Chinese Journal of Cancer Research 7(2): 134 - 140, 1995.

THE HISTOPATHOLOGICAL TYPING OF 48 CASES OF ESOPHAGEAL ADENOCARCINOMA AND ITS TISSUE ORIGIN

Huang Zhizhi 黄致治 Xie Fang 谢 芳 Tan Lijun 谭立军 Fu Yuangen 付员根

Department of Pathology, Medical College of Shantou University, Shantou, 515031

Of 2487 cases of esophageal carcinoma pathologically confirmed after resection in 1978—1988 in Shantou, adenocarcinoma accounted for 1.93% (48 cases). These were divided into 6 types; Ordinary well - differentiated adenocarcinoma, 10 cases; Ordinary poorly - differentiated adenocarcinoma, 11 cases; Adeno - squamous carcinoma, 18 cases; Muco - epidermoid carcinoma, 4 cases; "Basal Cell - Like Carcinoma", 4 cases; Cylindroma - Like carcinoma, 1 case. Mucohistochemistry and immunohistochemistry studies revealed some differences among these types; And their prognosis also varied. The tissue origin of these tumors were discussed.

Key Word: Tumor of esophagus, Adenocarcinoma, Muco-histochemistry, Immunohistochemistry.

Primary esophageal adenocarcinoma rarely occured. Only a few cases had been reported at home and abroad.[1-7] There was a high incidence ofesophageal carcinoma in Shantou area. We had retrospected the pathological records of the esophageal adenocarcinoma over the past 10 years in two representative unit in this area. This paper described pathohistological types, histochemistry, immunohistochemistry and biological behavior.

Accepted January 14, 1995

MATERIALS AND METHODS

2487 surgical samples of esophageal carcinoma that were examed in Shantou University Medical College and Shantou Central Hospital during the decade 1978—1988 were collected. Of which were 48 cases of esophageal adenocarcinoma. The selection criteria for esophageal adenocarcinoma were as follows: (1) The cancerous tissue was located within esophagus, not at cardia; (2) Adenoid structure was seen with routin paraffin - embeded specimen (H - E). Mucohistochemical stainings such as AB(pH 2.5), PAS and HID were performed in all cases to determine their subtypes. The immunohistochemistry of UCD/PR 10.11, Keratin, CEA and EMA were also done (ABC method and DAB colour reaction). All reagents were purchased from DAKO except that 10.11 was supplied by ZhongShan Medical University. In order to know the postoperative surviving period, we had followed up all the cases.

RESULTS

Clinical Records

Of all 48 cases (man 41, woman 7), the age ranged from 30 to 74, averaging 53. Their major

onset symptom was progressive dysphasia. The location of the tumor: 2 cases at the upper esophagus, 36 at the middle and 10 at the lower. The size of the tumors were 1.5—8 cm (length) with an average 4 cm. All had invaded the tunica muscularis. Observed with naked eyes: 20 cases in constrictive form, 12 medullary, 13 ulcerative, 3 undetermined. Of the 43 cases follow - ups (not including the 5 lost); 21 cases were still alive, 22 dead. The postoperative surviving period ranged from 2 months to 8 years.

Pathohistological Types

In reference to the WHO creteria (1977).[8] esophageal adenocarcinoma can be divided into 6 subtypes:

Ordinary Well Differentiated Adenocarcinoma

Of 10 cases in all (20.8%), 7 located at the middle esophagus, 3 at the lower. The mucosa of 6 cases was covered with squamous epithelium, 2 with column epithelium (i.e. Barrett's esophagus). The tumor was in the form of simple glandular tube, with dilated glandular cavity which was filled with red - dyeing or light - red - dyeing mucus. The cancerous tissue was widely distributed into the lamina propria, submucosa and tunica muscularis. The prognosis was fine, with 8 follow - ups still alive (average surviving period 39.4 months) and 2 lost.

