

## Squamous cell carcinoma of the nasal vestibule

PIYUSH PATEL, F.R.C.S.,\* R. TIWARI, M.D., M.S., PH.D., F.R.C.S.,\* A. B. M. F. KARIM, M.D., PH.D., F.R.C.R.,\*\* J. J. P. NAUTA, M.Sc.,\* G. B. SNOW, M.D., PH.D. (Amsterdam, The Netherlands)

### Abstract

We reviewed 30 patients with squamous cell carcinoma of the nasal vestibule to present our experience of their management and to evaluate the prognostic factors that may influence their outcome. For T<sub>1</sub> lesions radiotherapy remains the treatment of choice, because of the superior cosmetic result. Fifteen (68 per cent) out of 22 patients with T<sub>2</sub> lesions were treated with primary radiotherapy. Surgery however, was eventually required in 16 (72 per cent) out of 22 patients, either as a primary treatment (seven patients) or as salvage surgery (nine patients). For the larger T<sub>3</sub> lesions the treatment of choice is surgery followed by post-operative radiotherapy where appropriate. Regional nodal metastases at the time of presentation were a significant indicator of local and regional recurrence and of prognosis. The cause specific five-year survival for patients with an uninvolved neck (22 patients) was 100 per cent compared with 38 per cent for patients with nodal metastases at presentation (eight patients). Elective treatment for uninvolved regional nodes is not considered necessary.

### Introduction

Squamous cell carcinoma of the nasal vestibule is uncommon, and behaves differently from carcinoma arising from the neighbouring areas of the nasal cavity and paranasal sinuses. Early reports (Deutsch, 1966; Shiffman, 1979), in which the results were not analysed separately from carcinomas arising from the nasal cavity, suggested this cancer has a poor prognosis. Recently, however, several publications have appeared which show that carcinoma of the nasal vestibule carries a far more favourable prognosis than carcinoma of the posterior nasal cavity or the paranasal sinuses, and a slightly worse prognosis than carcinoma of nasal skin (Million *et al.*, 1984; Wong *et al.*, 1986).

*Surgical anatomy:* The nasal vestibule extends posteriorly from the anterior nares to the limen nasi which is a ridge across the roof of the nasal cavity formed by the lower border of the upper lateral cartilage. Its lateral wall is formed by the ala nasi, and the medial wall consists of the lower part of the cartilagenous septum, the membranous septum, and the columella. Superiorly the dome of the nasal vestibule is formed by the junction of the lateral and medial walls and the floor of the nose between these walls forms the inferior extent of the vestibule. It is lined with squamous epithelium containing hair follicles and sebaceous glands. Squamous cell carcinoma is the most common type of malignant tumour of this area.

The lymphatic drainage is primarily to the submandibular, pre-auricular, nasolabial and facial lymph nodes and occasionally to the subdiaphragmatic and the submental nodes (Goepfert *et al.*, 1974; Haynes *et al.*, 1974; Wang, 1976; Mendenhall *et al.*, 1984). The drainage is essentially ipsilateral but may be bilateral, especially when the tumour extends to the base of the columella, the floor of

the nasal vestibule and the adjacent portion of the upper lip (Goepfert *et al.*, 1974).

The purpose of this paper is to present our experience with the management of nasal vestibular carcinoma at the department of Otorhinolaryngology and Head and Neck Surgery at the Free University Hospital, Amsterdam and to evaluate the results and the prognostic factors which may influence the outcome.

### Materials and methods

A retrospective analysis of all patients with histologically proven squamous cell carcinoma of the nasal vestibule treated at the Free University Hospital, Amsterdam between 1975 and 1990 was performed. A total of 31 carcinomas of the nasal vestibule were treated, 30 with squamous cell carcinomas, and only one with a basal cell carcinoma. During the same period, 80,000 new cases with ear nose or throat pathology were treated, of which 4797 were tumours in the head and neck region. This gives a prevalence of 0.04 per cent of all pathologies and 0.62 per cent of all tumours of the head and neck. Of the 30 patients with squamous cell carcinomas, 24 (80 per cent) were male and six (20 per cent) were female. The age of the patients ranged from 44 years to 80 years with a median age of 65 years. All patients except two were white Caucasians; one was Creole and one Indonesian in origin. There appeared to be a comparatively lower incidence in coloured races, with a white male preponderance similar to that noted in other publications (Goepfert *et al.*, 1974; Schaefer *et al.*, 1980).

