

# IMMUNOHISTOCHEMICAL STUDY OF EPITHELIAL CELL MARKERS IN INVERTED PAPILLOMA OF THE NOSE AND PARA - NASAL SINUSES

*By*

Nagwa, M. Helal; Abdel - Hamid, A.;  
Tawfik A. and Ghonim, M. R.

*From*

The Pathology and E.N.T. Departments, Mansoura  
Faculty of Medicine

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## INTRODUCTION

Inverted papilloma is an unusual tumour of the nose accounting for less than 1% of nasal tumours (Snyder and Persin, 1972). Although it is essentially a benign lesion, it has a marked propensity for recurrence and can be locally destructive. Occasionally inverted papilloma is associated with malignancy, the exact nature and frequency of these relationship is unknown (Gayle and Woodson, 1985).

Our aim is to use epithelial surface markers to investigate the expression of keratin, epithelial membrane antigen (E.M.A.) and carcino-embryonic antigen (C.E.A.) in an attempt to help the correct diagnosis of premalignant

cases and consequently the management of such cases.

## MATERIAL AND METHODS

This study was done on nine patients. The surgical specimens were obtained from E N T. Department at Mansoura University Hospital. The specimens were fixed in 10 % formaline and then processed as paraffin blocks. Serial 4 um paraffin sections were made and stained with Haematoxylin and Eosin for routine study. The antibodies were kindly supplied by Dr. K. Geboes. Professor of Pathology Leuven University , Belgium. They include polyclonal antikeratin antibody and monoclonal antibodies against (E.M.A ) and (C E.A.). The

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immunohistochemical method performed using indirect peroxidase (Naeim et al., 1982) (Peroxidase anti-peroxidase PAP technique).

## RESULTS

Immuno-Histochemical results table (I) shows the following :

### 1) Antikeratin :

- The normal respiratory epithelium and the mucous secreting glands failed to take the stain,

- **The tumour** : Eight out of nine cases show cytoplasm with homogenous and diffuse staining with moderate intensity.

### 2) Anti C. E. A. :

- The normal respiratory epithelium stains negative, while the mucous secreting acini show faint positive staining.
- **The tumour** : Seven out of nine cases shows weak positive staining which is restricted to the suprabasal layers.

### 3) Anti E. M. A. :

- The normal respiratory epithelium shows weak positive staining in some cells however the glands failed to take the stain.

- **The tumour** : Five out of nine cases shows weak positive staining in the basal layer only. The inflammatory cells within the connective tissue stroma show no reactivity.

## DISCUSSION

Inverted papilloma of the nose and para-nasal sinuses is a rather uncommon condition characterized by hyperplasia of the basal cells and invagination of the epithelium in the underlying stroma (Van Olphen et al., 1988). It forms a diagnostic problem especially when the biopsy is small specimen. Because it has a high recurrence rate, and also malignant transformation can occur in 2 - 20 % of cases, it is important to make an effort to discover the premalignant cases (Kamal, 1981). In this study we use the polyclonal anti-keratin antibody to test for the intermediate filament prekeratin characteristically expressed by the epithelial

cells. The normal respiratory and glandular epithelium failed to take the stain with antikeratin antibody, while the neoplastic epithelium show moderate immunoreactivity with this antibody in 8 cases out of 9). This finding is consistent with the finding of Schlegel et al., (1980), and denote the expression of new cytokeratins in the neoplastic cells. This may be one of the predicting signs for further neoplastic transformation.

E. M. A. a large glycoprotein, has been demonstrated normally on secretory and other epithelial surfaces of most nonsquamous tissues in humans (Ormerod et al., 1983). In the present study immunoreactivity to E M A. is found in 5 cases that give weak positive stain. A previous work done by Graham et al., (1980) and Muraro et al. (1985) showed the presence of the EMA marker in the eccrine, apocrine and sebaceous glands.

