Sino-nasal epithelial tumours: A pathological study of 69 cases

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ABSTRACT

Background: Epithelial neoplasms are uncommon lesions affecting the sino-nasal tract. There are hardly any reports in the Indian literature.

Aim: To study the incidence, mode of presentation and histological types of sino-nasal epithelial tumours in the surgical pathology material.

Setting and Design: Retrospective retrieval of all sino-nasal tumours and analysis of epithelial tumours.

Materials and Methods: All sino-nasal epithelial tumours, biopsied or surgically excised over a period of ten years, were studied. The tumours were classified as benign or malignant. The histology was correlated with the clinical presentation and investigations.

Results: In ten years, there were 120 sino-nasal tumours representing 0.14% of all the surgical specimens received. Sixty-nine epithelial tumours (59.2%) outnumbered the non-epithelial tumours and were diagnosed on the basis of histopathology. Twenty were benign and 49 malignant; occurring predominantly in males. Benign lesions included four squamous papillomas and 16 inverted papillomas, with recurrence in three inverted papillomas (21%). Squamous cell carcinomas were the commonest among malignant tumours and four of these were associated with inverted or cylindrical cell papilloma. The second most frequent malignant tumour was adenoid cystic carcinoma with eight cases. Other rare types included the variants of squamous carcinoma, adenocarcinomas of the non-enteric type, muco-epidermoid carcinoma and undifferentiated carcinomas.

Conclusion: Sino-nasal epithelial tumours are rare lesions, with male preponderance. Inverted papillomas and squamous cell carcinomas are the most frequent neoplasms.

KEY WORDS: Nasal cavity, Para-nasal sinuses, Tumours, Papillomas, Carcinomas

Materials and Methods

This is a retrospective study conducted at a large teaching hospital. The blocks and slides of all sino-nasal epithelial tumours, biopsied or surgically excised over a period of ten years (1993-2002), were retrieved and reviewed. All slides were stained by the routine haematoxylin and eosin stains. The tumours were classified as benign or malignant. Squamous papillomas of the vestibule, olfactory neuroblastomas, melanomas and teratoid carcinomas were excluded from this study. The histology was correlated with the clinical presentation and investigations, obtained from indoor registration papers, filed in the medical records department of the hospital.

Results

In ten years, among 87,878 specimens received at the general surgical pathology laboratory, 120 were sino-nasal tumours. Sixty-nine were epithelial in nature, 20 benign and 49 malignant. It was noted that most patients with benign tumours (median age 40.5 years), were in the fourth and fifth decades while malignant lesions occurred in patients over the fifth decade (median age 55 years). In general, nasal obstruction, epistaxis and headache were symptoms common to both groups, but facial swelling, features of orbital and/or intracranial extension and lymphadenopathy were seen exclusively in the malignant variety, especially as evidenced by radiography or CT scans (Table 1).

The benign tumours, the papillomas, were received in the form of multiple polypoidal, firm and white bits with undulant or papillary surfaces (Figure 1). Of the 20 cases, 19 involved the nasal cavity while one was seen to affect solely the sphenoidal sinus. Seven nasal masses were also seen extending into the ipsilateral antral (4) and ethmoidal (3) sinuses. Two cases were bilateral. Sixteen papillomas were of the inverted type, characterized by infolding of the metaplastic stratified squamous
epithelium with focal areas of ciliated columnar cells. Numerous micro-cysts containing nuclear debris and mucin were present, giving the epithelium a 'moth-eaten' appearance (Figure 1). Stroma was either oedematous or fibro-collagenous, with chronic inflammatory cells in some. Three inverted papillomas recurred four to eight months after the initial surgery. There was no histological alteration. Four were fungiform or squamous papillomas. They were exophytic with proliferating squamous epithelium growing outwards (Figure 2).

