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Prostatic tissue in testicular teratoma. A clinicopathologic and immunohistochemical study

Andres A. Roma MD [a,*], Peter A. Humphrey MD, PhD [b]

[a] Department of Anatomic Pathology, Pathology and Laboratory Medicine Institute, Cleveland Clinic, Cleveland, OH 44195, USA
[b] Division of Anatomic and Molecular Pathology, Department of Pathology and Immunology, Washington University School of Medicine, St Louis, MO 63110, USA

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ABSTRACT

The presence of prostatic differentiation as part of teratoma is very unusual and has been reported less than 20 times in the literature; however, all but 1 case were described in ovarian teratomas. We reviewed 45 specimens of germ cell tumors with teratoma component in postpuberal male patients. Original hematoxylin and eosin review failed to identify glands morphologically consistent with prostatic differentiation. Immunohistochemical stains performed on 10 specimens from 10 patients with small glandular and/or tubular structures revealed 1 case with glands positive for prostatic-specific antigen, prostatic-specific acid phosphatase, and prostein/P501S, whereas high-molecular-weight cytokeratin and p63 highlighted only basal cells. The glands were irregular in size and shape and contained mostly cuboidal to columnar luminal-type cells with occasional basal-type cells. Re-review of all the specimens revealed a second block from the same testis as well as 1 retroperitoneal lymph node with metastatic teratoma in the same patient, also immunohistochemically confirmed. These glands were seen in a smooth muscle stromal background, adjacent to classic gastrointestinal and tracheobronchial teratoma components. Our findings show immunohistochemically confirmed prostatic differentiation in 2 specimens from 1 patient with teratoma. This study raises the possibility that prostatic differentiation, difficult to recognize on morphology alone, might not be that unusual and that immunostains can help detect it over the several different epithelial components of teratoma.

1. Introduction

Prostatic component in teratoma is very unusual and has been reported about 20 times in the literature [1-12]. Interestingly, in all but 1 of those reports, the prostatic component was described in an ovarian teratoma. Unger et al [11] described a testicular tumor predominantly composed of seminoma with 1 nodule of prostatic-type tissue associated with small foci of squamous epithelium, most probably representing a teratoma component in the testis of a 46-year-old man. In a recent publication of 4 ovarian teratomas with prostatic tissue, the authors mentioned having seen areas of prostatic tissue in a testicular teratoma, but this case has not been published [12].

We reviewed all available testicular germ cell tumors with teratoma component at our institution and identified 2 specimens from 1 patient, with prostatic differentiation. The prostatic component overlooked on initial hematoxylin and eosin review was recognized after application of immunostains specific for prostatic differentiation.

We report this unusual component in a testicular teratoma, describe the clinicopathologic features, and discuss the immunohistochemical findings and differential diagnosis for this rare type of differentiation.

2. Material and methods

A search of the pathology database at the Lauren V. Ackerman Laboratory of Surgical Pathology was performed for germ cell tumors in men, with teratoma as part of its components, between January 1990 and June 2008. Epidermoid cysts were not included. Only cases with available slides were included. Slides retrieved were reviewed, and the original diagnosis was confirmed. Pertinent clinical and pathologic information as well as follow-up were captured.

A representative formalin-fixed, paraffin embedded tissue block from 10 specimens from 10 patients with small glands and ductular structures was selected for immunohistochemical study. All antibodies were prediluted from Ventana Medical Systems, Tucson, Ariz. Immunohistochemical stains for cytokeratin 7 (clone OV-TL 12/30), cytokeratin 20 (clone Ks20.8), prostate-specific antigen (PSA) (clone ER-PR8), α-fetoprotein (AFP) (polyclonal), and tumor-associated glycoprotein-72 (TAG-72) (clone B72.3) were performed using the standard streptavidin-biotin system on an automated immunostainer (Ventana

* Corresponding author. Tel.: +1 216 445 5194.
E-mail address: romaa@ccf.org (A.A. Roma).

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Bench XT, Tucson, Ariz). Proper positive and negative tissue controls were included. In 2 specimens, additional immunostains were performed, including prostatic-specific acid phosphatase (PSAP) (clone PASE/4LJ), prostein/P501S (clone 10E3; Dako, Carpinteria, Calif), high-molecular-weight cytokeratin (HMWCK) (clone 34βE12; Cell Marque, Rocklin, Calif), and p63/alpha-methylacyl-CoA racemase (AMACR) cocktail (clone 13H4/4A4; Zeta Corporation, Sierra Madre, Calif).

3. Results

Forty-five specimens from 41 patients were collected from the files with a diagnosis of germ cell tumor including teratoma as part of its components in postpuberal male patients aged 15 to 48 years (mean, 28.8 years; median, 29 years). Overall, specimens consisted of 19 testicular neoplasms, 20 retroperitoneal lymph node resections, 5 mediastinal tumors, and 1 pulmonary resection. Three patients had testicular and retroperitoneal lymph node resections available for review, and 1 patient had testicular and mediastinal resection available for review. Additional clinical and pathologic data have been previously published as part of a different study of teratomas in male patients [13].

