

Adenoid Cystic Carcinoma of the Prostate Gland

-Pathological Review with a Case Report-

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A case of adenoid cystic carcinoma of the prostate gland in a 38-year-old Korean man is described. Microscopically, variable patterns, that is, glandular, trabecular, cribriform and solid areas, were seen. The unusual location of this tumor in our patient highlights the ubiquitous distribution of this malignant neoplasm.

Key Words: Adenoid cystic carcinoma, prostate gland

Adenoid cystic carcinoma is an extremely uncommon but distinctive tumor in the prostate gland. It is frequently found in the major and minor salivary glands (Thackray *et al.* 1974) but has been infrequently described in the breast (Cavanzo *et al.* 1969), uterine cervix (Gallager *et al.* 1971), Cowper's gland (Carpenter *et al.* 1971), lacrimal gland (Adam *et al.* 1971), external ear (Althaus *et al.* 1970), upper respiratory tract (Ash *et al.* 1974), esophagus (Melms *et al.* 1972), and skin (Headington 1978). It is rarely found in the prostate gland and there have only been seven well documented reports written in English (Frankel *et al.* 1974; Tannenbaum 1975; Kramer *et al.* 1978; Kuhajda *et al.* 1984; Shong-Sanc *et al.* 1984; Gilmour *et al.* 1986; Young *et al.* 1988). When adenoid cystic carcinoma occurs in the prostate gland, it is not distinguishable clinically from ordinary adenocarcinoma other than that it tends to occur at a relatively younger age and serum acid phosphatase is within the normal range. The authors recently experienced a case of adenoid cystic carcinoma in the prostate gland of a 38-year-old male, and herein report it.

CASE REPORT

A 38-year-old man was admitted with nocturia and dysuria of 5 year's duration. Three to four months ago, urinary frequency and nocturia increased to 2-3 times per night. His past and family histories were unremarkable.

Rectal examination revealed an enlarged, stony hard, irregular prostate. Peripheral blood revealed normal hemoglobin 14.7g/dl, WBC 9,000/mm³, and platelet count 273,000/mm³. Serum acid phosphatase (1.3 u/1), BUN (14.0mg/dl), creatinine (0.9g/dl) and urinalysis were also within normal ranges. Computerized tomography revealed an enlarged prostate gland displacing the urinary bladder to an anterior superior position with signs of invasion into the seminal vesicle. This indicated that the tumor in the prostate gland was malignant. A transurethral prostatectomy resulted in a diagnosis of adenoid cystic carcinoma. A prostatectomy was then performed.

PATHOLOGIC FINDINGS

Gross findings

The prostatectomy specimen, 8x6x4cm in size and weighing 100 grams, consisted of the prostate gland and the seminal vesicle; it was relatively well demarcated from the surrounding tissue, irregularly oval in shape, light yellowish brown in color and

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Fig. 1. The cut surface shows a well-defined pinkish gray firm mass. The mass is lobulated by thin fibrous septae with foci of hemorrhagic necrosis and microcystic changes.