C E.A. which was originally thought to be a gastro-intestinal specific marker has subsequently been demonstrated in a variety of non-gastro-

intestinal tumours (Krisch et al., 1985). It is considered as a family of isoantigens which have multiple antigenic determinants, some of these determinants may be common to all the isoantigens and others may be antigenically distinct. In the present study C.E.A. give a weak positive immunoreactivity in 7 cases, while the normal respiratory mucosa is negative.

However the antikeratin antibody is more decisive in predicting further neoplastic transformation because neither E,M,A. nor C E.A. are present in all cases and also they are react weakly, but using the three epithelial markers together and recording the staining as positive or negative irrespective of the intensity of the staining we can distinguish the normal inflammatory from neoplastic area especially in tiny biopsies.

## SUMMARY

The expression of keratin, carcinoembryonic antigen (C.E.A) and epithelial membrane antigen (E.M.A) were studied in the epithelial linings of 9 cases of inverted papilloma of the

nose and para-nasal sinuses , using an indirect immunoperoxidase method on formalin fixed paraffin embeded sections. 8 cases were positive with polyclonal antibodies of keratin specificity. The pattern of expression of C.E.A. and E.M.A. differed. It was

suprabasal in 7 cases with C.E.A. and basal in 5 cases with (E.M.A.) . Although these differences may not be of diagnostic significance, the constant expression of krratin may provide a useful marker of inverted papilloma.

Table (1) : Shows the immuno - histochemical results of the nine cases, using the three epithelial markers.

Antibody	Normal Respiratory Epithelium		Tumour
	Respiratory epith.	Mucous Glands	
1) Antikeratin.	Negative	Negative	8 cases positive with moderate intensity.
2) Anti C. E. A.	Negative	Faint Positive	7 cases weak positive.
3) Anti E. M. A.	Weak positive.	Negative	5 cases weak positive.

Table (2) : Age, sex distribution.

Age / Years	Sex		Total
	Male	Female	
20 -	-	1	1
30 -	2	-	2
40 -	4	1	5
50 - 60	1	-	1
	7	2	9



Table (3) : Duration of symptoms of the patients studied .

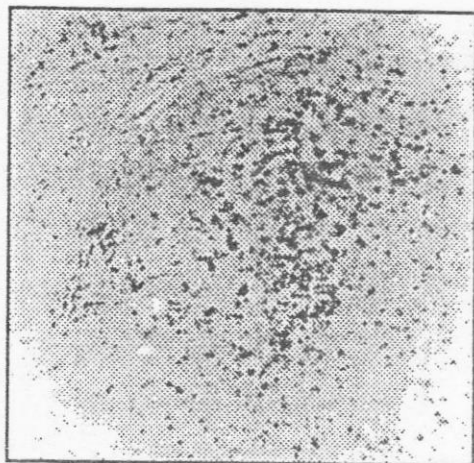
Duration	Number
Less than One year.	6
2 years.	2
3 or more years.	1
Total	9

Table (4) : Symptoms and signs of patients studied.

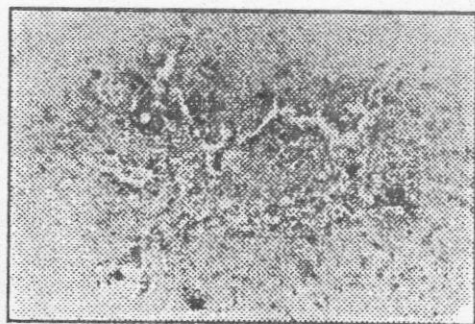
	Number
- Unilateral nasal obstruction.	9
- Rhinorrhoea.	5
- Epistaxis .	2
- Nasal mass.	3
- Pain .	7
- Proptosis .	7
- Epiphon .	2

Table (5) : Previous surgery performed to the patients.

