ADENOMATOID TUMOR OF THE EPIDIDYMIS WITH SPECIAL REFERENCE TO IMMUNOHISTOCHEMICAL STUDY OF 3 CASES

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Three cases of epididymal adenomatoid tumor are presented. The adenoid compositions of the tumors lined by epithelial cells showed a canalicular pattern with large vascular spaces, tubular pattern with glandlike regions or plexiform pattern with connective tissue strands. Immunohistochemistry demonstrated positive cytoplasmic staining for keratin, but negative for carcinoembryonic antigen and factor VIII-related antigen in each neoplastic tissue.

These findings support the mesothelial origin of the epididymal adenomatoid tumors.

Key words: Adenomatoid tumor, Epididymis, Keratin, Carcinoembryonic antigen, Factor VIII-related antigen

INTRODUCTION

Adenomatoid tumor is a well recognized benign lesion occassionally sprouting in the epididymis. As long ago as 1945, Golden and Ash[1] first termed this lesion "adenomatoid tumor" because of its inclination to compose sphere tubular constitutions. Extremely diverse histopathology of the adenomatoid tumor has been reported by sereval investigators who postulated that this neoplasm arises in mesothelial[2,3], endothelial[4], epithelial[1] or Müllerian[5] sites. In an earlier paper on this disease, the tumor histogenesis and ultrastructural characteristics of this tumor indicated mesothelial origin[6]. Immunochemical studies including factor VIII-related antigen showed somewhat contrapositive results[6,7].

We report 3 patients with this disease on whom extensive immunochemical studies were done to elucidate the histogenesis of this relatively uncommon disease.

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CASE REPORT

Case 1.

A 50-year-old man with no particular medical history incidentally found a painless mass in his right scrotum about a year ago. Clinical examination disclosed a round mass in the lower pole of the left epididymis. The tumor was removed. The specimen showed a round firm nodule measuring 1 cm in diameter. Its cut surface demonstrated gray homogenous nonencapsulated tumor arising from the epididymal tail. Light microscopy revealed 2 basic histological features: an epithelium-like cell pattern and fibrous tissue pattern. The former pattern exhibited various sizes of flattened tubular structures linked by epithelium-like lining cells. The fibrous stroma of the latter pattern was formed by bundles of muscle layers, collagen and elastic fibers and lymphocytes. Large "vascular" space lined by flattened cells, so-called canalicular pattern[8] were characteristically noted in both histological features (Fig. 1A).

Case 2.

A 36-year-old man had had a right painless mass in the scrotum for about 3

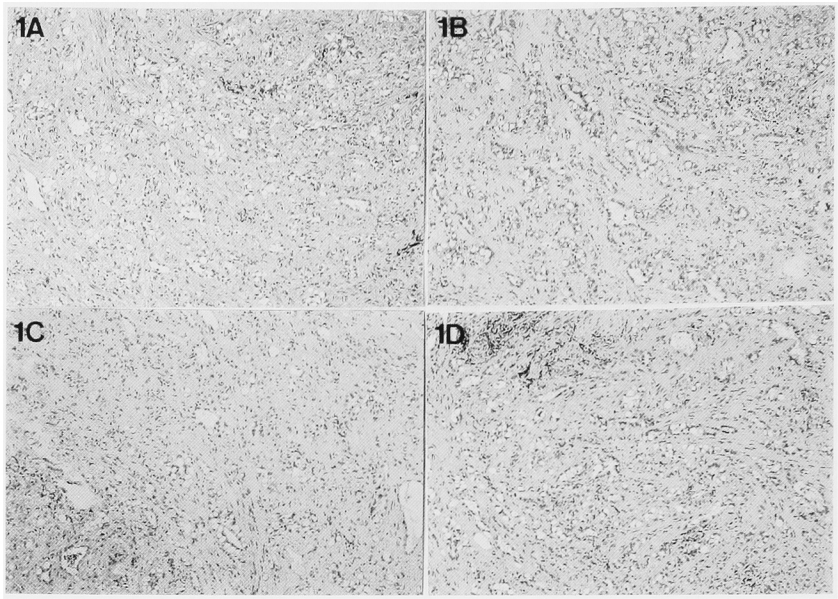

Fig. 1. Histological and immunohistochemical findings of case 1. Original magnification×25. A. Adenomatoid tumor of the left epididymis showing vascular spaces lined by flattened cells. HE stain. B. Staining for keratin. C. Non-staining for CEA. D. Non-staining for factor VIII-related antibodies.