There were four papillomas associated with squamous cell carcinoma (Table 2). The first case was a 21-year-old male with multiple excisions for inverted papillomas in the past. The present admission revealed a left nasal mass, extending into the ipsilateral maxillary and sphenoidal sinuses. Microscopically, the tumour showed a spectrum of changes in the lining with usual squamous epithelium, dysplasia and invasive carcinoma (Figure 3). The remaining three cases showed a synchronous papilloma and carcinoma. Two were again inverted papillomas while the third was a cylindrical cell papilloma or oncocytic scheinorian papilloma. The latter revealed stratified ciliated columnar epithelial cells with eosinophilic, granular cytoplasm and round vesicular nuclei (Figure 2). There were foci of squamous metaplasia, dysplasia and invasive carcinoma.

There were 45 sino-nasal carcinomas (Table 2). Specimens were received in the form of biopsies (26), partial maxillectomy (1) and total maxillectomies (14) and total maxillectomies with orbital extenereation (4) (Figure 4). The tumours were on the left side in 24 patients, on the right side in 18 and bilateral in three. They were also multi-centric, with involvement of more than one site at initial presentation. Well or moderately differentiated squamous cell carcinoma (Figure 4) was diagnosed in 19 while five lesions showed a poorly differentiated sub-

Table 1: Sino-nasal epithelial tumours presenting features

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Benign (n = 20)</th>
<th>Malignant (n = 49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal obstruction</td>
<td>19</td>
<td>30</td>
</tr>
<tr>
<td>Epistaxis</td>
<td>06</td>
<td>20</td>
</tr>
<tr>
<td>Headache</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>Facial swelling</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Orbital extension</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Intracranial extension</td>
<td>-</td>
<td>03</td>
</tr>
<tr>
<td>Cervical lymphadenopathy</td>
<td>-</td>
<td>01</td>
</tr>
</tbody>
</table>

Table 2: Sino-nasal carcinomas (n=49)

<table>
<thead>
<tr>
<th>Type</th>
<th>Males</th>
<th>Females</th>
<th>Age range in years</th>
<th>Mode of diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papilloma with squamous cell carcinoma</td>
<td>04</td>
<td>-</td>
<td>21 to 60</td>
<td>Biopsy</td>
</tr>
<tr>
<td>Squamous cell carcinoma</td>
<td>20</td>
<td>04</td>
<td>35 to 72</td>
<td>Biopsy</td>
</tr>
<tr>
<td>Sarcomatoid squamous cell carcinoma</td>
<td>01</td>
<td>-</td>
<td>50</td>
<td>Biopsy</td>
</tr>
<tr>
<td>Transitional cell carcinoma</td>
<td>-</td>
<td>03</td>
<td>55 to 67</td>
<td>Total maxillectomy</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>02</td>
<td>01</td>
<td>44 to 53</td>
<td>Total maxillectomy</td>
</tr>
<tr>
<td>Adenoid cystic carcinoma</td>
<td>05</td>
<td>03</td>
<td>35 to 62</td>
<td>Total maxillectomy</td>
</tr>
<tr>
<td>Mucoepidermoid carcinoma</td>
<td>01</td>
<td>-</td>
<td>50</td>
<td>Total maxillectomy</td>
</tr>
<tr>
<td>Undifferentiated carcinoma</td>
<td>04</td>
<td>01</td>
<td>29-68</td>
<td>Total maxillectomy</td>
</tr>
</tbody>
</table>
type. Sarcomatoid squamous carcinoma was seen in a 50-year-old male. The tumour was reported as a squamous cell carcinoma on biopsy. Subsequent maxillectomy revealed additional fascicular spindle cell component with pleomorphism and mitoses (Figure 5). There were three transitional cell carcinomas seen bilaterally in three elderly females. Ribbons of malignant cells resting on the intact basement membrane were seen (Figure 5). Among the 12 adenocarcinomas, the salivary gland types were the commonest; adenoid cystic in eight and muco-epidermoid in one (Figure 6). All the adenoid cystic carcinomas showed a characteristic cribriform pattern. Perineural invasion were seen in four. The patient with muco-epidermoid carcinoma presented with nasal obstruction and facial swelling. The tumour was seen to arise from the surface epithelium and was composed of islands with squamous and mucin-secreting cells. The usual non-enteric type was seen in only three (Figure 7). Sino-nasal undifferentiated carcinoma was seen in five. In addition to the usual symptoms of malignancy, one of the patients with a sphenoidal tumour presented with unilateral palsies of cranial nerves VII, X, XI and XII, and cervical lymphadenopathy. These tumours were composed of pleomorphic cells in sheets and lobules with focal necroses (Figure 7). The cells possessed scanty cytoplasm, bizarre hy-
perichromat or vesicular nuclei and prominent nucleoli.