In the absence of an UICC classification for carcinoma of the nasal vestibule, the primary tumour was staged retrospectively using the system proposed by Wang (1976) (Table I). The lymph node metastases were classi-

Departments of Otolaryngology\* and Radiotherapy,\*\* Free University Hospital, Amsterdam, The Netherlands.

Accepted for publication: 19 December 1991.

TABLE I  
PRIMARY TREATMENT BY TUMOUR STAGE

T <sub>1</sub>	The lesion is limited to the nasal vestibule, relatively superficial, involving one or more sites within.
T <sub>2</sub>	The lesion has extended from the nasal vestibule to its adjacent structures, such as the upper nasal septum, upper lip, philtrum, skin of the nose and/or nasolabial fold, but not fixed to the underlying bone.
T <sub>3</sub>	The lesion has become massive with extension to the hard palate, buccogingival sulcus, large portion of the upper lip, upper nasal septum, turbinate and/or adjacent paranasal sinuses, fixed with deep muscle and bone involvement.

fied according to the current UICC classification (UICC, 1987). The tumour and nodal status of the patients at presentation is shown in Table II, and the modality of primary treatment in Table III.

The general treatment policy was to treat the early T<sub>1</sub> lesions with primary curative radiotherapy. This was administered with a combination of orthovoltage radiotherapy up to a dose of 7000 cGy and brachytherapy up to a dose of 2000 cGy. T<sub>2</sub> lesions in the main were perhaps better suited for primary surgery, but in view of the aesthetic consequences, it was often considered preferable to treat with primary radiotherapy and reserve surgery for salvage of residual or recurrent tumour. Large T<sub>3</sub> tumours with cartilage and/or bony invasion were treated with surgical resection and post-op radiotherapy where indicated.

The results were evaluated in relation to the tumour stage, the presence of nodal metastases, and to the histological grading of the tumour as well as the mode of primary treatment. The survival and relapse free rates were calculated using the Kaplan-Meier method (Kaplan *et al.*, 1958), and the results compared using the log-rank test for significance.

## Results

All five patients with a T<sub>1</sub> tumour received curative radiotherapy to the primary site. Only one of these patients presented with nodal metastases, and was treated with 4000 cGy to the neck during radiotherapy to the primary. This was followed by a radical neck dissection. All five patients are alive with no evidence of disease. Their follow-up ranges from one to 10 years (median follow-up 31 months). The five-year cause specific survival for this group was 100 per cent. One patient developed a local recurrence six months following primary treatment with radiotherapy, and was successfully treated with salvage surgery in the form of partial amputation of the nose with reconstruction using bilateral nasolabial flaps.

Of the 22 patients with a T<sub>2</sub> tumour, 15 patients (68 per cent) were treated primarily with radiotherapy, six (27 per cent) with surgery and one (5 per cent) with surgery followed by postoperative radiotherapy. Of the 15 patients treated with radiotherapy, nine patients (60 per cent) later required salvage surgery. Of the six patients treated with primary surgery, four had a partial amputation of the nose and the two required a total rhinectomy. The patient who received combined treatment had a partial nose amputation with bilateral radical neck dissections followed by post-operative radiotherapy.

The five-year cause specific survival of patients with a T<sub>2</sub> tumour was 76 per cent and was unchanged at 10 years.

Eleven (50 per cent) out of the 22 patients with T<sub>2</sub> tumours developed a local recurrence. Nine out of these 11 had primary treatment with radiotherapy, one with surgery, and one with surgery and post-operative radiotherapy. Of the 11 patients with a local recurrence, one patient developed late nodal metastases, four a regional recurrence and one patient developed distant metastases. Five patients with local recurrence were all initially treated with radiotherapy and were successfully controlled by salvage surgery. The patient with local recurrence who also later presented with nodal metastases was successfully treated with total rhinectomy and radical neck dissection. Of the four patients with a regional recurrence, three succumbed to the disease. The fourth patient, who had initially been treated with primary radiotherapy, had local and nodal recurrences successfully treated subsequently with partial assumption of the nose and radical neck dissection. The patient who developed distant metastases had originally been treated with surgery in the form of a partial amputation of the nose with bilateral suprahyoid neck dissections. He did well initially, but within two years developed lymphangitis carcinomatosa around the previous resection site, and cerebral metastases. He died within a few months.