	Number
Intra nasal polypectomy.	2
Coldwell .	2
Lateral.	-
Total	4



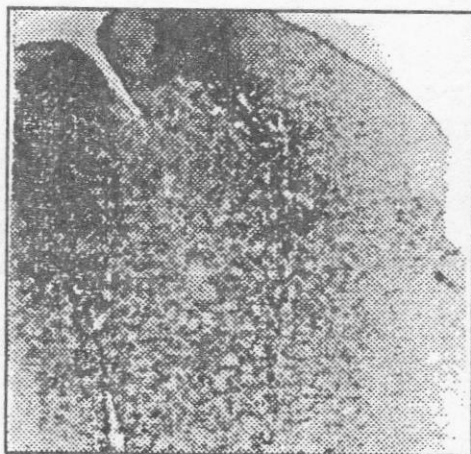
**Fig. 1 :** Immunoperoxidase staining of formalin fixed paraffin embedded inverted papilloma with antikeratin antibodies found diffuse in the cytoplasm of the cells. (X 100 ).



**Fig. 2 :** Immunoperoxidase staining of formalin fixed paraffin embedded inverted papilloma showing suprabasal antibodies of (C.E.A.) (X 100).



**Fig. 3 :** The same tumour shows basal staining of antibodies of (E.M.A.) (X 100).



**Fig. 4 :** Hx. and Eosin staining of inverted papilloma ( X 250).

## REFERENCES

- Grahm, R. M.; Chapman, D. V.; Richardson, T. C.; McKee, P. H. and Heydelman, E. (1980) : D.M. MacDonld, London Boston, Durban, pp. 55 - 59 Singapura, Sydney Toronto Wallington.
- Kamal, S. A. (1981) : J. Laryngol Otol, 95 : 106g - 70.
- Krisch, K. ; Krisch, I. and Horvat, G. (1985) : Histopathology, 9 : 1077 - 1089.
- Muraro, D.; Wynderlich, A.; Thor, J. : Kundy, P Noguchi, R.; Cunningham, R. and Sol-lom, J (1985) : Cancer Research 45 , 5769 - 5780.
- Naiem, M. J.; Gerdes, J.; Abdulaziz, Z.; Sunderland, C. A. Allincrtton, M J.; Stein, H. and Mason, D. Y. (1982) : J. of Immunological methods. 50, 145 -160.
- Ormerod, M. G.; Steele, K.; Westwood, J. H. and Mazzini, M N, (1983) : Brit. J. Cancer. 48 : 530 - 541.
- Schlegel, R.; Banks-Schlegel, S. : McLeod, J. A. and Pinkus, G.S. (1980) : Am. J. Pathol. 101 : 41 - 50.
- Snyder, R. N.; Perzin, K. H. (1972) : Cancer, 30 : 688 - 690.
- Van Olphen, A. F.; Lubsen, H. and Van Tveriaat, W. (1988) : J Laryngol Otol., 102 : 534 - 537.



## دراسة مناعية هستوكيميائية لدلالات الخلايا المبطنة في حالات الزوائد المقلوبة بالأنف والجيوب الأنفية

أجريت دراسات توضيح الكيراتين وانتيجينات السرطان الجنيني وانتيجينات الغشاء  
الطلائي على ٩ حالات من الزوائد المقلوبة بالأنف والجيوب الأنفية باستخدام طريقة  
البيروكسيداز المناعي غير المباشر على عينات مثبتة في الفورمالين ومغمورة بالبرافين .

وقد نتج عن هذه الدراسة وجود :

- ٨ من حالات كانت ايجابية للكيراتين .

- ٧ من ٩ حالات كانت ايجابية لانتيجينات السرطان الجنيني .

- ٥ من ٩ حالات كانت ايجابية لانتيجينات الغشاء الطلائي .

ورغم ان هذا الاختلاف قد لا يكون ذات اهمية تشخيصية فان ظهور الكيراتين دائما  
يمكن الاعتماد عليه كدليل نافع في تشخيص الزوائد الأنفية المقلوبة .