**Discussion**

Sino-nasal tumours represented only 0.14% of the surgical pathology material received by our laboratory. As noted previously, the epithelial tumours outnumbered non-epithelial tumours (ratio 1.44:1). There were 24 papillomas (34.8%). Though the ages ranged from 25 to 60 years, 60% occurred in the fourth and fifth decades of life and predominantly in males, as has been previously observed. Among the three types i.e. fungiform or exophytic, inverted or endophytic and cylindrical or oncocytic Schneiderian, the commonest variant was the inverted sub-type (an incidence of 70.76%) while the cylindrical was the rarest. Inverted papillomas also formed a common sub-group in our study with an incidence of 80%.

Many studies have been devoted to inverted papillomas. This is because these tumours are often multi-centric, with a marked tendency for aggressive behaviour, recurrence after surgical excision (5-20%), and transformation to an epithelial malignancy (5-9%), most commonly squamous cell carcinoma. Therefore, it would be of utmost importance to make an accurate pre-operative diagnosis which would permit optimal management of patients. Cylindrical cell papillomas can also undergo malignant transformation and till 2001 only 16 such cases have been reported.

The coexistence of epidermoid carcinoma in both fungiform and inverted papillomas is explained by the presence of the human papilloma virus infection. Other malignant sub-types rarely coexist with the papillomas. Among the 19 inverted papillomas that we encountered, four (21%) recurred while three (15%) developed invasive squamous cell carcinoma either synchronously or metachronously. There was only one case of cylindrical cell papilloma but even that showed a synchronous malignancy. We therefore feel that a thorough sampling of the entire material received in the laboratory is the golden rule to reach the final diagnosis. This may apply also to specimens excised as inflammatory polyps in which might lurk papillomas. Besides, one may also rely on the estimation of serum squamous cell carcinoma antigen which serves as a useful biologic marker in patients with papillomas.

Sino-nasal carcinomas are also uncommon neoplasms. Amongst the malignant epithelial tumours in this series, 'de novo' squamous cell carcinomas were the commonest, constituting 55%. Tobacco and air pollution have been implicated in the pathogenesis of these lesions. Among our 24 patients, only seven were chronic smokers and all were males. An unusual case in this series was squamous cell carcinoma arising from the wall of an antral cyst, as has been reported previously. We also encountered two rare variants of the mundane squamous cell carcinomas, sarcomatoid and transitional types. Sarcomatoid squamous cell carcinoma was seen in a 50-year-old male with right-sided nasal mass. Transitional cell carcinomas have an incidence of 2% to 11% and have a better prognosis. We had three transitional carcinomas (6%), all in elderly women, and it was bilateral in one of them. Such lesions have been considered to be variants of non-keratinising squamous carcinomas and hence, they can be associated with foci of invasive carcinoma, seen in one of our cases.