Ordinary Poorly Differentiated Adenocarcinoma

Of 11 cases in all (22.9%), 7 located at the middle esophagus, 3 at the lower, 1 at the upper. The mucosa of 9 cases was covered with squamous epithelium, 1 with column epithelium. The tumor was in the form of solid mass, with small glandular cavity. The prognosis was poor, with 9 follow - ups dead (average post - operative surviving period 11.7 months) and 2 lost.

Adeno-squamous Carcinoma

The most common type. Of 18 cases in all (37.5%), the mucosa of 14 was covered with proliferative cancerous squamous epithelium. The tumor was composed of squamous epithelium solid glandular - tube cancerous nest. There were two combinations: 1. The glandular - tube component appearing within the squamous cell or basal cell nest; 2. The two being isolated. The prognosis varied greatly, with 10 follow - ups dead, 8 still alive, and the longest surviving period 8 years, the shortest 5 months, averaging 35.2 months.

Muco-epidermoid Carcinoma

Of 4 cases in all (8.3%), the mucosa was covered with squamous epithelium. The tumor was composed of mucus - secretory cells, intermediate cells and squamous cells, forming the mass, solid cord and adenocyst, etc. Mucus - secretory cells were in the form of column, cube which surrounded into glandular cavity filled with light - blue mucus or distributed among intermediate and squamous cell nests. The submucosa, tunica muscularis and adventia were invaded in all cases. The prognosis was the best, with 4 follow - ups all alive (average postoperative surviving period 54.2 months).

Cylindroma-like Carcinoma

Only 1 case. The tumor was typical cribriform (Figure 1). Still alive after 1 year follow - up.

Basal Cell Carcinoma

Four cases (8.3%). The mucosa was mainly composed of basaloid cell nests. There was hyaline degeneration in the stroma within basaloid cell nests, also seen irregular cavity space (Figure 2). The prognosis was poor, with 3 follow - ups dead (average postoperative surviving period 12.3 months) and 1 lost.

Mucohistochemistry and Immunohistochemistry

The mucohistochemical results of 48 cases of

sophageal adenocarcinoma were shown in Table 1. The mucus in the glandular cavity of the well and poorly ordinary differentiated adenocarcinoma was PAS and AB positive, i.e. neutral and acid mucus was mixed together, with the former the main part (Figure 3). As for most adeno - squamous carcinoma, the mucus also was mixed, but seven cases were acid. As for all muco - epidermoid carcinoma, the mucus of tumor cell and the glandular cavity were apparent acid (Figure 4). As for basaloid cell carcinoma, the hyaline degeneration in the stroma of the basaloid cell nests was PAS positive, forming speckles or petals. The mucin of cylindroma - like carcinoma was weak - positive for AB and HId.

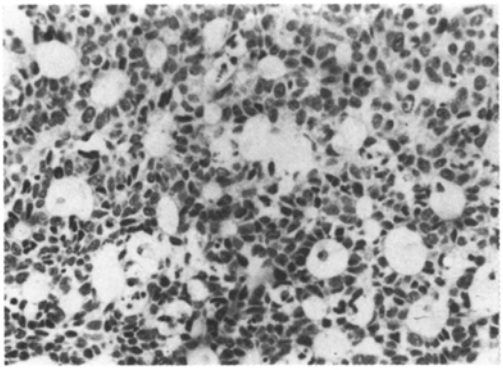

Fig.1. Cylindroma - like carcinoma HE ×200

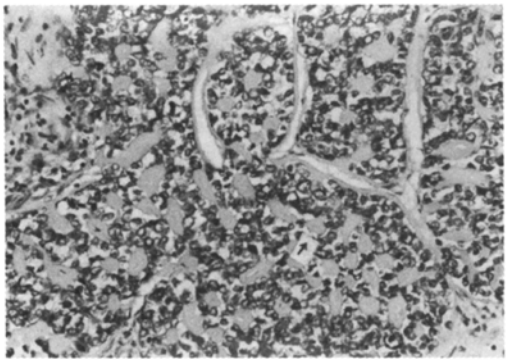

Fig. 2. Basal cell - like carcinoma, hyaline degeneration in the stroma within basaloid cell nests HE ×200