Immunohistochemical stains were performed on medium- to small-size glands of uncertain origin in 10 specimens. One block from a testicular tumor specimen showed diffuse cytoplasmic positivity for PSA in a few glands. Immunostains for cytokeratins 7 and 20, AFP, and TAG-72 were negative. Re-review of this specimen revealed glands morphologically compatible with prostatic differentiation in 2 blocks. Subsequent re-review of the remaining 44 specimens showed 1 additional specimen (retroperitoneal lymph node resection) from the same index patient with glands compatible with prostatic differentiation. The PSA-positive glands were irregular in size and shape and contained mostly luminal type cells with occasional basal type cells (Figure A and B). Most were surrounded or adjacent to areas of smooth muscle. The luminal cells were cuboidal to columnar with small round nuclei and inconspicuous nucleoli. A few cells contained large to prominent nucleoli. The cytoplasm was pale to clear, especially the supranuclear region, and somewhat granular. The basal cells were small and flattened, located at the periphery of the glands with small nucleus, inconspicuous nucleoli, and scant cytoplasm. Similar glands with few or no basal type cells were also seen. The prostatic component was present in 2 of 8 sampled blocks of the testicular tumor, representing less than 5% of the sampled tissue. It was also seen in 1 slide in 1 of the 2 lymph nodes with metastatic teratoma of 25 lymph node resection specimen. The incidence of prostatic differentiation in male teratomas in our study is 4.4% (2/45 specimens).

Additional stains performed in 2 blocks from the testis and 1 from the retroperitoneal lymph node resection from the same patient revealed diffuse positivity in the prostatic-type glands for PSAP (cytoplasmic) as well as prostein/P501S (cytoplasmic and granular)

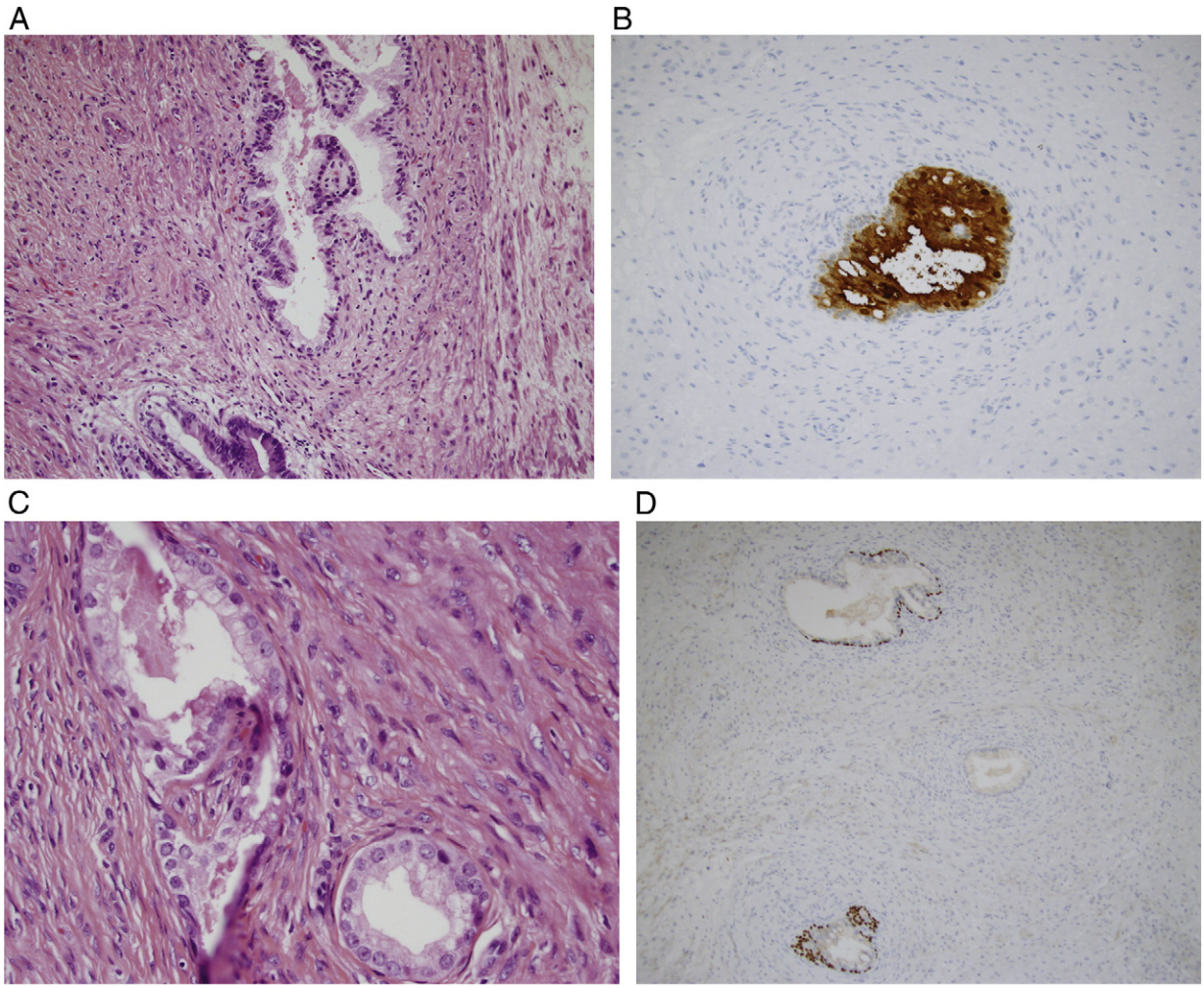

Figure. A, Prostatic-type gland surrounded by smooth muscle and adjacent to another mature glandular component of teratoma. B, Prostatic gland positive for PSA. C, Prostatic glands with prominent nucleoli and lack of basal cells suggestive of malignant transformation to adenocarcinoma. D, Some of the PSA and prostein/P501S–positive glands were negative for p63 and AMACR (racemase).