

## PAPILLOMAS OF THE NOSE AND PARANASAL SINUSES: A CLINICO-PATHOLOGIC STUDY

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### SYNOPSIS

Papillomas of nose and paranasal sinuses are uncommon tumours. Based on the detailed clinical and histopathological examination of seven cases of papillomas, the authors would accept and recommend the suggested unifying name of transitional cell papilloma for these lesions which may further be subdivided into Type I and Type II. The rationale behind this classification is discussed at length. There is a greater tendency for Type II papillomas to recur and undergo malignant change. It is suggested that Type I papillomas be managed by relatively simple surgical procedures whereas Type II cases be dealt with more radically.

### INTRODUCTION

Dickerman (1896) was the first person to publish a case report of nasal papilloma in American literature, although Ward (1854) and Billroth (1855) had come across a few cases, one of which recurred repeatedly after surgical removal. Hopmann and Billroth (1883) classified polyps of the nose into hard and soft papillomas, the former was thought to be a true neoplasm and the latter resulted from chronic inflammation. Wright (1897) drew attention to the frequent recurrence of this lesion after surgical removal. Since then several reports of this uncommon condition have appeared in the literature, yet the controversy regarding its nomenclature, aetiology, clinical course and histological appearances has remained far from being resolved.

Papillomas of the nose and paranasal sinuses have been given no less than 20 names, common among them being inverted papilloma, transitional cell papilloma, cylindrical cell papilloma, Schneiderian papilloma, Ewing's papilloma and papillary sinusitis. Although the majority of workers believe these papillary lesions to be true neoplasms, a few (Kramer and Som, 1935; Eggston and Wolff, 1947) regard them as inflammatory in origin. With regard to the clinical course, the risk of malignant transformation of these lesions has been stressed by Brown (1964), Mabery *et al* (1965), Skolnik *et al* (1966) and others. It has been

suggested that all papillomas of nose and paranasal sinuses be regarded as 'pre-malignant' from their onset although Hyams (1971) disapproves of this assumption as being unwarranted and should be discouraged to prevent over treatment.

Histogenesis of these papillomas of nose and sinuses is not yet fully understood. Ringertz (1938) and Osborn (1956) along with others have described the microscopic picture of these lesions. The multicentric origin of these tumours and the characteristic inversion of the surface epithelium in the majority of these papillomas has been well noted. Attention has been drawn to the tendency of the basement membrane to remain intact despite the deep invaginations that these tumours may have. Hyams (1971) categorized papillomas into (a) inverted (b) fungiform and (c) cylindrical cell types. Osborn (1956) however called all these lesions transitional cell growths in view of the predominant transitional cell pattern in the large majority of these papillomas.

In the present study an attempt has been made to justify the name of Transitional cell Papilloma for these lesions which we think are true benign neoplasms, to suggest a simplified classification and to correlate the clinical course with their histological appearances. The information thus gathered may be of help in planning treatment.

### MATERIAL AND METHODS

Seven cases of transitional cell papillomas of nose and paranasal sinuses were diagnosed in University Hospital, Kuala Lumpur since October 1969. The clinical manifestations, radiological appearances and the surgical management and subsequent follow up were documented. A histopathological study of all the biopsy material was undertaken. Each biopsy was formalin-fixed immediately after removal. They were sectioned and

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examined by using the following staining methods: Haematoxylin and Eosin; Verhoeff's elastic Van Gieson, Gordon and Sweet's Reticulin and Kreyberg's (1967) modification of Masson's Alcian Green (to demonstrate mucin and keratin).

## OBSERVATIONS

### Clinical Features

All the patients under study were above 40 years of age with two out of seven being in the fifth decade (Table I). The male female sex ratio was 5:2. Five were Chinese, one Malay and one Indian. All were of low socio-economic status.

Nasal obstruction was the most important and invariable complaint of all patients in this group. It was unilateral in five cases and bilateral in the remaining two. Five of these patients had a mucoid nasal and/or postnasal discharge. In two others the discharge was occasionally blood stained. The duration of the symptoms varied from one to ten

years. Clinical examination revealed a characteristic fleshy granulomatous and polypoidal growth located principally in one nasal cavity in all cases. However in two cases the lesion extended into the nasopharynx and encroached upon the choana on the opposite side. All appeared to arise from the lateral nasal wall in the region of the middle meatus.

X-rays of the sinuses showed opacification of the ipsilateral maxillary sinus in all cases. In three patients there was erosion of the lateral nasal wall. Other walls of the maxillary sinus were normal.