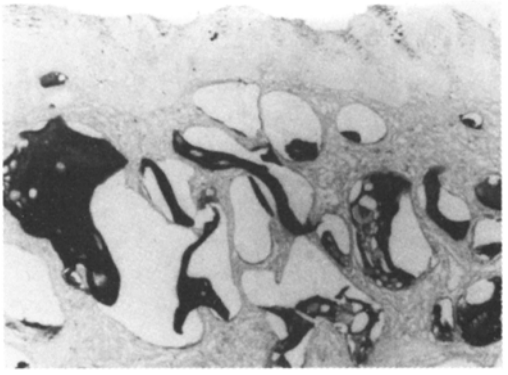

Fig. 3. Ordinary well differentiated adenocarcinoma. The mucus in the glandular cavity were P A S positive PAS.AB ×100

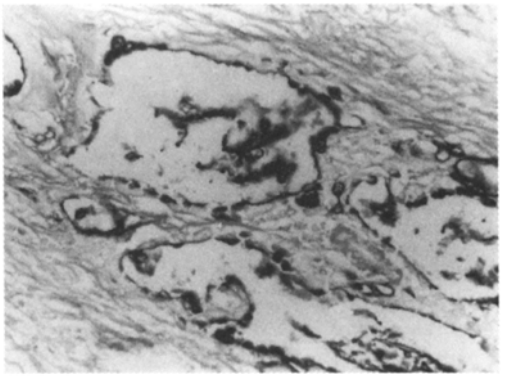

Fig.4. Muco - epidermid carcinoma. Cytoplasm of tumor cell and mucus of glandular cavity were AB positive PAS.AB ×200

The immunohistochemical results of 48 cases were shown in Table 2. The well and poorly ordinary differentiated adenocarcinoma were negative for keratin. But they were positive for 10.11, demonstrating their differentiation toward glandular epithelium. The well differentiated was strong positive for 10.11, most cells appeared membranous strong positive (Figure 5). However the poorly differentiated was mild positive for 10.11, but it exhibit strong positive for EMA in glandular - cavity - surface and plasm (Figure 6). Both adeno-squamous and muco-epitheloidcarcinoma

were positive for 10.11, EMA, CEA and keratin, demonstrating their differentiation toward squamous and glandular epithelium. Most of the basaloid cell carcinoma was immunohistochemical negative to the same 4 epithelium antibodies, only a few being keratin positive and EMA glandular - cavity - surface positive, demonstrating poor differentiation. The cylindroma - like carcinoma was also negative to the 4 antibodies above. It had a poor differentiation.

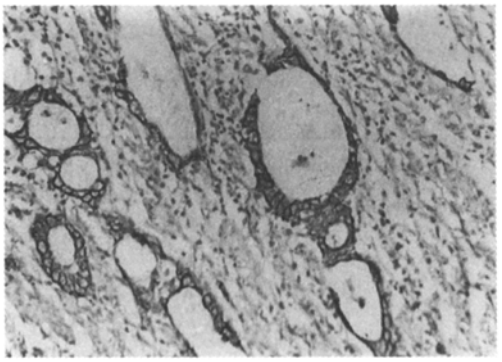

Fig. 5. Ordinary well differentiated carcinoma. The membrane of tumor cells were strong positive for 10.11 ABC × 200

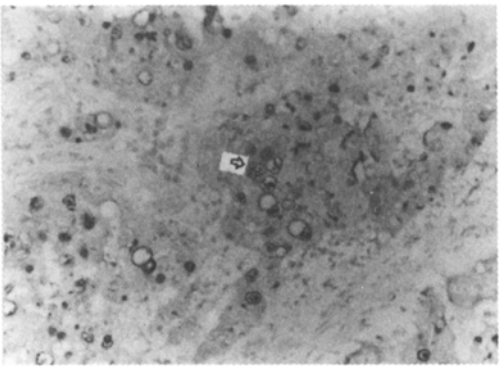

Fig. 6. Oridinary pooly differentiated adenocarcinoma. The cytoplasm were EMA positive ABC × 200

