Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Case Report

Inverted papilloma of frontal sinus with intracranial extension

Sharad Mohan^a, Lt Col Satish Nair^{b,*}, Lt Col Manish Sharma^c,
Col Ajith Nilakantan^d, Akshat Malik^a

^a Resident (ENT), Army Hospital (R & R), Delhi Cantt 10, India

^b Classified Specialist (ENT), Army Hospital (R & R), Delhi Cantt 10, India

^c Classified Specialist (Neurosurgery), Army Hospital (R & R), Delhi Cantt 10, India

^d Senior Advisor (ENT), Army Hospital (R & R), Delhi Cantt 10, India

ARTICLE INFO

Article history:

Received 19 March 2013

Accepted 1 October 2013

Available online 16 December 2013

Keywords:

Inverted papilloma

Intracranial extension

Craniofacial resection

transformation. We present a rare case of IP arising from frontal sinus with extension into anterior cranial fossa treated with craniofacial resection.

Case report

A 28-year-old male patient reported with suffering of 2-year history of right sided nasal blockage, frontal headache and hyposmia. There was no history of epistaxis, rhinorrhoea, ophthalmologic or neurologic symptoms. On anterior rhinoscopy and nasal endoscopy a pinkish polypoidal mass was visualised in right middle meatus which was sensitive to touch (Fig. 1). There was no evidence of proptosis, diplopia, cranial nerve palsy or palpable cervical lymphadenopathy. NCCT PNS revealed mass in right frontal recess extending into nasal cavity with features suggestive of mucocoele in frontal sinus with erosion of posterior table of frontal sinus with no intracranial extension (Fig. 2). MRI PNS confirmed the findings of CT scan (Fig. 2a). A biopsy of mass was undertaken and histopathological examination was suggestive of inflammatory polyp with no fungal elements seen.

A diagnosis of benign inflammatory nasal polyp with frontal mucocoele (right) was made and patient underwent endoscopic clearance of polypoid tissue from right frontal recess with drainage of right frontal mucocoele. HPE of resected specimen showed inverted papilloma (Fig. 3). As the surgery was undertaken for a benign lesion and histopathological diagnosis was of a benign tumour, it was planned to review

Introduction

Inverted papilloma (IP) is a benign epithelial neoplasia that accounts for 0.5–4% of all primary nasal tumours.¹ It is characterised by an endophytic or inverted growth pattern of epithelium with ramifications into the underlying stroma rather than outward proliferation from the surface with an intact epithelial basement membrane.² It affects all ages, most commonly males (M:F 3:1–5:1) in the fifth to the seventh decades of life (average age 53 years).^{1,3} The most frequent sites are the lateral nasal wall near the middle turbinate or ethmoid recesses and the maxillary sinuses. Although a benign lesion, IP is characterised by its relatively high recurrence rate, local aggressiveness and potential for malignant

* Corresponding author. Tel.: +91 8130667567.

E-mail address: aachku@gmail.com (S. Nair).

0377-1237/\$ – see front matter © 2013, Armed Forces Medical Services (AFMS). All rights reserved.

<http://dx.doi.org/10.1016/j.mjafi.2013.10.009>

Fig. 1 – Endoscopic view of polypoidal mass in right middle meatus.

the patient after 4 weeks with repeat imaging to evaluate completeness of excision. Three weeks post-operatively patient had two episodes of generalized tonic clonic seizures. CEMRI revealed solid enhancing lesion (1.5×2 cm) right frontal sinus with extension through defect in posterior table of frontal sinus into anterior cranial fossa and frontal lobe with abscess (2×1.5 cm) in right frontal lobe causing midline shift of 7 mm to right (Fig. 4).

Patient was reviewed jointly by neurosurgeon and otolaryngologist and was taken up for right frontal craniotomy and excision of tumour and abscess with clearance of nasal part endoscopically (Fig. 5a–d). Right sided frontal craniotomy revealed 1.5×2 cm lesion eroding posterior wall of frontal sinus and extending to the frontal lobe with a 2×2 cm well encapsulated abscess surrounding the tumour in the frontal lobe. Complete excision of tumour along with the abscess was carried out with the nasal clearance of tumour done endoscopically. Dural defect was closed using galeal flap. HPE

Fig. 2 – Coronal CT scan showing mass in right frontal recess with features suggestive of mucocoele in frontal sinus eroding posterior table of frontal sinus. (a) Coronal and axial cuts of MRI PNS showing mass in right nasal cavity with extension to frontal recess and erosion of posterior table of frontal sinus.

Fig. 3 – Histopathology showing characteristic features of inverted growth of epithelium.

of resected specimen showed inverted papilloma with papilliform surface composed of non keratinizing squamous and transitional cell like epithelium with scattered intra-epithelial microabscesses. Xanthomatous changes and dense fibrous tissue was also seen. Post op period was uneventful. Presently patient is asymptomatic on antiepileptics and under constant review.

Fig. 4 – CEMRI showing lesion in the right frontal sinus extending into anterior cranial fossa and abscess in right frontal lobe.

