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CASE REPORT

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Ectopic prostatic tissue in the spleen

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Abstract Ectopic prostatic tissue was found in the spleen in a 49-year-old white man who died of widespread malignant mesothelioma. The prostatic origin of the tissue was affirmed by positive immunohistochemical staining for prostatic specific antigen and prostatic acid phosphatase.

Key words Prostate · Spleen · Choristoma

Introduction

A review of the literature on ectopic prostatic tissue reveals about 70 reports dating back to as early as 1894 [8]. Most of the reports deal with so-called prostatic polyps [15] or adenomatous polyps with prostatic-type epithelium [14], which can be found in the postpubertal male urethra, mainly in the prostatic portion, and the urinary bladder. They are clinically important as a significant cause of haematuria and haemospermia, predominantly in young men [3, 15].

Outside the urinary tract, ectopic prostatic tissue has been found in the epididymis [2], the root of the penis [23], the perirectal fat [7], the anal submucosa [13], the vascular pedicle of the prostate [1] and the retrovesical space [11, 18, 24]. In addition, Tokumitsu described heterotopic urogenital tissues, including the prostate, in a retroperitoneal lipoma [21]. All cases were in male patients. In female patients fully developed prostatic structures were identified in mature cystic teratomas of the ovary [12].

We present an incidental finding of ectopic prostatic tissue in the spleen.

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Case report

In April 1989 a 49-year-old white man was admitted to the university hospital because of increasing fatigue, weakness, a huge pleural effusion on the right side and recurring spontaneous pneumothoraces. The diagnosis of a malignant pleural mesothelioma was established by open lung biopsy. The patient died of respiratory failure in September 1991.

Pathological findings

At autopsy we found extensive masses of the malignant mesothelioma in the pleural cavity of both sides, with significant infiltration of the lung parenchyma predominantly along the lymphatic vessels. The tumour extended through the diaphragm to the peritoneum, including the splenic capsule. The spleen weighed 160 g and was normally situated under the left costal margin. On slicing the spleen, a 2×2 mm white spot was identified about 0.5 cm below the surface, resembling a metastasis of the malignant mesothelioma.

On histological examination of haematoxylin-eosin stained sections of the spleen, the lesion was found to consist of a trabeculum with a fibromuscular stroma surrounding some unregularly shaped tubular structures (Fig. 1). The tubules were lined with a single layer of cuboidal to flat epithelial cells with round to ovoid nuclei. Nucleoli and mitoses were absent. In some areas, a basal cell layer could be identified. Many of the gland lumina contained a homogeneous eosinophilic substance or laminated concretions resembling corpora amylacea, which were apparently compressing the lining epithelium.

It was shown by immunohistochemistry that a few tubular structures opening into the surrounding red pulp of the spleen were present. Furthermore, there were some epithelial cells lining the trabeculum and thus in direct contact with the red pulp. Immunohistochemically, most of the epithelial cells were strongly stained for pan-cytokeratin (Camon, monoclonal), prostate-specific antigen (PSA, Dako, monoclonal) (Fig. 2) and prostatic acid