All the three patients with a T<sub>3</sub> tumour had bone involved; two of these had no neck nodes on presentation. One was treated with a partial amputation of the nose and a right ethmoidectomy (because of an involvement of the middle turbinate). The other had a partial amputation of the nose with wide excision of the cheek and removal of the anterior wall of the maxillary sinus and the lateral wall of the nose, followed by post-operative radiotherapy. They have both been followed up for more than five years and are free of disease. The third patient presented with a T<sub>3</sub>N<sub>2</sub> lesion and received combined treatment with total rhinectomy, partial upper jaw resection and bilateral neck dissections followed by post-operative radiotherapy. At the time of writing, he had been followed up for nine months and had no evidence of recurrent disease.

As a majority (22) of the patients in this study had a T<sub>2</sub> tumour, with only five patients with T<sub>1</sub> and three with T<sub>3</sub> tumours, it was not possible to show any statistical significance related to tumour stage in terms of survival, local recurrence, regional metastases, or recurrence. In this study group, there was no association between tumour stage and regional nodal status.

The presence of regional neck node metastases at the time of presentation was an important indicator of prognosis. Eight patients (27 per cent) presented with clinically palpable neck nodes (N<sub>1</sub> or N<sub>2</sub>) and their five-year cause specific survival was significantly worse (38 per cent) compared to those with clinically uninvolved necks (100 per cent) as shown in Fig. 1 ( $p < 0.001$ ). Nodal status is also an important indicator of future regional recurrence ( $p < 0.01$ ) and possibly of local recurrence ( $p = 0.13$ ) (see Figs. 2 and 3). Five out of the eight patients with nodal

TABLE II  
T CLASSIFICATION (ACCORDING TO WANG, 1976)

	N <sub>0</sub>	N <sub>1</sub>	N <sub>2</sub>	Total
T <sub>1</sub>	4	1	0	5
T <sub>2</sub>	16	3	3	22
T <sub>3</sub>	2	0	1	3
Total	22	4	4	30

TABLE III  
TUMOUR AND NODAL STATUS AT PRESENTATION

	Radiotherapy (salvage surgery)	Surgery	Combined radiotherapy and surgery	Total
T <sub>1</sub>	5 (1)	0	0	5
T <sub>2</sub>	15 (9)	6	1	22
T <sub>3</sub>	0	1	2	3
Total	20	7	3	30

metastases at presentation developed a local or regional recurrence.

Histological grading into well, moderately, and poorly differentiated squamous cell carcinomas showed an increasingly poorer prognosis for the more poorly differentiated carcinomas, although this did not reach statistical significance ( $p = 0.11$ ).

Local recurrence in general did not effect survival as all six cases which developed local recurrence only, were successfully salvaged with surgery. Regional recurrence however, is a sign of poor prognosis with three (75 per cent) out of four patients with regional recurrence dying within 12 months of their recurrence. Late nodal metastases occurred in only one (5 per cent) out of 22 patients presenting with uninvolved neck nodes, and he was successfully treated with a radical neck dissection.

**Discussion**

Most reports agree that both surgery and radiotherapy offer equally good results in the treatment of early nasal vestibular carcinoma (Goepfert *et al.*, 1974; Wong *et al.*, 1986). Wong *et al.* reported local control rates of 80 per cent at five years in all patients treated with primary radiotherapy. In patients with a T<sub>1</sub> tumour, they reported a local control rate of 90 per cent. De Jong *et al.* (1981) reported a local recurrence in six (46 per cent) out of 13 patients primarily treated with radiotherapy.

In our series 10 (50 per cent) out of 20 patients (T<sub>1</sub> and T<sub>2</sub>) treated with primary radiotherapy had a local residual disease or a local recurrence, and eight of these 10 were successfully treated with salvage surgery. Thus the majority of the local recurrences after radiotherapy can be successfully salvaged with surgery, and the overall control rate (18 out of 20 in our series) approaches 90 per cent in most reports. Similar control rates are reported for treatment with primary surgery (Yarrington *et al.*, 1969; Goepfert *et al.*, 1974). Only one (T<sub>3</sub>N<sub>2</sub>) of the seven patients treated with primary surgery in our series developed a

local recurrence two and a half years after initial treatment.