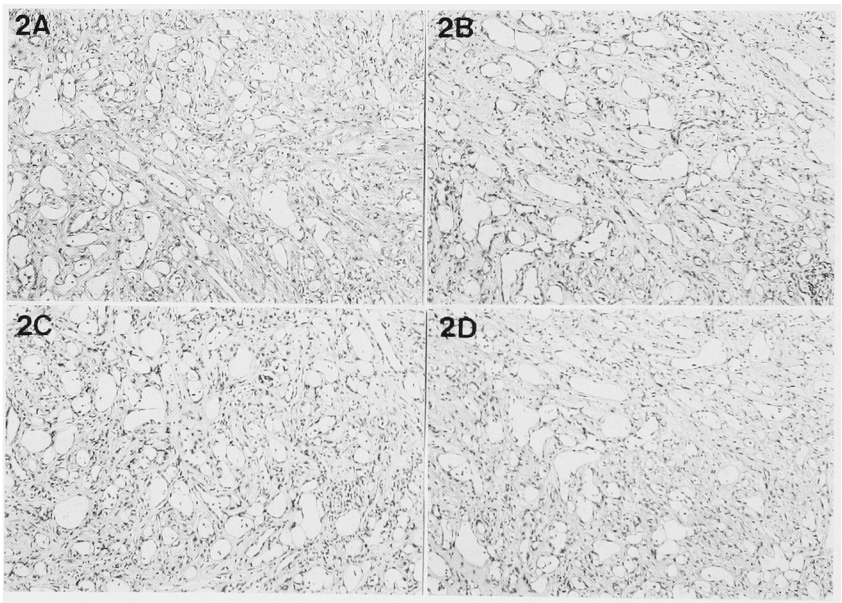

Fig. 2. Histological and immunohistochemical findings of case 2. Original magnification×25. A. Adenomatoid tumor in the scrotal cavity not related to testis or epididymis which consisted of small suboidal cells. HE stain. B. Staining for keratin. C. Non-staining for CEA. D. Non-staining for factor VIII-related antibodies.

years. There was no history of high fever-up or scrotal trauma. A round tumor approximately 1.5cm in diameter was removed from the soft tissue of scrotal cavity

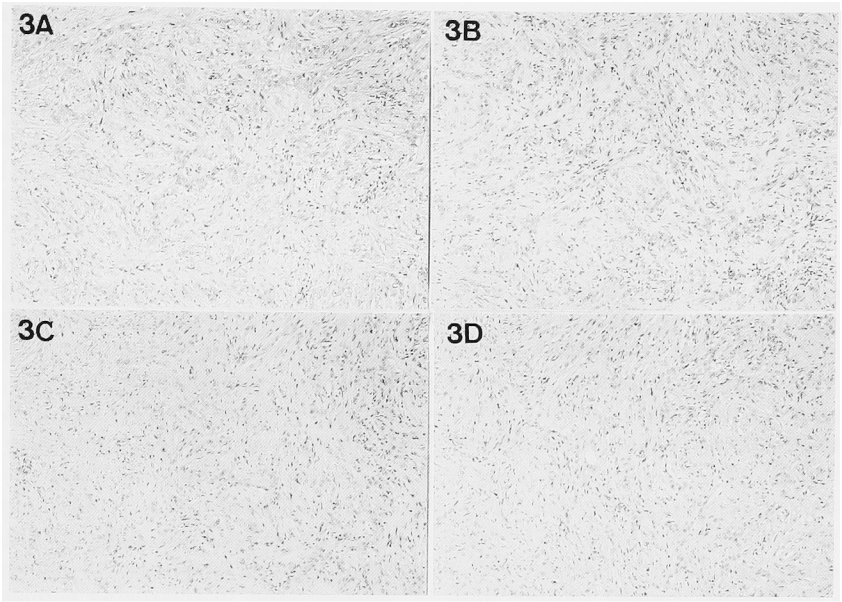

Fig. 3. Histological and immunohistochemical findings of case 3. Original magnification ×25. A. Adenomatoid tumor of the left epididymis showing solid strands and nests of epitheloid cells, so-called plexiform pattern. HE stain. B. Staining for keratin. C. Non-staining for CEA. D. Non-staining for factor VIII-related antibodies.

without connecting testis or epididymis. Post-operative course was satisfactory. The fibromuscular interstitium of removed specimen had a tubular pattern consisting of small cuboidal or flattened cells, some of which desquamated into the lumina. There were some lymphocytes dispersed throughout the tumor (Fig. 2A).

Case 3.

A 46-year-old man was referred to our clinic with swelling and tenderness of the left scrotum which he had had for about 1.2 years. At surgery, we found a round mass about 1.3 cm in diameter arising in the head of the left epididymis. The majority of the tumor was occupied with adenomatoid glandular cuboidal cells.

Most of the cells were found in aggregates in the intervening fibrous tissue. Predominant microscopic features were compatible with those of the plexiform pattern[8] composed of solid strands and nests of epitheloid cells (Fig. 3A).

