Serous cystadenoma of the tunica testis: A case of malignancy mimicry

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\textbf{ARTICLE INFO}

\textbf{Keywords:}
- Testis cancer
- Tunica cyst
- Germ cell tumor
- Borderline tumor

\textbf{ABSTRACT}

Cystadenoma of the tunica of the adult male testis has rarely been reported in the literature. We report a case of an adult serous cystadenoma along with the radiological and pathological findings. The patient was a 40-year-old male with a slowly growing mass on the left testis. An ultrasound scan of left testis showed features highly suspicious for malignancy. Lactate dehydrogenase (LDH) was mildly elevated at 236 units per liter (U/L) (normal range 60–200 U/L). We diagnosed his scrotal mass as likely testicular tumor and obtained informed consent for left radical orchiectomy.

The cut surface of the orchiectomy specimen displayed a hemorrhagic multicystic cystic lesion separate from the epididymis and connected to the tunica albuginea. The size of the tumor was $3.1 \times 3.0 \times 2.6$ cm and the size of the testis was $5.2 \times 4.2 \times 3.0$ cm (Fig. 2). Microscopically, focal ovarian-like stromal changes were present with less than 10% of the total surface area of the cyst comprised small papillary fronds. Immunohistochemistry demonstrated positive staining for WT-1, CK7, EMA, PAX 8, CD15 and estrogen receptor (ER), with negative staining for calretinin in the neoplastic cells (Fig. 3).

These pathological findings showed that the tumor was consistent with a serous cystadenoma of the tunica albuginea of the testis. The patient has no evidence of disease after 3 months of followup.

\section{1. Introduction}

Serous cystadenoma tumor is a rare subtype of para-testicular tumors with an incidence of 5.4 cases per 100000.\textsuperscript{1} Previously these tumors have been reported in the pancreas, retroperitoneum as well as epididymis and intra-testicular. Only one series has reported on serous cystadenoma in para-testicular sites, however, these were serous borderline tumors.\textsuperscript{2} Moreover, as there are currently no consensus guidelines on the recommended treatment or follow-up or for these tumors, we report serous cystadenoma tumor of the testis in a 40-year-old male, which was clinically suspected to be a testicular malignancy.

\section{2. Case report}

A 40-year-old male with a painless mass of the left testis presented to the emergency room with urosepsis from a known history of urolithiasis. On physical examination we noted a firm and painless solid mass of his left testis. A doppler ultrasound of the left testis showed a heterogeneously mild hypoechoic mass within the normal testicular parenchyma approximately $4 \times 2.7 \times 2.1$ cm with internal vascular flow. (Fig. 1). A computer tomographic (CT) scan of the abdomen and pelvis and chest X-ray did not reveal any lymphadenopathy. Tumor markers alpha-fetoprotein (AFP) and beta human chorionic gonadotropin (beta hCG) were within normal ranges. Lactate dehydrogenase (LDH) was mildly elevated at 236 units per liter (U/L) (normal range 60–200 U/L). We diagnosed his scrotal mass as likely testicular tumor and obtained informed consent for left radical orchiectomy.

The cut surface of the orchiectomy specimen displayed a hemorrhagic multicystic cystic lesion separate from the epididymis and connected to the tunica albuginea. The size of the tumor was $3.1 \times 3.0 \times 2.6$ cm and the size of the testis was $5.2 \times 4.2 \times 3.0$ cm (Fig. 2). Microscopically, focal ovarian-like stromal changes were present with less than 10% of the total surface area of the cyst comprised small papillary fronds. Immunohistochemistry demonstrated positive staining for WT-1, CK7, EMA, PAX 8, CD15 and estrogen receptor (ER), with negative staining for calretinin in the neoplastic cells (Fig. 3).

These pathological findings showed that the tumor was consistent with a serous cystadenoma of the tunica albuginea of the testis. The patient has no evidence of disease after 3 months of followup.

\section{3. Discussion}

Cystic neoplasms of the testis and paratestis are extremely rare. While serous cystadenoma has been rarely reported in locations that include the epididymis, to our knowledge, there have been no documented cases to date of serous cystadenoma arising specifically from the layer of the tunica albuginea. Müllerian-type epithelial neoplasms with serous differentiation demonstrate rare documentation within the
literature, with only one case series reporting serous borderline tumors of the adult tunica albuginea of the testis. This case highlights the need for clinicians and pathologists to recall the diagnosis of serous cystadenoma when investigating uncommon testicular tumors. This case also underscores the need for consensus guidelines in the management of these cases since the data is extremely limited.

There are several hypotheses for the histogenesis of ovarian epithelial tumors in testicular tissue. Some authors theorize these tumors arise from the remnants of Mullerian ducts that form the male appendix, testis, epididymis, and connective tissue between testis and epididymis and spermatic cord, while others postulate that the source of origin is the Mullerian metaplasia of the surface lining mesothelium and metaplasia of mesothelium within testicular parenchyma.

To support Mullerian and serous epithelial histogenesis among the neoplastic cells, while also ruling out pertinent differential diagnoses, we performed a standard panel of immunohistochemical stains. Immunohistochemical analysis was notable for positive staining of CK7 and EMA in the neoplastic cells, supporting epithelial differentiation. Since a major consideration in the differential diagnosis of serous tumors of the testis is malignant mesothelioma, it is worth mentioning that EMA highlighted the cells in a cytoplasmic pattern, in contrast to the membranous staining expected in malignant mesothelioma.

Additionally, CD15 and ER were positive, while calretinin was negative, further supporting evidence against malignant mesothelioma, which would demonstrate the opposite immunohistochemical staining profile. Thus, we confidently ruled out malignant mesothelioma. Positivity among the neoplastic cells for WT-1, PAX-8 and ER supported Mullerian differentiation. Serous histogenesis is supported by immunohistochemical positivity for WT-1, CK7, PAX-8 and ER, which are expected to be negative in mucinous cystadenomas of the testis. Additionally, the histological finding of predominantly cuboidal and columnar to focal ciliated cells supports serous morphology. Unlike mucinous cystadenomas, the observed neoplastic cells did not resemble endocervical-type or intestinal-type columnar epithelium.

Thus, we determined this to be a serous, rather than mucinous, cystadenoma.

The presence of less than 10% hierarchical papillary epithelial proliferations rules out the possibility of a borderline tumor, which is another important differential diagnostic entity. The neoplastic cells predominantly demonstrated mild nuclear features with inconspicuous mitotic activity. However, patchy areas of focal nucleomegaly, hyperchromasia and prominent nucleoli were observed. In the absence of the requisite architectural features of a borderline tumor, the significance of this focal atypia was uncertain. Thus, the case was diagnosed as a serous cystadenoma with focal epithelial proliferation. Therefore, the neoplastic cells demonstrated both histologic and immunohistochemical evidence of the diagnosis of serous cystadenoma while excluding diagnoses such as malignant mesothelioma, mucinous cystadenoma, and serous borderline tumor.

In conclusion, this is an extremely rare presentation of serous cystadenoma mimicking testicular malignancy. Our case report lends a
unique population being that it is, to our knowledge, the first serous cystadenoma of the tunica albuginea. Since gynecologic serous cystadenomas are well-established to involve a benign clinical course, and serous cystadenomas of the testis and paratestis display Mullerian differentiation, it stands to reason that they would likely follow a similar course as seen in their ovarian counterparts. Our patient remains asymptomatic, and we intend on pursuing close surveillance.

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