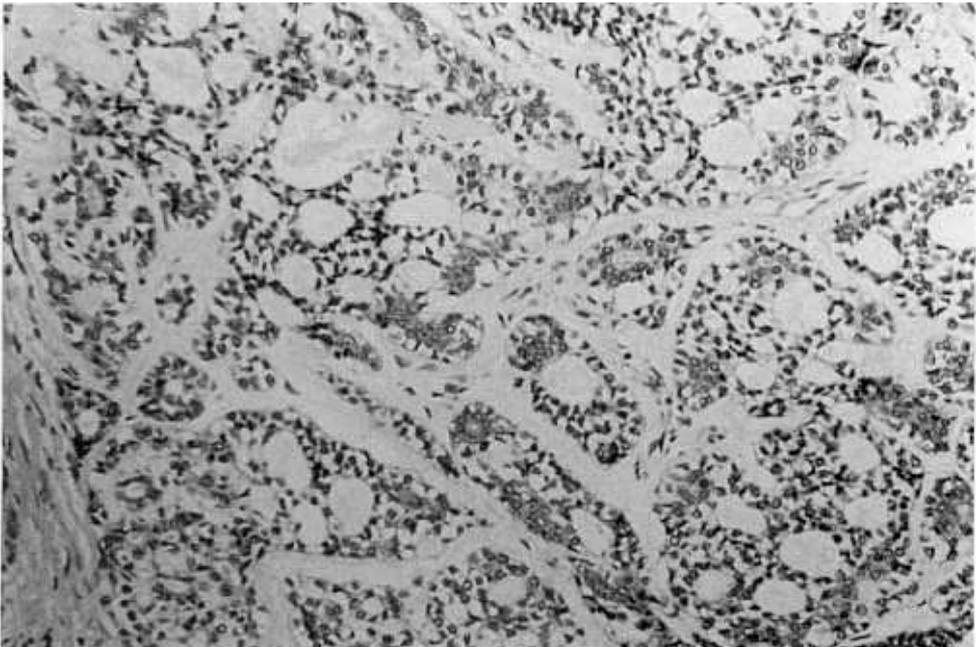


Fig. 2. The tumor shows a typical cribriform arrangement and most of the cystic spaces are filled with mucoid material(H & E, $\times 100$).

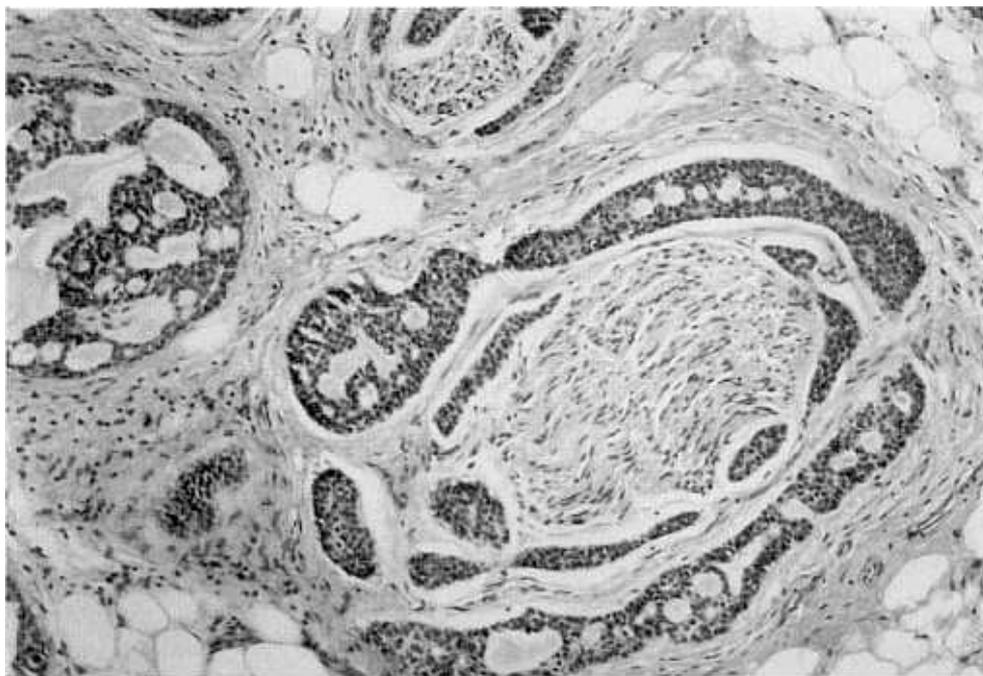


Fig. 3. Perineural involvement of adenoid cystic carcinoma (H & E, $\times 200$).

stony hard in consistency. The cut surface revealed several lobules separated by fibrous septa with discrete areas of hemorrhage, necrosis and cystic change (Fig. 1).