### Histological Features and Classification

The salient histological features of the biopsy material are given in Table II. All the benign growths were called transitional cell papillomas and these were sub-divided into two types namely Type I and Type II. The rationale behind this nomenclature is explained below.

That the nose and paranasal sinuses are lined by pseudostratified columnar ciliated epithelium in the newborn and in the young child is generally accepted. This epithelium consists of at least two types of cells, the superficial ciliated columnar cells and the deeper supporting cells. Mucus secreting goblet cells are present in between the superficial columnar cells. As elsewhere in the respiratory tract metaplastic change may alter much of this epithelium into either the transitional type (as defined by Bryant in 1916) or the squamous type. Stratification is present in both these types of epithelia. So far as we know there is no information available on the distribution of metaplastic epithelium in the nasal cavity in the young adult. However, on the basis of studies made on the

TABLE I

#### AGE, SEX AND ETHNIC GROUP DISTRIBUTION OF CASES STUDIED

Case Nos.	Age	Sex	Ethnic Group
1	44	F	Chinese
2	46	M	Malay
3	50	M	Indian
4	57	M	Chinese
5	41	M	Chinese
6	40	F	Chinese
7	47	M	Chinese

TABLE II

#### MAIN HISTOLOGICAL FEATURES

Case Nos.	Approximate Epithelial Cell Thickness in Microns	Degree of Inversion	Basement Membrane	Degree of Epithelial Dysplasia	Carcinoma-in-situ	Surface Columnar Epithelium	Histological Type of Papilloma
1	120 to 200	Moderate to marked	Intact	Mild	Absent	Largely intact	Type I
2	120 to 200	Moderate	Intact	Mild	Absent	Intact	Type I
3	120 to 200	Moderate	Intact	Mild	Absent	Largely intact	Type I
4	200 to 300 Thinner in carcinoma-tous areas	Mild. Infiltration in carcinoma-tous areas	Intact in papillomatous areas. Penetrated in carcinoma-tous areas	Moderate to severe	Present in the border-zone	Largely lost	Type II & carcinoma
5	200 to 300	Mild	Intact	Moderate	Absent	Largely lost	Type II
6	200 to 300	Mild	Intact	Moderately severe	Present	Lost in places	Type II & carcinoma-in-situ
7	120 to 300	Mild to moderate	Intact	Moderate	Absent	Largely lost	Type I & Type II

nasopharynx by Yeh (1962) and Ali (1965) it is assumed that a considerable area of the nasal mucosa in the young adult is either of the transitional type or of the stratified squamous type. We believe that the transitional cell papilloma of nose arises in an area of such metaplastic transitional epithelium. For this reason and because of the characteristic transitional cell pattern exhibited by the large majority of these lesions we would agree with Osborn in naming them all transitional cell papillomas.

The classification of these papillomas into Types I and II is based on the following criteria.

- (a) The predominant cell pattern namely whether the epithelial components have a transitional or squamous-like pattern.
- (b) Degree and depth of inversion of the epithelial columns.
- (c) The epithelial cell thickness; this refers to the thickness of the surface epithelium and the invaginating columns.

### 1. Transitional Cell Papilloma Type I

This includes the epithelial papilloma of Ewing (1927) and the so-called inverted papilloma. The covering epithelium of these papillomas shows a

variable increase in cell thickness but generally not more than 200 microns. The cell pattern is predominantly transitional in type. The epithelial columns often have a ribbon-like or garland-like pattern. There is moderate to severe degree of inversion of these columns into the subjacent stroma. Squamous metaplasia is frequently seen and this may involve small or large areas. Intra-epithelial dysplasia is commonly seen. In-situ carcinomatous change is uncommon. The surface columnar epithelium tends to remain intact over large areas.

### 2. Transitional Cell Papilloma Type II

In this type there is marked increase in thickness of the surface epithelium often to more than 200 microns. There is almost complete conversion of the epithelium to the squamous type. Inter-cellular cytoplasmic processes are present. However the flattening of the surface layer of cells as seen in stratified squamous epithelium is not seen. Keratinization is absent. Inversion into subjacent stroma is mild to moderate. Intra-epithelial dysplasia can be severe. Focal carcinoma-in-situ may be present. The surface columnar epithelium is largely lost but occasional goblet cells remain.

