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Tumour of female paraurethral duct

Immunohistochemical similarity with prostatic carcinoma

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Summary. A case of adenocarcinoma derived from a female paraurethral duct is described. Morphologically the tumour looked like a prostatic adenocarcinoma. Furthermore, the tumour cells stained positively with antibodies to prostatic specific antigen and prostatic specific acid phosphatase. The karyotype of the patient was 45,x/46,xx/47,xxx/46,xt(x;13)(p11;q22) demonstrating that the patient was not a hermaphrodite. The tumour therefore represented female homology of a prostatic adenocarcinoma.

Key words: Female urethra – Paraurethral duct – Adenocarcinoma

Introduction

Neoplasms of the female urethra most often develop from the epithelial lining of the urethra or the paraurethral ducts and glands (Huffman 1951; Levine 1980; Peterson et al. 1973; Roberts and Melicow 1977). Like the male prostate, the paraurethral ducts and glands of the female originate from the urethral portion of the vesicourethral canal, the posterior urethral wall which is of wolffian duct origin, and perhaps to a greater extent from the urogenital sinus (Huffman 1948; Kellokumpu-Lehtinen 1980; Langman 1969).

Since neoplasms of female paraurethral ducts are rare, and since their origin have been a matter of controversy, we publish the following case.

Case report

A Caucasian woman born 1914 underwent in 1939 bilateral salpingooophorectomy and total hysterectomy followed by irradiation for an ovarian carcinoma (histological diagnosis in 1939: Carcinoma solidum inflammatorium ovarii). She was in good health until 1986, when she was hospitalized in the Department of Urology, Odense Hospital. An urethral tumour, clinically throught to represent a caruncle, was removed. The tumour measured 10 mm in diameter, with a white cut surface. Microscopically the urethral surface of the tumour was covered with normal transitional or non-keratinizing squamous epithelium. Proliferating glands of various forms were found just beneath the epithelial surface (Fig. 1). The glands were formed of a single-layered tall columnar epithelium with clear or slightly eosinophilic and granular cytoplasm, and slightly anaplastic nuclei. A cribriform growth pattern was seen in some areas. Infiltrating single files of epithelial cells were found in the surrounding fibromuscular stroma.

Immunohistochemical staining using 2-step indirect immunoperoxidase technique and antibodies to prostatic specific antigen (DAKO, diluted 1:400) and prostatic specific acid phosphatase (Miles Scientific, diluted 1:300) both showed strong cytoplasmatic reaction in many of the tumour cells (Fig. 2). Control sections included omittance of primary antibody, and substitution of primary antibody with non-immune rabbit serum. Control sections were constantly negative.

Step sections showed a paraurethral duct covered with pseudostratified cylindrical epithelium. However, in areas the ductal epithelium became papillary and dysplastic, and finally frankly invasive tumour cells were seen (Fig. 3).

The clinical examination including intravenous pyelogram, bone scintigrafic evaluation, serum lactic dehydrogenase and serum acid phosphatase were consistent with the clinical impression that the lesion represented a localized, radically removed primary urethral tumour.

Using lymphocytes the patient's karyotype was 45,x/46,xx/47,xxx/46,xt(x;13)(p11;q22).

Discussion

According to Huffman (1948) the ducts and glands around the female urethra were first described by de Graaf, who in 1672 called these structures the female prostate. However, they later acquired the name of Alexander Skene, who more than 200 years later in 1880 drew attention to two paraurethral ducts (Skene's ducts), and emphasized their importance in infection of the female genitalia. In a detailed study, Huffman (1948) stated that there