Microscopic findings

The tumor was not encapsulated with malignant cells invading the normal prostate tissue forming nodular growth. Variable patterns, that is, glandular, trabecular, cribriform and solid areas, were seen (Fig. 2) and within the lumen of the cribriform gland, eosinophilic amorphous material was found. The malignant cells had hyperchromatic nuclei with a few vacuoles within the cytoplasm that resembled myoepithelial cells, and frequent perineural invasion was observed (Fig. 3).

DISCUSSION

Adenoid cystic carcinoma was first described by Billroth in 1859 when he characterized a tumor with cribriform, glandular and basaloid patterns which contain a mucoid material and called it cylindromas (Billroth 1859). Later, Spies named it

adenoid cystic carcinomas (Spies 1930) and it was generalized by Foote and Frazell (1954), but it also called basiloma, adenocystic basiloid carcinoma or adenoepithelioma. Adenoid cystic carcinoma is a slow growing, indolent tumor with frequent recurrence and invasion into the surrounding organs but with slow systemic dissemination (Spies 1930; Thackray 1974). It usually occurs in the salivary glands and comprised 15% of the tumors arising in the minor salivary glands, 5% in the major salivary glands and 1.2% in the parotid glands (Thackray 1974). It has been reported to arise in the breast, uterine cervix, Cowper's gland, lacrimal gland, ear canal, upper airway, esophagus and skin. However, it is extremely rare in the prostate gland and less than 0.01% of the malignant tumors arising in the prostate are adenoid cystic carcinoma (Tannenbaum 1975). Frankel and Craig first reported it in 1974 in the English literature and only 8 well-documented examples have been described, even though there are several other reports described in less detail.

The origin of this tumor is unknown; electron microscopy of adenoid cystic carcinoma from the human salivary gland revealed two kinds of cells, myoepithelial and secretory. The cytoplasm of the

secretory cells contained basement membrane material and tonofilaments; with these substances it has been postulated that adenoid cystic carcinoma of the human salivary gland arises from the myoepithelial cells of the intercalated ducts of the salivary glands (Cavanzo *et al.* 1969; Thackray 1974). However, as yet, there is no evidence of myoepithelial cells or myoepithelial differentiation in the human prostate gland. Dickman *et al.* (1973) reported that ectopia of the seromucinous glands within the prostatic stroma was similar to that found in the salivary glands (Ash *et al.* 1974), and thus it can be suggested that some tumors of the prostate glands may have the same origin and histologic pattern as those of the salivary gland. Some authors insist that adenoid cystic carcinoma arises from the seromucinous glands of the external auditory canal, that is, the modified apocrine glands. Carpenter *et al.* (1971) reported a case of adenoid cystic carcinoma of the prostate gland and stated its origin as the Cowper's gland near the urethra. However, the latter can be characterized by clinical symptoms of rectal pain, pain during defecation, and constipation which made it possible to differentiate it from carcinoma arising from the prostate gland.

There have been very few reported cases of adenoid cystic carcinoma originating from the prostate gland, so no information regarding proper treatment method or prognosis is available. It is thought that the adenoid cystic carcinoma from the prostate gland is similar to that arising from the other parts of the body (Frankel *et al.* 1974), and in our case, the lengthy duration of symptoms suggested a slow rate of growth and that distant metastasis would not appear until a rather late stage. Eby *et al.* (1972) stated that the tumor could be differentiated histologically into 2 groups by the predominant patterns of cribriform or solid arrangement and reported that the former had a better prognosis than the latter, Batsakis *et al.* (1979), on the other hand, reported that only the origin of the tumor and the spread of the tumor clinically could determine its prognosis. No histological parameters which can forecast recurrence or metastasis have been described as yet. Surgical excision and radiotherapy have been suggested as the treatment of choice despite the high recurrence rate and death. Estrogen treatment is known to have no effect. This case is thought to be one of the rare types of tumors arising from the prostate gland and it is hoped that this report will give insight to future cases for treatment and prognosis.