Adenocarcinomas of the sino-nasal tract can be broadly classified into the non-salivary and salivary types. The non-salivary adenocarcinomas represent about 10% to 20% of the sino-nasal malignancies. One set of such adenocarcinomas arises from the lining epithelium or from the sero-mucous glands, termed as the non-enteric type, while the other set, 'enteric' type is usually secondary to epithelial metaplasia in response to wood dust or other occupational hazards. There were only three adenocarcinomas which we came across, an incidence of 6.5%. All were of the non-enteric type. The salivary gland-type of neoplasms are said to arise from the surface epithelium. Adenoid cystic carcinoma was seen in eight of our patients (17.8%). In general, these are more frequent than the usual adenocarcinomas and are aggressive tumours, but with a better outcome as compared to similar tumours arising elsewhere in the head and neck region. Muco-epidermoid carcinomas are also extremely rare, with only one case in our series.

There were five cases of undifferentiated sino-nasal carcinoma which is an example of a high-grade tumour and one of the cases showed both intracrinal extension and lymph node metastasis. They need to be distinguished from other poorly differentiated sino-nasal tumours, since they require aggressive therapy that includes a combination of craniofacial resection, chemotherapy and radiotherapy.

Most of our patients come to the hospital in the advanced stage with involvement of nasal and para-nasal sinuses and hence accurate determination of the site of origin is difficult. Besides, in the early stages of the disease, the signs and symptoms of the neoplastic processes are essentially similar to inflammatory pathology of the sino-nasal tract with resultant delay of diagnosis. Lack of adequate follow-up is the bane of most of the Indian studies, as is in this study too. The patients are referred from various centres across the country and then referred to cancer centres for further treatment after either biopsy or resection.

**References**


**References**


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**A pathological study of sinonasal epithelial tumours**

Panchal et al have succinctly presented the epidemiology of sinonasal tumours from the pathology departmental perspective occurring in the Indian catchment area over a 10-year period. As the data were gathered primarily from pathological specimens, both specimens biopsy and excised, the data are skewed both in terms of epidemiology and clinical reporting. Nonetheless, the epidemiological information presented regarding the ratio of benign to malignant lesions as well as the histopathology of the malignant lesions is helpful from a reference standpoint. As with many such pathology-based studies, determining the true clinical presentation and outcomes with surgical and non-surgical treatment regimens, is lacking.

However, the data presented remind us of several serious elements concerning sinonasal cancer. First of all, clinicians must always remember that the finding of a papillomatous lesion on biopsy should be followed by complete excision since, as the authors point out, examination of the entire papillomas specimen may be required to identify the 15-30% of inverting papillomas that contain squamous cell carcinoma. In addition, some areas of the papillomas may be fungiform whereas other areas may be in fact inverting. In addition, almost all sinonasal malignancies present in a very insidious manner. Determining the true site of origin is often difficult. With the extreme proximity of adjoining vital structures such as the orbit, skull base and facial bones even a small amount of “local” spread may subsequently require an extensive and potentially deformative surgical ablative procedure. Unfortunately, little progress has been made in the screening and early diagnosis of sinonasal malignancies. However, in developed nations, the widespread availability of three-dimensional imaging (computed tomography and magnetic resonance imaging) has allowed for the somewhat earlier identification of symptomatic and occasionally asymptomatic lesions and additionally more accurate determination of the site of origin and stage. We have recently published several papers on the staging and clinical outcomes for a wide variety of sinonasal malignancies. A wide variety of histopathologies may be encountered in sinonasal neoplasia and significantly different survivals may be encountered when matched for stage among these different pathologies.

As the authors’ data point out, sinonasal tumours and malignancies constitute only a very small fraction of solid tumours. As nations industrialize, with the burning of additional fossil fuels and rising air pollution rates, we are likely to see an increasing incidence of sinonasal tumours. Therefore, common nasal symptoms that present oddly should arouse suspicion for sinonasal neoplasia. For example, persistent unilateral epistaxis with pain should alert the clinician to the possibility of maxillary sinus cancer. In appropriate patients with risk factors such as smoking and wood dust exposure, there should be a low threshold for three-dimensional imaging and detailed nasal endoscopy. A higher index of suspicion is our only hope of diagnosing these tumours at an earlier stage, which will require a less morbid ablative procedure and will likely result in better survival and quality of life outcomes.