Table 1. Muco - histochemistry of 48 cases esophageal adeno - carcinoma

Histologic typing	No. of muco - histochemistry positive case				
	case	PAS	PAS.AB	AB	HID
Ordinary well differentiated	10		10		4
Ordinary pooly differentiated	11		11		1
Adeno - squamous	18		7	11	12
Muco - epidermoid	4			4	4
Cylindroma - like	1			1	1
Basal cell like	4	4			

DISCUSSION

There were different reports about the incidence of the primary esophageal adenocarcinoma (about 0.76—21% of all esophageal carcinoma).[1,2,4-7,9] Here we reported 48 cases of

adenocarcinoma out of 2487 cases of esophageal carcinoma (about 1.93%). By comparison, the incidence here seemed a little lower. It was inferred that the reason for the higher incidence in the former reports was due to misdiagnosing cardia adenocarcinoma which had invaded the lower esophagus as esophageal adenocarcinoma of the lower segment.

Table 2. Immunohistochemistry of 48 cases esophageal adeno - carcinoma

Histologic typing	No. of immunohistochemistry positive case				
	case	K*	10.11*	CEA	EMA
Oridinary well differentiated	10		10	10	10
Ordinary pooly differentiated	11		4	4	10
Adeno - squamous	18	18	18	18	18
Muco - epidermoid	4	4	4	4	4
Cylindroma like	1				
Basal cell like	4	2			2

*K: High molecular weight Keratin 10.11: Low molecular weight Keratin

The esophageal adenocarcinoma was divided into 4 histological subtypes by WHO.[8] We divided it into 6 subtypes according to the characteristics of its histological structure, cell differentiation, mucohistochemistry and immunohistochemistry.

Ordinary Well Differentiated Adenocarcinoma

The tumor was in the form of simple glandular tube. It was keratin negative, but 10.11 strong positive, demonstrating a differentiation toward simple glandular epithelium. The mucus his - tochemistry showed that mixed mucosa with the neutral the main part looked like that of the cardia mucosa and its glands, which suggested the tumor originated from the cardiac glands of the lamina propria of the esophageal mucosa, only 2 cases here from ectopic gastric mucosa (i. e. Barrett's esophagus).[4,10]

Ordinary Poorly Differentiated Adenocarcinoma

The tumor was in the form of solid mass with small glandular cavity. Its immunohistochemical and mucohistochemical findings were similar to the above type except that it was mild positive for 10.11 and strong positive for EMA, which demonstrated a poor differentiation toward glandular epithelium. Its origin was similar to the above type.

Muco-epidermoid Carcinoma

There was characteristic structure which composed of squamous cell, middle cell and mucus-secretory cell. The mucohistochemistry displayed sulphate acid mucus. These were very uniform with the gland of esophageal submucosa. It support this tumor originated from the esophageal gland.[3,7]

Adeno-squamous Carcinoma

The tumor was composed of definite squamous and glandular cancer nests, but without mucus-secretory cells, which was different from the muco-epitheloid carcinoma. Immunohistochemically, it was positive to the 4 epithelium antibodies, demonstrating a differentiation toward both squamous and glandular epithelium. Mucohistochemically shown mixed mucus with the acid being the main part, which was different from the neutral prevailing mixed mucus of the ordinary adenocarcinoma. Its histogenesis was comlicated. One was originated from squamous or basal cells, for only a few adenocarcinoma cells were among squamous or basal squamous cancer nests. The other was from both squamous epithelium and submucosa glands which were exposed to carcinogens simultaneously.[11] The squamous and glandular cancer nests were isolated from each other.

