San Francisco, 26–30 July 1992. *Head Neck Cancer* 1993;**3**:953–60
12 Klintenberg C, Olofson J, Hellquist H, Sokjer H. Adenocarcinoma of the ethmoid sinuses. *Cancer* 1984;**54**: 482–8
13 Knegt P, De Jong P, Van Andel J, De Boer M, Eykenboom W, Van der Schans E. Carcinomas of the paranasal sinuses. *Cancer* 1985;**56**:57–62
14 Knegt PP, Ah-See KE, vd Velden LA, Kerrebijn J. Adenocarcinoma of the ethmoid sinus complex: surgical debulking and topical fluorouracil may be the optimal treatment. *Arch Otolaryngol Head Neck Surg* 2001;**127**: 141–6

Address for correspondence:
Mr J. W. R. Capper, F.R.C.S.,
Department of Otolaryngology,
Wycombe General Hospital,
Queen Alexandra Road,
High Wycombe, HP11 2TT, UK.

Mr A. D. Mace takes responsibility for the integrity of the content of the paper.
Competing interests: None declared