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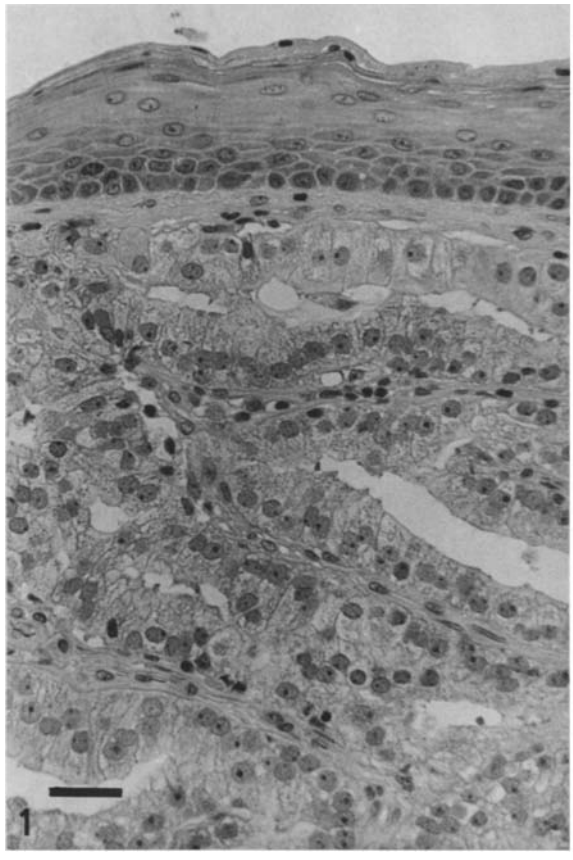