Cylindroma-like Carcinoma

It was also called adenoid cystic carcinoma by WHO because of its distinctive cribriform. There were various disputes over the histogenesis. Most of experts pointed out that it was originated from esophageal mucous gland.[4,7] For example, Sweeny believed it from the intercalated duct of the mucous gland.[12] However, Epstein thought that it was a kind of poorly differentiated basal cell carcinoma because of its significant atypia and strong invasiveness, which should be distinguished from the salivary "adenoid cystic carcinoma". We supported this viewpoint, for the case here was negative to the 4 epithelium antibodies, implying a poor differentiation and its great atypia. However, more cases should be accumulated.

Basaloid Cell Carcinoma

No such subtype in WHO typing. The tumor looked like basal cell carcinoma. There was hyaline degeneration in the stroma within basaloid cell nests. It appeared PAS positive, also seen irregular glandular cavity space. Immonohistochemically, only a few keratin and EMA positive lesions were found, demonstrating a poor differentiation and tendency toward squamous and glandular epithelium. Morphologically, it was similar to the dermal basal cell carcinoma, but its prognosis was much worse. Recently, Tsang reported[13] a group of such cases with a strong invasiveness and a poor prognosis, which were referred to as basaloid squamous cell carcinoma. He thought that they probably originated from multipotential Primitive cells which could differentiate toward epithelium, myoepithelium, etc. We agreed with the opinion.

So far there had been no agreement about the prognosis of the esophageal carcinoma. Neither of the cases was in early phase, all had invaded the tunica muscularis. Our follow - up study showed that the postoperative surviving period of the esophageal carcinoma differed greatly and was related to their histological subtypes. The prognosis of the muco - epidermoid carcinoma was the best, ordinary well differentiated adenocarcinoma the next, while ordinary poorly differentiated adenocarcinoma and basaloid cell carcinoma the worst.

REFERENCES

1. 杨乃普，邵令方，高宗人等. 食管腺癌.肿瘤防治研究 1986; 13(4):178.
2. 王弼. 钱宏. 食管腺癌. 肿瘤临床 1984; 11(2):99.
3. 范卿娣. 许锡禹. 食管原发行粘液表皮样癌二例报告. 中华病理学杂志 1987; 16(1):76.
4. Raphael HA, Eillis FH, Dockecty MB. Primary adenocarcinoma of the esophagus. Ann Surg 1966; 164: 785.
5. Turnbull ADM, Goodner JT. Primary adenocarcinoma of the esophagus. Cancer 1968; 22(11):915.
6. Lortat - Jacob JL, Mailland JN, Richard CA, et al. Primary esphageal adenocarcinoma: Report of 16 cases. Surgery 1968; 64(3):535.
7. Kuwano H, UEO H, Sugimachi K, et al. Glandular of mucin - secreting components in squamous cell carcinoma of esophgus. Cancer 1985; 56(3):514.
8. Cota K, Sobin LH. Histological typing of gastric and

esophageal tumors. Geneva; WHO. 1977.
9. Yang PC, Davis S. Incidence of the esophagus in the US by histologic type. Cancer 1988; 61:612.
10. Robey SS, Hamilton SR, Gupta PK, et al. Diagnostic value of cytopathology in barrett esophagus and associated carcinoma. Am J Clin Pathol 1988; 89(4): 493.
11. Epstein JI, Sears DL, Tucker RS. Carcinoma of the esophagus with adenoid cystic differentiation. Cancer 1984; 53(5):1131.
12. Sweeny EC, Cooney T. Adenoid cystic carcinoma of the esophagus. Cancer 1980; 45(6):1516.
13. Tsang WYW. Chan JKC, Lee KC, et al. Basaloid – squamous carcinoma of the upper aerodigestive tract and so – called adenoid cystic carcinoma of the esophagus: the same tumor type. Histopathology 1991; 19:35.