MATERIALS AND METHODS

Tissues of the three tumors were prepared by a conventional method, after fixation with 10% buffered neutral formalin and were embedded in paraffin. For light microscopy, sections were stained with hematoxylin and eosin, PAS and alcian blue. Some sections were depar affinized in xylene and graded baths of alcohol. These sections for immunohistochemical study were prepared briefly as follows. Deparaffinized tissues were incubated in 0.5% hydrogen peroxide in methanol to evaculate the peroxidase activity. The horseradish peroxidase rabbit antihorseradish peroxidase complexes (PAP kit, DAKO Corporation, Santababara, California) were prepared for carcinoembryonic antigen (CEA). Some tissues were incubated in a test tube with antibodies to keratin, factor VIII-related antigen (Carbiochem-Behring Mthe-od Corporation, La Jolla, California) or normal sera in a similar to the tissue on the glass slides[9]. In the antibody specificity assay of these rabbit primary antibodies (CEA, keratin and factor VIII-related antigen), the concentration of each antibody was kept unalterable at a 1 : 100 dilution for 20 minutes at room tempera-

Table 1. Immunohistochemical study of epididymal adenomatoid tumor in 3 cases

Cases	Immunohistochemical findings		
	Keratin	CEA	Factor VIII-related antigen
1	+	−	−
2	+	−	−
3	+	−	−

ture, respectively. Negative controls were constituted by excluding the primary antiserum and substituting normal rabbit serum. Subsequently primary antibody was substituted with normal rabbit serum and tris buffered saline for each pathol ogical section[10].

RESULTS

Immunochemical stained sections of 3 neoplastic specimens showed similar findings (Table 1). In all specimens, densely stained keratin-materials were observed within the cytoplasm of lining epithelial-like cells or overlying solid strands (Figs. 1B-3B). By contrast, these adenomatoid tumors demonstrated no labeling with CEA (Figs. 1C-3C) and factor VIII-related antibodies (Figs. 1D-3D). There were no reactions in the negative controls.

DISCUSSION

An adenomatoid tumor is commonly asymptomatic, the finding being usually incidental as most cases in this study. Our cases fulfil the benign criteria originally described by Golden and Ash[1] though there are some differences in their respec tive histological findings. An early study indicated that this tumor was of angiomatous origin[4], Müllerian epithelial remnance[11] or Müllerian mesenchyme derivation[5]. Recent ultrastructural or histochemical analysis revealed that the adenomatoid tumor is of mesothelial origin[6,12]. The possible sources of this neoplasm include three types of cells[8]. The canalicular pattern has an excessive amount of vascular regions lined by flattened cells. The tubular pattern provides glandlike of piethelium-like cuboidal or low-columinar lining cells. The plexiform pattern was mainly composed of solid strands and nests of epitheloid cells. Misroscopic features of our case 1, case 2 and case 3 were compatible with those of canalicular pattern, tubular pattern and plexiform patterm, respectively (Figs. 1-3).

Davy et al.[13] ultrastructurally examined 3 epididymal tumors. Two of the three tumors possessed typical mesothelial characteristics, but one tumor showed a multilayered basal lamina which has been encountered in sclerosing hemangioma but not in mesotheliomas. Bell and Flotte[10] postulated that the epididymal mass categorized as adenomatoid tumors consists of two types of histological features. The first division of the tumor had mesothelial peculiarities as demonstrated in previous studies. Factor VIII-related antigen was noted in the endothelium of blood vessels in this tumor. The secend type of tumor demonstrated pervade cytoplasmic staining of the cells lining the lumina for factor VIII-related antigen, establishing the vascular endothelial feature of the component cells[10]. Suzuki et al.[14] speculated that the occurrence of all adenomatoid tumors has proximity to the adenomatoid type derived from Müllerian remnant tissue and the mesothelial type originated from pleural and peritoneal mesothelium. Indeed, there is proof that the mesothelium can be divided into epithelium, and mesenchymal-like cells, and transitional forms between the two. The mesothelial origin of epididymal adenomatoid tumor appears to be supported by various immunochemical studies[6,9,12,15,16]. Mesothelial cells as well as endothelial cells involve keratin as an intermediate filament class[17]. CEA has been demonstrated in various benign and malignant cells but has never been proved in adenomatoid tumors or in mesotheliomas[18,19]. Factor VIII-related

antigen has been regarded as a useful indicator of endothelial nature of tumor-uninvolved or tumor lesions[20]. Our staining characteristics (Table 1), positive for keratin, and negative for CEA and factor VIII-related antigen, have been considered characteristic of mesothelial derivation[21]. Although we found no evidence to support the endothelial derivation for adenomatoid tumors by the analysis of factor VIII-related antibodies, these antibodies appear to produce occasional erratic result of stain probably because of the quality of the antibody obtained from commercial sources[6]. In addition, we did not perform ultrastructural study. The electron microscopy is indispensable in determining the peculiality of the adenomatoid tumors and it may be difficult to localize a positive immunochemical reaction under light microscopy alone. Although an immunohistochemical study is atrtactive, further morphological studies will be necessary to prove the real origin of neoplastic tissues.

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和文抄録

精巣上体アデノマトイド腫瘍の免疫組織学的検索

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症例1は50歳男性で，左精巣上体尾部に発生した直径 1 cm の腫瘍であった．症例2は36歳男性で，右陰嚢内に生じた直径 1.5 cm の腫瘍で，精巣上体，精巣からは独立していた．症例3は46歳男性，左精巣上体頭部に生じた，直径 1.3 cm の腫瘍であった．

以上の3例のアデノマトイド腫瘍に対して免疫組織化学的検査（ケラチン，CEA，第Ⅷ因子関連抗原）を行った．結果は3例共，中皮細胞由来を示唆するものであった．さらに組織学的分類との比較を行い，若干の文献的考察を加えて報告した．

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