Thus it would appear that small lesions can be successfully treated by either modality with good results in terms of local tumour control. Primary radiotherapy gives excellent cosmetic results. Surgical resection using an external rhinoplasty approach and reconstruction with contralateral lower lateral cartilage gives a cosmetically acceptable result (Boulos, 1984). Larger lesions require partial amputation of the nose with reconstruction using skin grafts, composite cartilage grafts, forehead flaps, and naso-labial flaps (Des Prez *et al.*, 1967; Vistnes *et al.*, 1968; Baker *et al.*, 1983). In most cases, however, it is difficult to reproduce the local contours satisfactorily and the above procedures are used to repair and replace the resected soft tissues and allow the fitting of a prosthesis. The final cosmetic result would therefore enhance radiotherapy as the primary treatment of choice for smaller lesions.

For more extensive lesions and where there is bone involvement, radiotherapy alone offers poor control. Wang (1976) reported six patients with a T<sub>3</sub> lesion treated with primary radiotherapy. Three of these recurred and none survived following salvage surgery. Weinberger *et al.* (1988) also report that involvement of the pre-maxilla is a relatively poor prognostic sign for primary treatment by radiation alone. They report that only one out four patients, where the cancer had invaded bone, was controlled by radiotherapy. In our series, all three patients with a T<sub>3</sub> lesion had bone involvement. They required surgery in the form of partial maxillectomy, with post-operative radiotherapy in two patients. All patients are recurrence free (follow-up six months to eight years) with a median follow-up of 67 months. This would indicate that primary radical surgery followed by radiotherapy, when indicated, is the treatment of choice in these patients.

The presence of regional lymph node metastases at the time of presentation is generally regarded as a sign of poor prognosis (Yarrington *et al.*, 1969; Wang, 1976; Schaefer *et al.*, 1980; Kagan *et al.*, 1969; Wong *et al.*, 1986; Wein-

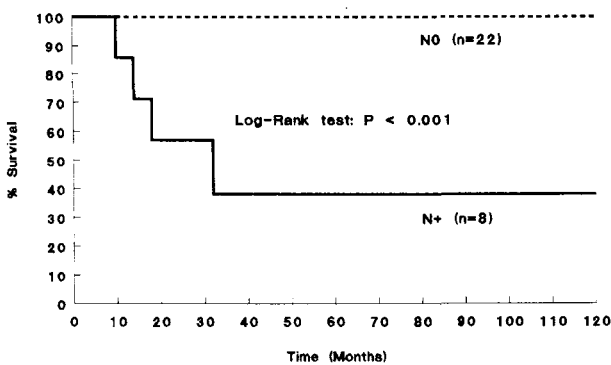


FIG. 1  
Cause specific survival of N<sub>0</sub> vs. N+

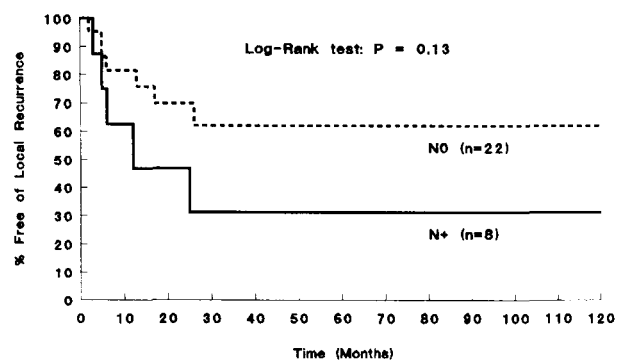


FIG. 2  
Patients free of local recurrence : N<sub>0</sub> vs N+.

