Lateral rhinotomy vs mid-facial degloving for T3 inverted papilloma of nose and paranasal sinus

V Sharma and K Koirala

Department of ENT and Head Neck surgery, Manipal Teaching Hospital, Pokhara, Nepal

Corresponding author: Dr. Vishal Sharma, Assistant Professor, Dept of E.N.T., Manipal College of Medical Sciences and Teaching Hospital, Phulbari Campus, Pokhara, Nepal; e--mail address: vishal_sharma_ent@yahoo.com

ABSTRACT

Inverted papillomas are rare, benign epithelial tumours of the nasal cavity and paranasal sinuses. To evaluate recurrence rates and rates of malignant transformation by lateral rhinotomy and midfacial degloving approaches for inverted papillomas. Retrospective case series, done at Manipal Teaching Hospital, Pokhara, over an 8-year period from 2000 to 2008. We did a review of 20 cases of T3 inverted papilloma. All patients initially underwent nasal biopsy for confirmation of the diagnosis and pre-operative C.T. scan for tumour staging. 10 patients who had a medial maxillectomy by lateral rhinotomy approach were assigned group I, while 10 who had a medial maxillectomy by mid-facial degloving approach were placed under group II. There were 7 males and 3 females in both group I and group II. Age ranged from 50 to 70 years with a mean age of 62.3 years for group I and 59.8 years for group II. Commonest presenting complaint was unilateral nasal obstruction (60.0% in group I, 80.0% in group II). The mean follow up period was 19.5 months for group I and 16.5 months for group II. Recurrence rate and malignant transformation was 10.0% each for both groups. There was no significant difference between the 2 groups in these findings. Lateral rhinotomy and mid-facial degloving approaches have similar recurrence rates in T3 inverted papillomas but mid-facial degloving has the advantage of no external facial scar and bilateral exposure.

Key words: Inverted papilloma, lateral rhinotomy, midfacial degloving

INTRODUCTION

Inverted papilloma or Schneiderian papilloma is a locally aggressive sino-nasal tumour that arises from the lining respiratory membrane. Ward[1] was credited for reporting the first case of inverted papilloma in 1864. It constitutes 0.5-4.0% of all primary nasal tumours and has a peak incidence in the fifth and sixth decades of life.[2] There is a usual male to female predominance in the ratio of 3 to 1. The aetiology of this tumour is unknown. Possible theories include proliferation of nasal polyps, allergy, chronic inflammation and human papilloma viral infection.[3] Common presenting symptoms are unilateral nasal obstruction (50.0%), nasal discharge (20.8%) and epistaxis (16.6%).[2] Patient can also present with a unilateral bleeding nasal mass (Fig. 1). Lateral nasal wall and middle turbinate are commonly involved by inverted papilloma in 93.0% of cases.[2] Maxillary sinus is most commonly affected by the tumour (48.0%), followed by ethmoid sinus (46.0%), sphenoid sinus (12.0%) and frontal sinus (8.0%).[2]

Grossly, the lesion is firm, polypoid and vascular. Ringertz[4] was the first to identify the characteristic histological feature of inversion of neoplastic epithelium into the underlying connective tissue stroma. The local aggressiveness, high rate of recurrences (12.0-28.0%)[2,5-7] and malignant transformation (7.0-15.0%)[2,5-7] are the clinical properties of the inverted papilloma that lead most surgeons to advocate radical surgical removal of these tumours. Surgical technique of choice for advanced inverted papillomas is en bloc medial maxillectomy and ethmoidectomy as described by Sessions[8] in 1977.

Krouse[9] in 2000 proposed a C.T. scan guided staging of inverted papillomas. In stage I, the tumour is confined to the nasal cavity with no evidence of malignancy. In stage II, the tumour involves the osteomeatal complex, ethmoids and or medial wall of maxillary sinus without any evidence of malignancy. In stage III, the tumour involves the inferior, superior, lateral or anterior wall of maxillary sinus, sphenoid and or frontal sinus without evidence of malignancy. In stage IV, the tumour extends beyond the nasal cavity or paranasal sinuses or the tumour is associated with malignancy.

Objectives: 1. To review our experience of the management of inverted papillomas. 2. To evaluate recurrence rates, rates of malignant transformation, and outcomes of treatment, by lateral rhinotomy and midfacial degloving approaches.

MATERIALS AND METHODS

We did a retrospective review of 20 patients of inverted papilloma who presented to Manipal Teaching Hospital,

Table-1: Comparison between group I and II

	Lateral Rhinotomy (Group I)	Mid-facial degloving (Group II)	*p* Value
Age			
50-55 years	2	2	0.55
56-60 years	2	4	
61-65 years	3	3	0.45
66-70 years	3	1	
Average age	62.3 years	59.8 years	
Sex			
Male	7	7	0.68
Female	3	3	
Presenting complaint			
U/L Nasal obstruction	6	8	0.63
U/L Nasal discharge	2	1	
Epistaxis	2	1	1.00
Others	0	0	
Tumour recurrence	1	1	0.83
Malignancy	1	1	

Pokhara, Nepal, a tertiary referral centre, over an 8-year period from 2000 to 2008.