Discussion

IP is an uncommon, slow growing, locally invasive, benign primary nasal tumour which generally presents as unilateral nasal mass. WHO defines Schneiderian papillomas as a benign epithelial neoplasia composed of well differentiated columnar or ciliated respiratory epithelium with various degree of squamous differentiation. These can be classified into 3 types: exophytic, inverted and oncocytic (cylindrical).^{1–3} It was first described by Ward and named Schneiderian papilloma in honour of C Victor Schneider, who in 1660s identified nasal mucosa origin from ectoderm.⁴ In 1938, Ringertz coined the term “Inverted papilloma” based on its histological findings of inversion of epithelium into underlying stroma.⁵ It is a benign but locally aggressive tumour having high chance of recurrence and high risk of association with malignancy. In situ hybridization and polymerase chain reaction have detected Human Papilloma virus (HPV) in up to 86% of inverted papillomas.⁶ The commonest site of origin of this tumour is lateral wall of nasal cavity, followed by medial wall of maxillary sinus and the origin from sphenoid and frontal sinus is rare. The tumour may extend beyond nasal fossa and paranasal sinuses into nasopharynx, pterygoid fossa, nasolacrimal duct, retrobulbar region and brain in order of frequency. Incidence of inverted papilloma leading to intracranial extension is rare with a reported incidence of 1.8–2% in literature.⁷

The present study is a rare case of IP involving frontal sinus associated with mucocele with extension into anterior cranial fossa after destruction of posterior table of frontal sinus. As per PubMed database, there are only 17 reports of IP of frontal sinus with intracranial extension. They usually occur in females with a mean age of 49.2 years (range 23–92 years). They are also associated with mucocele (22%) and recurrent disease (60%).⁸ Intracranial extension in absence of malignancy is usually seen in recurrent cases especially when the lesion involves the cribriform plate, frontal sinus, fovea ethmoidalis and orbits. The higher incidence of intracranial extension in recurrent IP is due to the technical difficulties in obtaining clearance in these anatomical areas.¹ Anterior cranial fossa invasion occurs after destruction of posterior table of frontal sinus or the roof of nasal cavity.

Treatment of choice for IP is wide resection using either an open or endoscopic approach depending upon location and extent of tumour, expertise of surgeon and available technology. Intracranial inverted papilloma can be effectively controlled with combined team approach of neurosurgeon and otolaryngologist with craniofacial resection. Intracranial intradural involvement of IP has a poor prognosis regardless of treatment.⁹ Adjuvant radiation therapy with or without chemotherapy is reserved only for patients with multiple recurrences, inoperable or incompletely resectable tumours or those associated with malignancy.^{1,10}

Conclusion

Benign inverted papilloma with intracranial extension, in the absence of malignancy is uncommon and can be effectively

Fig. 5 – (a) Tumour in anterior cranial fossa extending to frontal lobe. (b) Tumour and abscess excision from frontal lobe. (c) Clearance of tumour from frontal sinus. (d) Final defect after tumour removal.

managed by craniofacial resection. Long term follow up of the patient is mandatory as there is high incidence of recurrence.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Anari S, Carrie S. Sinonasal inverted papilloma: narrative review. *J Laryngol Otol*. 2010 Jul;124(7):705–715.
2. Sandison A. Common head and neck cases in our consultation referrals: diagnostic dilemmas in inverted papilloma. *Head Neck Pathol*. 2009 Sep;3(3):260–262.
3. Barnes L, Tse LLY, Hunt JL. Inverted papilloma (Schneiderian papilloma, inverted type). In: Barnes L, Eveson JW, Reichart P, Sidransky D, eds. *WHO Classification of Tumours. Pathology and Genetics of Head and Neck Tumours*. Lyon: IARC Press; 2005:28–31.
4. Kramer R, Som ML. True papilloma of nasal cavity. *Arch Otolaryngol*. 1935:22–43.
5. Ringertz N. Pathology of malignant tumors arising in the nasal and paranasal cavities and maxilla. *Acta Otolaryngol (Stockh)*. 1938;27(suppl):31–42.
6. Hwang CS, Yang HS, Hong MK. Detection of human papillomavirus (HPV) in sinonasal inverted papillomas using polymerase chain reaction (PCR). *Am J Rhinol*. 1998;12(5):363–366.
7. Lawson W, Ho BT, Shaari CM, Biller HF. Inverted papilloma: a report of 112 cases inverted papilloma: a report of 112 cases. *Laryngoscope*. 1995;105(3 Pt 1):282–288.
8. Wright EJ, Chernichenko N, Ocal E, Moliterno J, Bulsara KR, Judson BL. Benign inverted papilloma with intracranial extension: prognostic factors and outcomes. *Skull Base Rep*. 2011;1(2):145–150.
9. Vural E, Suen JY, Hanna E. Intracranial extension of inverted papilloma: an unusual and potentially fatal complication. *Int Head Neck*. 1999;21:703–706.
10. Acevedo-Henao CM, Talagas M, Marianowski R, Pradier O. Recurrent inverted papilloma with intracranial and temporal fossa involvement: a case report and review of the literature. *Cancer Radiother*. 2010 Jun;14(13):202–205.