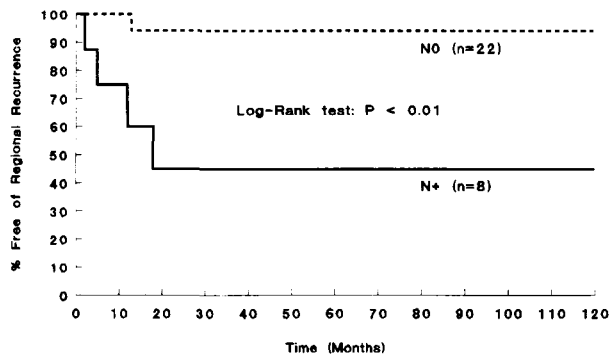


FIG. 3

Patients free of regional nodal recurrence:  $N_0$  vs.  $N_+$ .

berger *et al.*, 1988). In a review of the literature, only three of 16 collectively reported cases were free of disease after treatment (Wong *et al.*, 1988). Nodal status was the most significant indicator in our series, both for loco-regional recurrence, and for survival (Figs. 1, 2 & 3). The submandibular node was the most commonly involved node, being present in six out of the eight patients who presented with lymph node metastases. Three patients had bilateral nodes and one had multiple node involvement. Four out of the eight patients with lymph node metastases have died of the disease. The optimal treatment for such cases is radical loco-regional surgery with post-operative radiotherapy.

The question of elective treatment of the regional nodes needs to be addressed, and remains unanswered. There may be a role for elective treatment of regional lymph nodes in selected groups of patients. Million *et al.* (1984) suggest elective neck irradiation in patients with late, recurrent or poorly differentiated tumours. De Jong *et al.* (1981) report a late cervical metastases rate of five (23 per cent) out of 22 patients, with control of disease being achieved in only one out of five patients. He suggests an elective ipsilateral suprahyoid neck dissection, with radiotherapy (5000 cGy in five weeks) if metastases are shown to be present on histological examination. In 13 patients treated with elective neck irradiation (4000 cGy in three to four weeks) Baris *et al.* (1985) reported no late regional recurrence.

In our series, only one (5 per cent) out of 22 patients with a clinically uninvolved neck ( $N_0$ ) at presentation, developed a late nodal metastasis. He was successfully treated with a radical neck dissection. This compares well with a reported rate of 11 patients (5 per cent) developing late nodal metastases out of 202 collected patients from various series (Wong *et al.*, 1988). Nine out of these 11 were cured and regional nodal metastases were controlled in 10 out of 11 patients with subsequent neck dissection or irradiation. It is therefore apparent that no more than one per cent of the patients with a clinically uninvolved neck would benefit from elective treatment. We do not therefore recommend elective treatment of the clinically uninvolved regional lymph nodes.

## Conclusion

Squamous cell carcinoma of the nasal vestibule is relatively uncommon. Despite its close anatomical relationship to the nasal fossa and the facial skin, it has a different natural history and clinical behaviour, and it presents par-

ticular problems to both surgeons and radiotherapists in its management. For small early lesions, both surgery and radiotherapy offer good local control of disease. For  $T_1$  lesions we believe that radiotherapy remains the treatment of choice, in view of the superior cosmetic result.

The morbidity of treatment with radiotherapy has to be borne in mind, and includes discolouration of the face, irradiation of adjacent normal tissues, mucositis and the loss of a treatment modality for possible use in the future. However, in early  $T_1$  lesions the good results outweigh these disadvantages. The larger  $T_2$  lesions are perhaps better suited for treatment with surgery, as reflected in the significant rate (50 per cent) of local recurrences after radiotherapy in our series. The majority of these recurrences (eight out of ten) had to be salvaged by surgery and thus could have been spared the initial radiotherapy treatment. For  $T_3$  lesions, the treatment of choice is surgery followed by post-operative radiotherapy where indicated. When a patient presents with nodal metastases, irrespective of the stage of the primary tumour, surgical excision of the primary, with radical neck dissection is recommended. Elective treatment for uninvolved regional nodes is not considered necessary.

## Acknowledgements

This work was supported by research fellowship grants from the Midland Institute of Otolaryngology, the Rotha Abrahams Fund and the Ethicon Foundation.