Inclusion Criteria: 1. Patients having biopsy proven inverted papilloma who underwent surgical removal by lateral rhinotomy or mid-facial degloving. 2. Patients reviewed at ≥ 3 months of follow up of the operation. 3. Patients with tumour staging T3 by pre-operative C.T. scan.

Exclusion Criteria: 1. Patients with inverted papilloma who underwent surgical removal by other techniques. 2. Patients reviewed at < 3 months of follow up of the operation. 3. Patients with tumour staging T1, T2 or T4 by pre-operative C.T. scan.

Selected patients were divided into two groups: Group I: Patients underwent surgical removal by lateral rhinotomy (n = 10 patients). Group II: Patients underwent surgical removal by mid-facial degloving (n = 10 patients)

Procedure: All patients initially underwent nasal biopsy for confirmation of the diagnosis and a pre-operative C.T. scan for tumour staging (photo 2). All patients were operated under general anaesthesia.

Fig. 1. Unilateral bleeding nasal mass

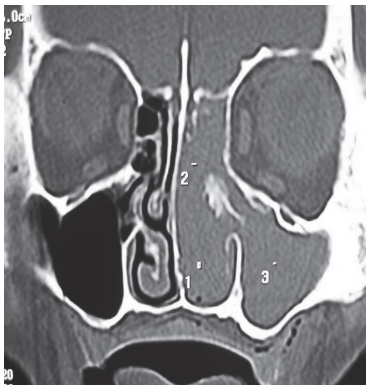

Fig. 2. Pre-operative C.T. scans showing T3 inverted papilloma

Lateral rhinotomy approach : It was described by Moure in 1902. Incision starts under medial end of eyebrow, extending inferiorly, between medial canthus and nasal dorsum, along the deep nasal-cheek groove adjacent to nasal ala. To achieve en bloc resection, osteotomies are performed through the inferior and anterior aspects of the medial wall of the maxilla, through the medial wall of the orbit just inferior to the fronto-ethmoid suture line, and through the inferior orbital rim and orbital floor. By connecting these osteotomies, the specimen can be mobilized by using a heavy, curved Mayo scissors. To avoid epiphora, the lacrimal sac is marsupialized by incising it vertically and its edges sewn to the adjacent tissues.

Mid-facial degloving approach: It was described by Casson in 1974. This approach consists of lifting the soft tissue from the mid portion of the face by means of a sub-labial incision. Four types of incisions are required in mid-facial degloving approach: 1. Bilateral inter-cartilaginous incisions. 2. Complete septo-columellar transfixion incision. 3. Bilateral sub-labial incisions from one maxillary tuberosity to other maxillary tuberosity. 4. Bilateral pyriform aperture incisions extending to the vestibule. These incisions facilitate exposure of the pyriform aperture, lateral nasal wall and medial orbital wall.

The statistical analysis was done by Fisher's exact test. The 2 groups were compared in terms of age, sex, presenting complaint, tumour recurrence and malignant transformation. A *p* value of < 0.05 was considered significant.

RESULTS

The results are summarized in Table-1. There were 7 males and 3 females in both group I and group II which confirmed the historical male preponderance. Age ranged from 50 to 70 years with a mean age of 62.3 years for group I and 59.8 years for group II. Commonest presenting complaint was unilateral nasal obstruction (60.0% in group I, 80.0% in group II), followed by epistaxis (20.0% in group I, 10.0% in group II) and nasal discharge (20.0% in group I, 10.0% in group

II). Left nasal cavity was involved in 13 cases and right in 7 cases. The follow up period ranged from 3 to 36 months with a mean of 19.5 months for group I and 16.5 months for group II. The tumour recurrence rate was 10.0% for both groups. The incidence of malignant transformation was also 10.0% in both groups. There was no significant difference between the 2 groups in terms of age distribution, sex, presenting complaints, recurrence and malignant transformation (Table-1 for *p* values).

DISCUSSION

En bloc medial maxillectomy and ethmoidectomy provides complete visualization of all tumour margins while preserving the orbital rim, eye, nasal pyramid, and lacrimal apparatus. The medial maxillectomy can be accomplished via either lateral rhinotomy or mid-facial degloving techniques. The morbidities associated with a lateral rhinotomy incision are epiphora, chronic dacrocystitis, transient diplopia and Eustachian tube dysfunction. None of our patients had these complications. Advantages of mid-facial degloving approach include no external scarring and simultaneous bilateral exposure. The primary limitation of the mid-facial degloving approach is when surgery is required for more extensive tumours that invade the supra-orbital ethmoid cells or the frontal sinus, which require a separate incision. Introduction of high resolution C.T. scan permits identification of a select group of patients with limited tumours, who may be operated by a more conservative trans-nasal endoscopic medial maxillectomy. This endoscopic approach is contraindicated for Krouse's stage 3 and stage 4 inverted papillomas. Hence, it was not used for patients in this series.