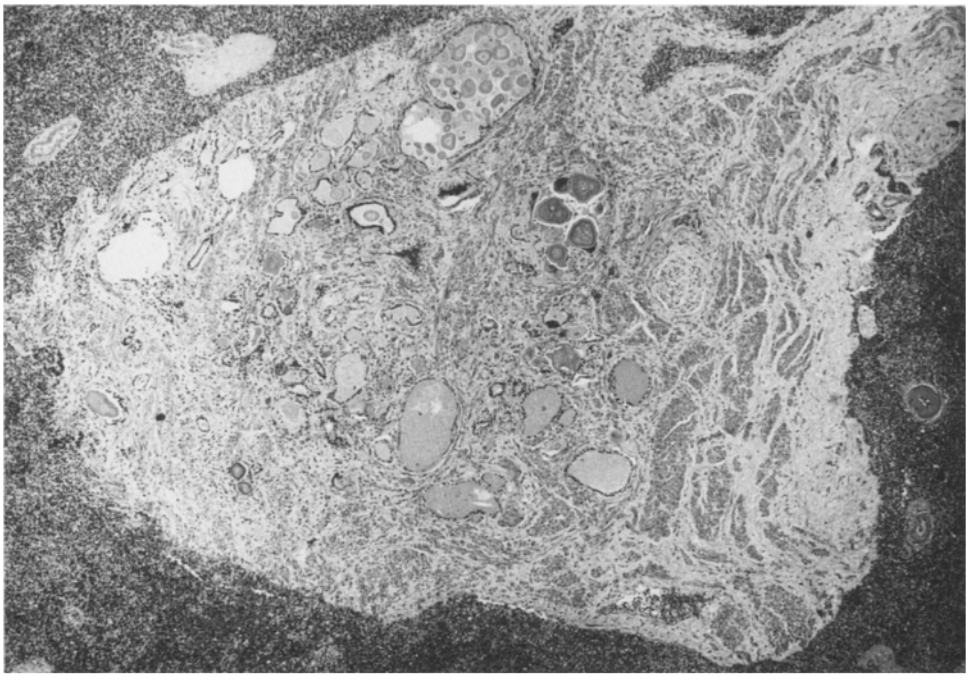

Fig. 1 Ectopic prostatic tissue. Fibromuscular stroma with acinar glands containing corpora amylacea surrounded by splenic red pulp. H&E ×50

Fig. 2 Glandular structures stained positively for prostatic specific antigen (*arrows*). ×400

phosphatase (PAP, Dako, monoclonal). Immunostaining for α-amylase (Sigma, polyclonal) and thyroglobulin (Dako, monoclonal) was negative both in the luminal cells and in the basal cells. Endocrine cells were not detected in the heterotopic epithelium by anti-neuron-specific enolase (Dako, monoclonal).

Additional immunohistochemical detection tests for androgen and oestrogen receptors in epithelial and stromal cells and molecular biological analysis of the androgen receptor gene (wild-type or mutant) [20] of the ectopic prostatic tissue could not be performed owing to lack of material.

The surface of the spleen was crowded with tubulopapillary structures of the mesothelioma displaying the epithelial type. Invasion of tumour cells into the splenic parenchyma was not found. Immunohistochemically, the tumour cells did not stain for prostatic specific antigen.

Because of the typical histological appearance of the lesion, the immunohistochemical staining and a macroscopically and microscopically normal prostate proper,

we exclude metastasis of an adenocarcinoma of the prostate and malignant mesothelioma as possible diagnosis, and believe the lesion to be ectopic prostatic tissue.

Discussion

Epithelial structures described in the spleen include so-called epithelial (true, primary) splenic cysts, which are lined with a single layer of flat to columnar cells (mesothelial cysts) or a more or less stratified epithelium (epidermoid cysts). The histogenesis of these epithelial cysts has been thought to be teratomatous (germ cells) [9], ectodermal (fetal squamous epithelium) [9], mesothelial (peritoneal mesothelium) [22], mesonephric (primordial Wolffian tissue) [6] or entodermal (foregut epithelium) [23]. Pancreatic tissue, an entodermal derivative, is reported to occur in the spleen. In 1925 Lubarsch [10] reviewed this topic and described pancreatic acinar glands and islets either embedded in trabecular structures or in direct contact to the pulp of the spleen. This phenomenon of epithelium in direct contact with the pulp was also detected in our case. Despite the morphological resemblance of the reported ectopic pancreatic structures to our tubular glands, the positive immunohistochemical reactions for PSA and PAP demonstrated a prostatic origin. The prostatic differentiation of the probably entodermally derived ectopic epithelium may have been influenced by the local environment. The importance of the surrounding mesenchyme for the differentiation of epithelium is elucidated by Cunha, for instance, who demonstrated that mouse embryonic mesenchymal cells of the urogenital sinus are capable of inducing prostate-like acini formation of adult mouse bladder epithelium [4]. The ectopic prostatic tissue in our case was clearly benign. Adams, however, reported a case of adenocarcinoma arising in ectopic prostatic tissue [1]. In the spleen pancreatic cystadenocarcinoma [17] and an endocrine pancreatic tumour [16] have been described.

Ectopic prostatic tissue may be of importance in patients with radical prostatectomy for prostate cancer. Like the prostate proper, ectopic prostatic tissue might contribute to the serum PSA level and therefore elevate the background noise level for ultrasensitive assays in patients after prostatectomy. This has also been suggested for the PSA-secreting remnants of cloacogenic glandular epithelium in normal urethral (Littre's glands, Morgagni's glands, Cowper's glands) [5] and anal glands in male patients [19].

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