## References

- Baker, S., Swanson, N. A. (1983) Management of nasal cutaneous malignant neoplasms. *Archives of Otolaryngology*, **109**: 473–479.
- Baris, G., Visser, A. G., Van An del, J. G. (1985) The treatment of squamous cell carcinoma of the nasal vestibule with interstitial iridium implantation. *Radiotherapy and Oncology*, **4**: 121–125.
- Boulos, E. J. (1984) External rhinoplasty approach for lesions of the nasal vestibule. *Laryngoscope*, **94**: 703–704.
- De Jong, J. M. A., Schalekamp, W., Hordijk, G. J. (1981) Squamous carcinoma of the nasal vestibule. *Clinical Otolaryngology*, **6**: 205–208.
- Des Prez, J. D., Keihn, C. L. (1967) Carcinoma of the nasal vestibule. *American Journal of Surgery*, **114**: 587–591.
- Deutsch, H. J. (1966) Carcinoma of the nasal septum. *Annals of Otolaryngology and Rhinology*, **75**: 1049–1057.
- Goepfert, H., Guillaumondegui, M. D., Jesse, R. H., Lindberg, M. D. (1974) Squamous cell carcinoma of the nasal vestibule. *Archives of Otolaryngology*, **100**: 8–10.
- Haynes, W. D., Tapley, N. V. (1974) Radiation treatment of carcinoma of the nasal vestibule. *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine*, **120**: 595–602.
- Kagan, A. R., Nussbaum, H., Rao, A., Chan, P., Gilbert, H., Hintz, B., Ryoo, M., Miles, J., Rice, D. (1981) The management of carcinoma of the nasal vestibule. *Head and Neck Surgery*, **4**: 125–128.
- Mendenhall, N. P., Parsons, J. T., Cassisi, N. J., Million, R. R. (1984) Carcinoma of the nasal vestibule. *International Journal of Radiation Oncology, Biology, Physics*, **10**: 627–637.
- Million, R. R., Cassisi, N. J., Hamlin, D. J. (1984) Nasal vestibule, nasal cavity and paranasal sinuses. In: *Management of Head and Neck Cancer*. (Million, R. R., Cassisi, N. J., eds.) B. Lippincott Company: Philadelphia.
- Schaefer, S. D., Hill, G. C. (1980) Epidermoid carcinoma of the nasal vestibule: current treatment evaluation. *Laryngoscope*, **90**: 1631–1635.
- Shiffman, N. J. (1979) Anterior intranasal carcinoma. *Canadian Journal of Surgery*, **22**: 159–160.
- UICC (1987) *TNM classification of malignant tumours*. Fourth edition (Hermanek, P., Sobin, L. H., eds.) Springer-Verlag, New York, Berlin, Heidelberg, London, Paris, Tokyo, p. 14.

- Vistnes, L. M., O'Connor, G. B., McGregor, M. W. (1968) Bilateral nasolabial flaps in nasal vestibular reconstruction: report of a case. *Archives of Otolaryngology*, **88**: 98–100.
- Wang, C. C. (1976) Treatment of carcinoma of the nasal vestibule by irradiation. *Cancer*, **38**: 100–106.
- Weinberger, J. M., Briant, M. D., Cummings, M. B., Wong, C. S. (1988) The role of surgery in the treatment of squamous cell carcinoma of the nasal vestibule. *Journal of Otolaryngology*, **17**: 372–375.
- Wong, C. S., Cummings, B. J., Elhakim, T., Briant, T. D. (1986) External irradiation for squamous cell carcinoma of the nasal vestibule. *International Journal of Radiation, Oncology, Biology, Physics*, **12**: 1943–1946.
- Wong, C. S., Cummings, B. J. (1988) The place of radiation therapy

P. PATEL, R. TIWARI, A. B. M. F. KARIM, J. J. P. NAUTA, G. B. SNOW

- in the treatment of squamous cell carcinoma of the nasal vestibule. *Acta Oncologica*, **27**: 203–208.
- Yarington, C. T., Jaquiss, G. W., Sprinkle, P. M. (1969) Carcinoma of the nose and nasal septum: treatment and reconstruction. *Transactions of the American Academy of Ophthalmology and Otolaryngology*, **73**: 1178–1183.

Address for correspondence:

Mr. P. J. Patel,  
Department of Otolaryngology, Head and Neck Surgery,  
Free University Hospital,  
De Boelelaan 1117,  
1081 HV Amsterdam,  
The Netherlands.  
Fax: (0) 20548 6688.

**Key words:** Nose neoplasms, nasal vestibule; Carcinoma, squamous cell.