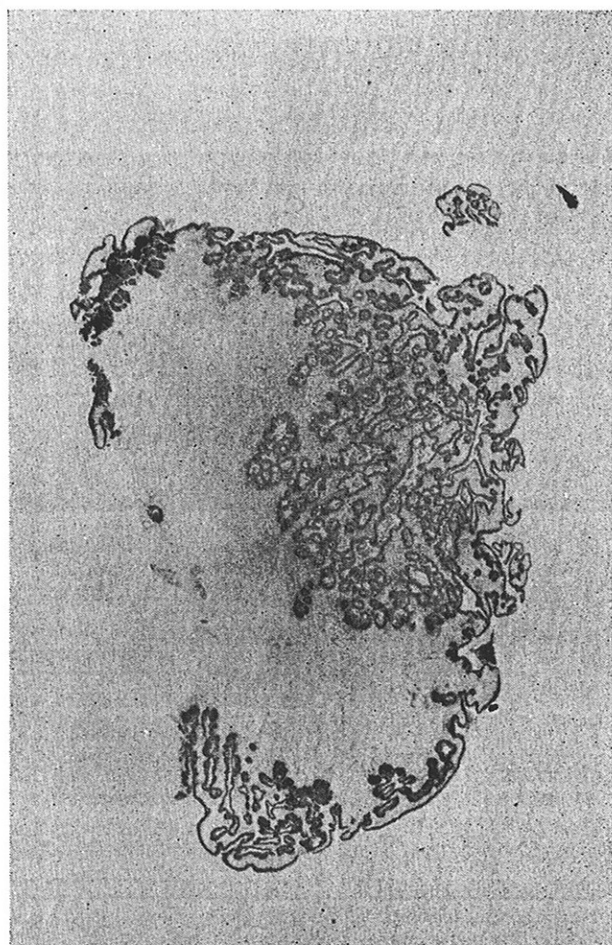


Fig. 1. Case 1. Transitional cell papilloma showing extensive invagination of the epithelial columns into the subjacent stroma. H & E  $\times 4$ .



Fig. 2. Case 1. Transitional cell papilloma Type I showing relative preservation of the surface ciliated columnar epithelium. H & E  $\times 31$ .



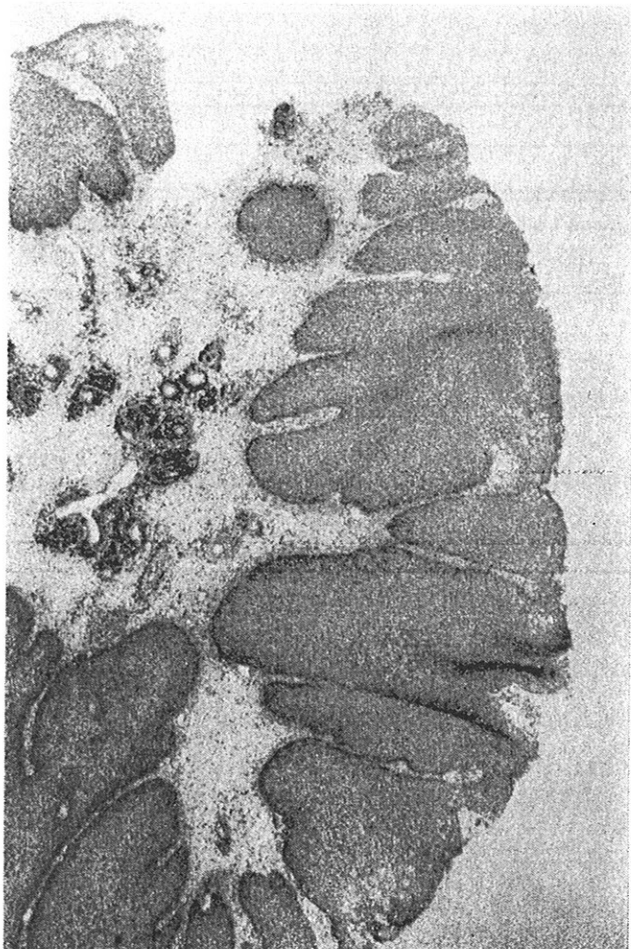


Fig. 3. Case 4. Transitional cell papilloma Type II showing predominant squamous cell pattern and increased epithelial thickness. H & E.  $\times 31$ .

## RESULTS

Of seven cases studied three were classified as Type I and another three as Type II papilloma (Table II). In Case No. 4, which was classified as Type II there was an associated malignant tumour which was histologically a poorly differentiated squamous cell carcinoma. In this particular case the transition of a papilloma to carcinoma-in-situ to a carcinoma was demonstrated (Figs. 3, 4 and 5). Case No. 6 was included in the Type II group and severe epithelial dysplasia and carcinoma-in-situ was present. Case No. 7 showed features of both types.