Lawson *et al*[2] in a series of 160 patients of inverted papilloma in 2003 reported an overall recurrence of 18% in 112 patients of lateral rhinotomy and 12% in 30 patients of endoscopic surgery. Overall malignant transformation rate was 7%. Yoon *et al*[5] in 2002 reported a series of 96 patients with a recurrence rate of 14.3% using lateral rhinotomy and a malignant transformation rate of 11.5%. Mirza *et al* [6] in 2007 treated 65 patients with recurrence rates of 12.8 per cent for endoscopic procedures and 17.0 per cent for lateral rhinotomy. There was an 11.0% incidence of malignant transformation. Thorp *et al*[7] in 2001 did a review of 53 cases with an overall recurrence rate of 28.0% and a malignant association of 9.0%. Waitz and Wigand[10] in 1992 reported a series of 35 patients who underwent surgery by an intranasal endoscopic approach with the recurrence rate of 17.0%. Some authors prefer an endoscopic approach for all stages of inverted papilloma and reserve external approach for recurrent tumour.[11-13] Peng and Har-El[14] in 2006 reported 98 medial maxillectomy procedures via mid-facial degloving for inverted papillomas, with a small recurrence rate of 2.1%.

Long term follow up is crucial as tumour recurrence may be associated with incidence of malignancy.[2] It is mandatory to prospectively follow the patients every 4 months during the first postoperative year and then every 6 months for at least 4 years.

Limitations: The results should be interpreted with caution due to the small study size. Our data might not reflect the true scenario as most patients defaulted long term follow up.

Patients with inverted papilloma should undergo radical surgery to remove all mucosal disease. Both lateral rhinotomy and mid-facial degloving approaches have similar recurrence rates in T3 inverted papillomas but mid-facial degloving approach has the advantage of no external facial scar and bilateral exposure.

REFERENCES

1. Ward N. A mirror of the practice of medicine and surgery in the hospitals of London. *London Hosp Lancet* 1854; 2: 480-2.
2. Lawson W, Kaufman M, Biller HF. Treatment outcomes in the management of inverted papilloma: an analysis of 160 Cases. *Laryngoscope* 2003; 113: 1548-56.
3. Weber RS, Shillitoe EJ, Robbins KT *et al*. Prevalence of human papillomavirus in inverted nasal papillomas. *Arch Otolaryngol Head Neck Surg* 1988; 114: 23-6.
4. Ringertz N. Pathology of malignant tumours arising in the nasal and paranasal cavities and maxilla. *Acta Otolaryngol (Stockh)* 1938; 27 (Suppl): 31-42.
5. Yoon JH, Kim CH, Choi EC. Treatment outcomes of primary and recurrent inverted papilloma: An analysis of 96 cases. *J Laryngol Otol* 2002; 116: 699-703.
6. Mirza S, Bradley PJ, Acharya A, Stacey M, Jones NS. Sinonasal inverted papillomas: recurrence, and synchronous and metachronous malignancy. *J Laryngol Otol* 2007; 121: 857-64.
7. Thorp M, Oyarzabal-Amigo M, du Plessis J, Sellars S. Inverted Papilloma: A Review of 53 Cases. *Laryngoscope* 2001; 111: 1401-5.
8. Sessions RB, Larson DL. En bloc ethmoidectomy and medial maxillectomy. *Arch Otolaryngol* 1977; 103: 195-202.
9. Krouse JH. Development of a staging system for inverted papilloma. *Laryngoscope* 2000; 110: 965-8.
10. Waitz G, Wigand ME. Results of endoscopic sinus surgery for the treatment of inverted papillomas. *Laryngoscope* 1992; 102: 917-22.
11. Baruah P, Deka RC. Endoscopic management of inverted papillomas of the nose and paranasal sinuses. *Ear Nose Throat J* 2003; 82: 317-21.
12. Busquets JM, Hwang PH. Endoscopic resection of sinonasal inverted papilloma: a meta-analysis. *Otolaryngol Head Neck Surg* 2006; 134: 476-82.
13. Lee TJ, Huang SF, Lee LA *et al*. Endoscopic surgery for recurrent inverted papilloma. *Laryngoscope* 2004; 114: 106-12.
14. Peng P, Har-El G. Management of inverted papillomas of the nose and paranasal sinuses. *Amer J Otolaryngol* 2006; 27: 233-7.