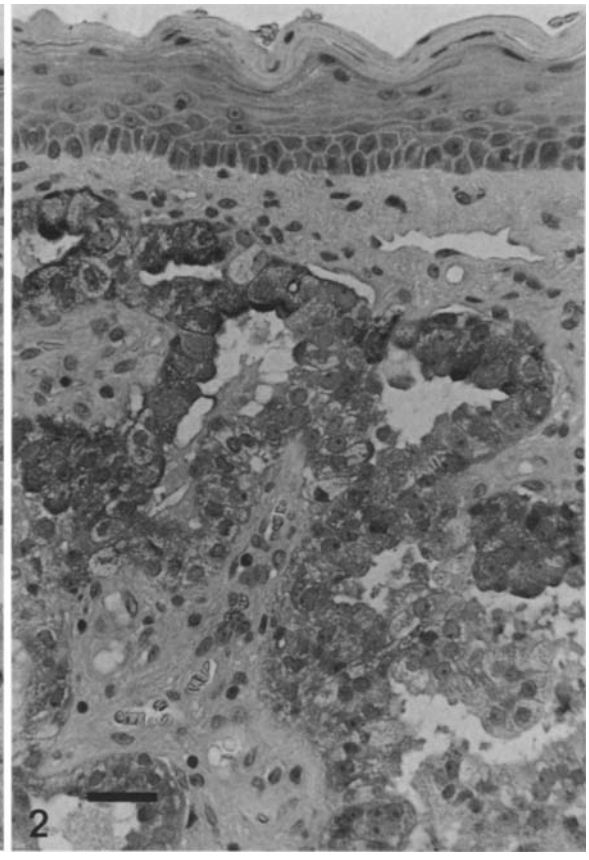

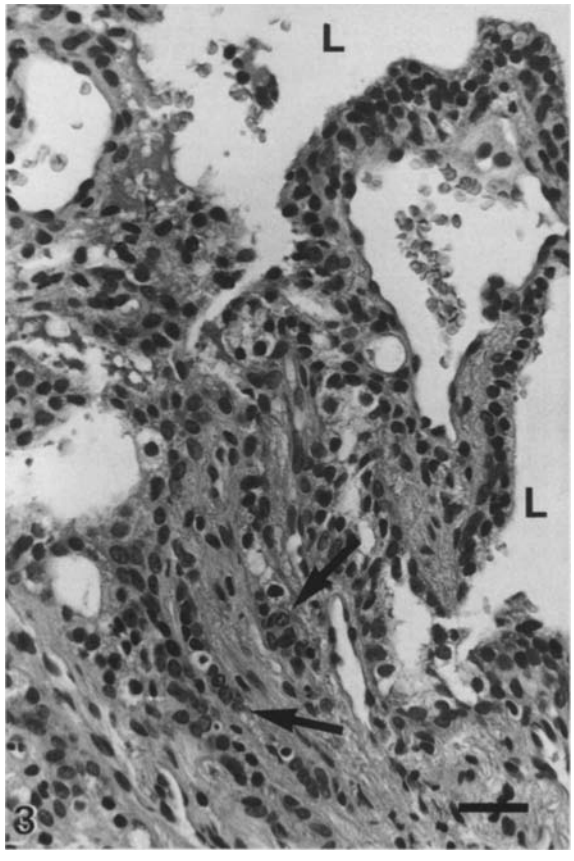

Fig. 1. Adenocarcinoma with proliferating glands of irregular size and forms were found just beyond the surface of the distal urethra, which in this area is covered with normal squamous epithelium. Haematoxylin & Eosin. Bar = 35 microns

Fig. 2. Section from same area as Fig. 1. Tumour cells show positive cytoplasmatic staining for prostatic specific antigen. Immunoperoxidase technique. Bar = 35 microns

Fig. 3. Section from paraurethral duct with area of invasive tumour cells (*arrow*). *L* = lumen of duct. Haematoxylin & Eosin. Bar = 35 microns

are numerous ducts and epithelial-lined pockets, which mostly empty into the distal third of the female urethra. Based on morphological and embryological findings, the female paraurethral ducts and glands have been considered to be the homology of the prostate gland (Huffman 1948; Zaviacic 1984), a consideration that has been made strongly probable by the finding of positive immunohistochemical staining using antibodies to prostatic specific antigen and prostatic specific acid phosphatase (Pollen and Dreilinger 1984; Tepper et al. 1984).

Prostatic specific antigen, a tissue specific glycoprotein with a molecular weight of 34000 daltons, has been claimed to be specific for benign and malignant epithelium of the prostate (Svanholm 1986). Prostatic specific acid phosphatase, an isoenzyme of acid phosphatase with a molecular weight of 100000 daltons, is not specific for prostatic epithelium, since it has also been found in some carcinoid tumours of the intestinal tract (Jöbsis et al. 1981; Sobin et al. 1986), and in some pancreatic islet cells and insulinomas (Jöbsis et al. 1981; Li et al. 1980).

Primary urethral carcinoma is usually a disease of later life (Groben et al. 1985; Kamat et al. 1981; Levine 1980; Peterson et al. 1973; Roberts and Melicow 1977). The majority of urethral neoplasms are squamous or urothelial in nature. However, approximately 10% of malignant tumours of female urethra have been reported as adenocarcinomas derived from paraurethral ducts and glands (Huffman 1951; Roberts and Melicow 1977). The morphological similarity between adenocarcinoma of the female urethra and prostatic carcinoma has been known for many decades (Huffman 1951). A few cases of clear cell adenocarcinoma of the female urethra have been published (Peven and Hidvegi 1985; Philipson et al. 1981; Tanabe et al. 1982). Peven and Hidvegi (1985) believe that clear-cell adenocarcinoma of the urethra are neoplasms of Müllerian duct origin, while Tanabe et al. (1982) suggest the possibility that these urethral tumours originate from mesonephric (Wolffian) nests. Histologically similar tumours have occured in the prostate (Tannenbaum 1977).

The paraurethral duct origin of our case seems to be beyond doubt, since a morphological relationship between a duct with dysplastic epithelium and the neoplasm could be shown. Single file infiltration of tumour cells in the surrounding stroma together with slight nuclear anaplasia seems to justify the diagnosis of a well-differentiated adenocarcinoma. The ductal- as well as the tumour cells, showed strong cytoplasmatic staining for prostatic specific antigen and prostatic specific acid phosphatase. To the best of our knowledge, this is the first time an immunohistochemical proof of the similarity between adenocarcinoma of a female paraurethral duct and prostatic carcinoma has been shown. Furthermore, the karyotype of the patient, although showing mosaic picture, clearly demonstrates that the patient is not a hermaphrodite, indicating this tumour being a female equivalent of prostatic adenocarcinoma.

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