The treatment given to these seven patients was not based on the additional information which only became available at the end of the present study. Case No. 4 who had an associated inoperable carcinoma was sent for radiotherapy. Case Nos. 1, 2 and 3 had Caldwell-Luc operation on the side of the lesion and intranasal and/or transantral ethmoidectomy. Case No. 7 had extensive lesions and hence had a lateral rhinotomy with exenteration of tumour and ethmoidectomy. Case No. 5 had a Caldwell-Luc but no ethmoidec-

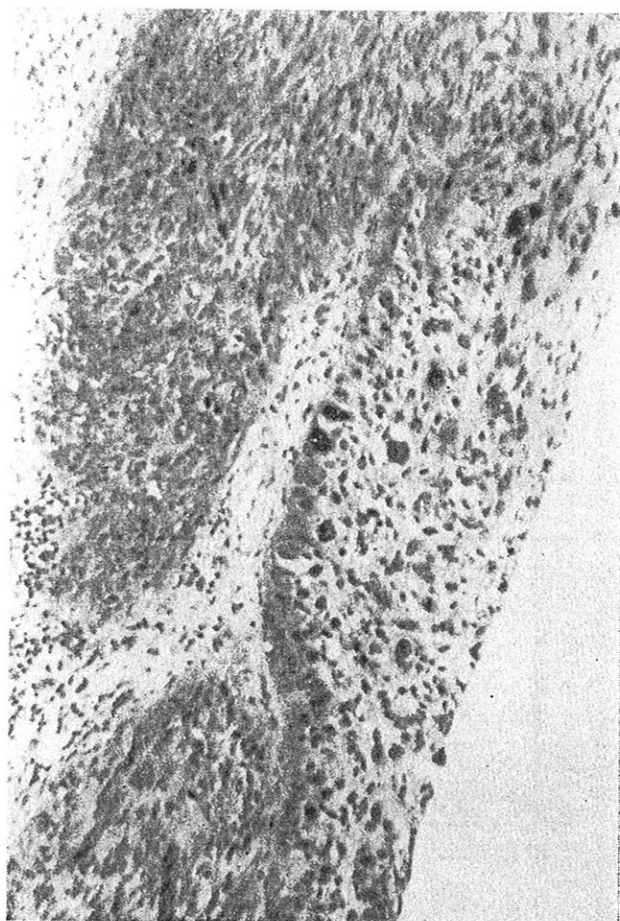


Fig. 4. Case 4. Transitional cell papilloma Type II showing carcinoma-in-situ changes. H & E  $\times 312$ .

tomy. This particular patient showed recurrence of growth within two and half months. All the other cases have so far shown no evidence of recurrence. Case No. 6 is a very recent one and is being further investigated before deciding on the line of treatment.

## DISCUSSION

Following on the detailed description of nasal papilloma by Osborn and others there has been increasing acceptance of the name transitional cell papilloma for these lesions. The nose and paranasal sinuses are normally lined by pseudostratified columnar ciliated epithelium in the newborn and in the young child. Like in the nasopharynx the mucosa in the nose may undergo metaplastic change to the transitional or the stratified squamous type. It is suggested that transitional cell papilloma arise from an area of metaplastic transitional epithelium and they are true benign neoplasms. We do not think that chronic inflammation of bacterial or allergic origin plays a significant part in the initiation of these lesions. In the seven patients studied in this series, none gave history of allergy or infection; the main complaint being nasal block without sneezing attacks or purulent