REFERENCES

- Adams YG, Farr HW: Primary orbital tumors. *Am J Surg* 122: 726-731, 1971
- Althaus SR, Ross AT: Cerumen gland tumors. *Arch Otolaryngol* 92: 40-42, 1970
- Ash JE, Beck MR, Wikes JD: Tumors of the upper respiratory tract and tumors of the ear. In *Atlas of Tumor Pathology*: Washington, D.C: Armed Forces Institute of Pathology, Sec IV, Fasc. 12 & 13, 1964
- Batsakis JG: *Tumors of the Head and Neck*. 2nd ed. Baltimore, Williams and Wilkin's Co. 1979, 30-75
- Billroth T: Beobachtung über Gerchwulste der speicheldrüsen. *Virchows Arch Pathol Anat* 17: 357-375, 1959
- Carpenter AA, Bernardo JR: Adenoid cystic carcinoma of Cowper's gland: A case report. *J Urol* 106: 701-703, 1971
- Cavanzo FJ, Taylor HB: Adenoid cystic carcinoma of the breast: An analysis of 21 cases. *Cancer* 24: 740-745, 1969
- Dickman SH, Toker C: Seromucinous gland ectopia within prostatic stroma. *J Urol* 109: 852-853, 1973
- Eby LS, Johnson DS, Baker HW: Adenoid cystic carcinoma of the head and neck. *Cancer* 29: 1160-1168, 1972
- Fisher ER, Sierade TC: Ultrastructure of human normal and neoplastic prostate. *Pathol Ann* 5: 1-26, 1970
- Foote FW, Frazell EL: *Tumors of the major salivary glands*. In: *Atlas of Tumor Pathology*. Washington, D. C.: Armed Forces Institute of Pathology, Sec. IV, fasc, 11, 1954
- Frankel K, Craig JR: Adenoid cystic carcinoma of the prostate. *Am J Clin Pathol* 62: 639-645, 1974
- Gallager HS, Simpson CB, Ayala AG: Adenoid cystic carcinoma of the uterine cervix. *Cancer* 27: 1398-1402, 1971
- Gillmour AM, Bell TJ: Adenoid cystic carcinoma of the prostate. *Br J Urol* 58: 105-106, 1986
- Headington D: Primary adenoid cystic carcinoma of the skin. *Arch Dermatol* 114: 421-424, 1978
- Kramer SA, Bredael JJ, Kreuger RP: Adenoid cystic carcinoma of the prostate. Report of a case. *J Urol* 120: 383-384, 1978
- Kuhajda RP, Mann RG: Adenoid cystic carcinoma of the prostate. A case report with immunoperoxidase staining for prostatespecific acid phosphatase and prostate-specific antigen. *Am J Clin Pathol* 81: 257-260, 1984
- Manrique JJ, Albores-Saavedra J, Orantes A, Brandt H: Malignant mixed tumor of the salivary-gland type, Primary in the prostate. *Am J Clin Pathol* 70: 932-937, 1978
- Milms CD, Juna MA: Primary adenoid cystic carcinoma

- (cylindromatous carcinoma) of the esophagus. *Cancer* 29: 440-443, 1972
- Shong-San C, Walters M N-I: Adenoid cystic carcinoma of the prostate. Report of a case. *Pathol* 16: 337-338, 1984
- Spise JW: Adenoid cystic carcinoma: Generalized metastasis in 3 cases of basal cell type. *Arch Surg* 21: 365-404, 1930
- Tannenbaum M: Adenoid cystic or "salivary gland" carcinomas of the prostate. *Urol* 6: 238-239, 1975
- Tannenbaum M: Diagnostic criteria for histopathologic evaluation of prostatic tissue sections. *Urology* 5: 407-412, 1975
- Thackray AC, Lucas RB: *Tumors of the major salivary glands. Atlas of Pathology.* Washington D.C.: Armed Forces Institute of Pathology, sect. IV, fasc, 10, 1974, 91-99
- Young RH, Frierson HF, Mills SE, Kaiser JS, Talbot WH, Bhan AK: Adenoid cystic-like tumor of the prostate gland. A report of two cases and review of the literature on "adenoid cystic carcinoma" of the prostate. *Am J Clin Pathol* 89: 49-56, 1988
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