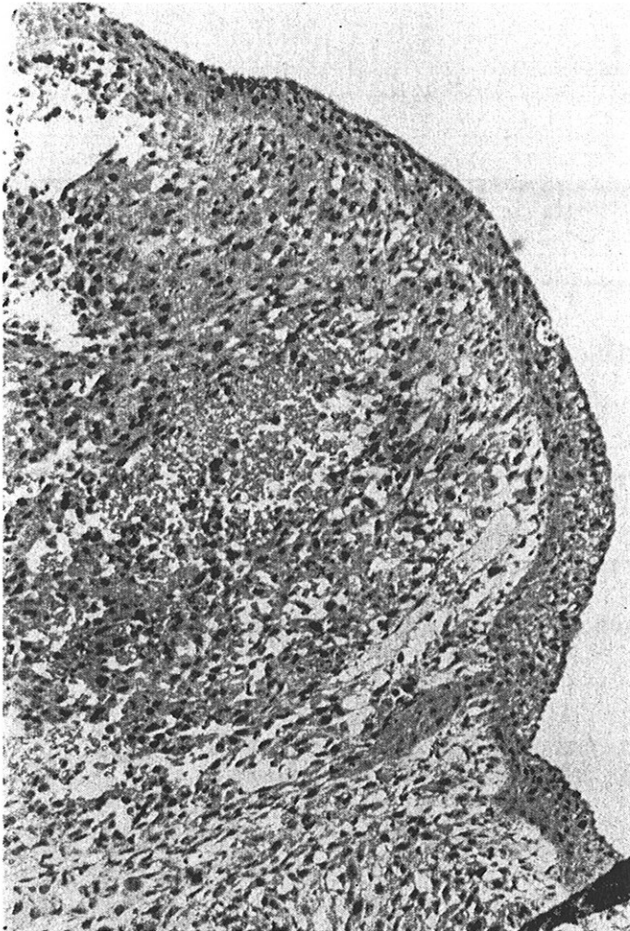


Fig. 5. Case 4. Poorly differentiated carcinoma infiltrating undersurface of epithelium. Found in association with a transitional cell papilloma Type II. (Refer Figs. 3 and 4). H & E  $\times 125$ .

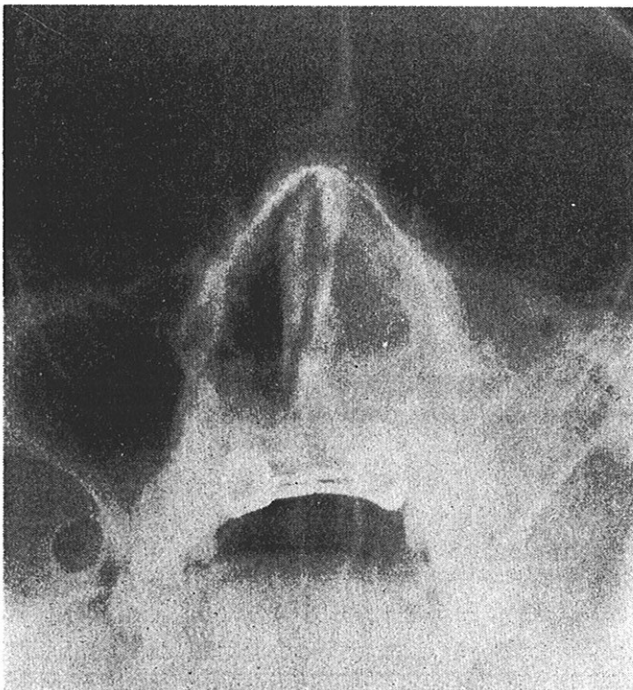


Fig. 6. Case 7. Paranasal sinus X-ray (occipitomeatal view) showing opacification of left maxillary sinus with erosion of the lateral nasal wall. Normal right maxillary sinus.

discharge. The possibility of viral aetiology has for the moment been disproved by Gaito *et al* (1965) who failed to observe any virus-like particles in electron-microscopic studies. The multicentric origin of these tumours was confirmed in our study and this further supports the neoplastic nature of this lesion.

It is not possible to distinguish the Type I and Type II papillomas by clinical examination alone. In three of the Type II cases there was radiological evidence of erosion of the lateral nasal walls. In two of them there was an associated carcinoma and this suggests their different behaviour from Type I papillomas. Though both types may recur if inadequately excised, the eventual malignant transformation appears to be more frequent in Type II lesions.

Surgical treatment of the papillomas of nose and sinuses have varied from nasal polypectomy to lateral rhinotomy and ethmoidectomy (Truckey, 1959; Cody, 1967; Skolnik *et al*, 1966). Hyams (1971) feels that unless there is an associated malignancy there appears no justification for a mutilating operation. Cummings and Goodman (1970) state "it seems appropriate to consider a more radical approach than polypectomy for the treatment of papillomas if their great propensity for recurrence is to be diminished". We feel that whereas Type I papillomas may be dealt with by polypectomy with intranasal ethmoidectomy, Type II lesions must have a more radical procedure like Caldwell-Luc operation with intranasal and/or transantral ethmoidectomy. In widespread lesions a lateral rhinotomy may also be required. We feel that ethmoidectomy is essential in view of the fact that most of these tumours arise from the region of middle turbinate which is a part of ethmoid.

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