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Case Report

Ectopic prostatic tissue involving the omentum and presenting with intussusception and small intestinal obstruction: A report of a rare case with a review of the literature

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ABSTRACT

Ectopic prostatic tissue has been uncommonly reported within the literature in the past, typically described involving areas within the lower genitourinary tract. Although patients can occasionally present with urinary symptoms related to the ectopic prostatic tissue, many of these cases are identified incidentally. Ectopic prostatic tissue, depending on the location, can represent a diagnostic dilemma for both clinicians and pathologists and generate a broad differential diagnosis that includes non-neoplastic and neoplastic proliferations, including both benign and malignant neoplasms.

Here we report a case of an 85-year-old male who presented with nausea, vomiting, and abdominal pain and was found to have an omental mass causing a distal small intestinal obstruction on pre-operative radiologic imaging, confirmed on exploratory laparotomy. A metastatic carcinoma was suspected clinically, as the patient had a known cystic lesion diffusely involving the pancreas. However, gross and histological evaluation of the specimen revealed an omental mass adherent to the small intestinal serosa that showed central infarction and features diagnostic of ectopic prostatic tissue, confirmed with immunohistochemical stains.

Introduction

Ectopic prostatic tissue is an uncommon and often incidental histological observation, with less than 100 cases having been reported in the literature. When present, ectopic prostatic tissue is most commonly seen in the lower genitourinary tract, particularly within the urinary bladder [1–4] and urethra [5,6]. Very rarely, ectopic prostatic tissue has also been described in other sites within the lower pelvic region [7–9]. For these cases in particular, this unexpected microscopic finding can pose a significant diagnostic dilemma, especially when a malignancy is clinically anticipated. We report an unusual and clinically unsuspected case of ectopic prostatic tissue within the omentum adherent to the small intestine with secondary intussusception and intestinal obstruction.

Case report

An 85-year-old male presented to the hospital with a 4–5-day history of generalized abdominal pain along with nausea and vomiting. His past medical and surgical history was significant for a cholecystectomy approximately 60 years ago, a right inguinal hernia repair 4 years prior and benign prostatic hyperplasia, status-post transurethral resection of the prostate, also 4 years ago. At the time of his prior surgical procedures, an incidental pancreatic mass was identified on an abdominal CT scan, determined to be hypermetabolic on a follow-up PET scan, though no further diagnostic work-up was reportedly done at the time. On initial examination within the emergency department his abdomen was soft, nondistended, nontender, and notable for a 10 cm scar from his prior cholecystectomy. A CT of the abdomen and pelvis with contrast was performed which showed evidence of a small intestinal obstruction characterized by dilation of the duodenum and jejunum over 5 cm, with a transition to nondistended ileum in the anterior left pelvis. This transition occurred adjacent to a 25 mm soft tissue nodule with associated calcifications (Fig. 1). This soft tissue nodule was 16 cm superior and left-lateral to the dome of the urinary bladder. Also appreciated on

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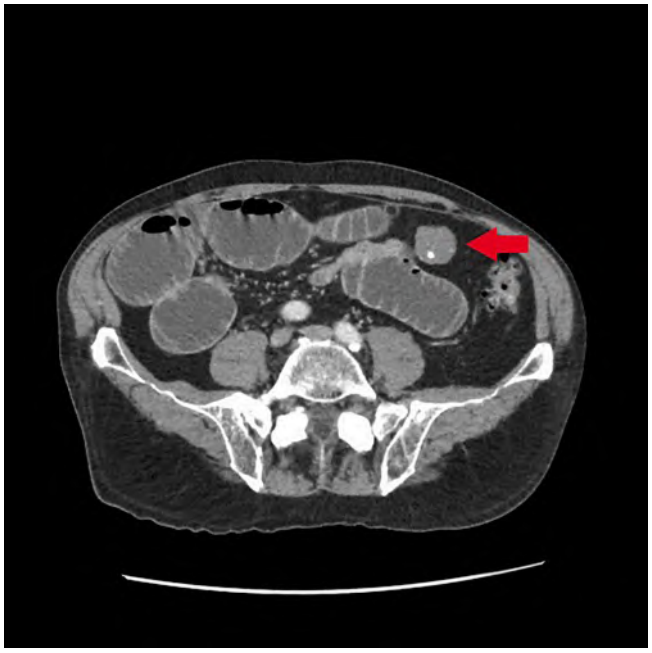

Fig. 1. CT scan of the abdomen and pelvis with contrast showing a 2.5 cm nodule with some associated calcification (arrow) within the soft tissue adjacent to a dilated loop of small intestine.

this imaging study were numerous cystic densities within the pancreas involving the head, body, and tail, measuring up to 3.7 cm in greatest dimension, with associated mild dilation of the main pancreatic duct. These latter findings were interpreted as possibly representing an intraductal papillary mucinous neoplasm (IPMN) of the pancreas, branch duct type. Based on these findings and the patient's presentation, the working diagnosis was that of a small bowel obstruction secondary to an adjacent soft tissue mass, possibly representing a metastasis from his pancreatic lesion. Therefore, he was decompressed with a nasogastric (NG) tube and taken to surgery for a small intestinal resection, to encompass the adjacent soft tissue mass. At the time of the exploratory laparotomy, a proximal dilation of the small intestine was identified extending to the distal jejunum/proximal ileum with a high-grade obstruction noted at the point of a serosal adhesion to an omental mass in the left lower quadrant of the abdomen. Therefore, a segmental resection of the distal small intestine was performed to include the adjacent adherent omental mass.

At the time of gross evaluation in pathology, a 20.0 cm in length portion of small intestine was identified with associated adherent omental adipose tissue, forming a convoluted structure measuring 8.9 × 6.5 × 3.4 cm. Upon sectioning, an area of intussusception was noted within the resected small intestine. External to this focus and within the omental adipose tissue, an adjacent 2.5 × 2.3 × 2.2 cm well circumscribed mass was identified with a tan-yellow, firm-to-rubbery, and greasy cut surface (Fig. 2). No mucosal abnormality was appreciated within the adjacent portion of intestine.

Microscopic evaluation of the mass revealed a well-circumscribed, though unencapsulated, mass within the omental adipose tissue composed of lobulated glands separated by hypocellular and fibrous stroma without evidence of desmoplasia (Fig. 3a and b). This mass was not attached to the small intestinal wall and the adjacent mucosa appeared unremarkable. The viable epithelial and stromal elements within the lesion were predominantly noted at the periphery of the mass, with large areas of central infarct-type necrosis associated with scattered dystrophic calcifications. The individual glands were lined by a layer of luminal epithelial cells with basally located nuclei and varying amounts of cytoplasm, ranging from voluminous and vacuolated within some of the more tufted epithelial structures (Fig. 3c) to scant within flattened cells lining the glands possessing a microcystic appearance (Fig. 3d). In addition to the luminal epithelial cells, the glands also appeared to have a second, outer layer of cells. No significant nuclear atypia or mitotic activity was appreciated, and no prominent inflammatory infiltrate was identified.

Immunohistochemical analysis of the mass revealed that the glands stained diffusely and strongly for NXK3.1 and PSA (Fig. 4a and b) within the luminal epithelial cells. A cytokeratin AE1/AE3 was also strongly positive within the glands. A p63 stain highlighted an outer basal layer associated with all of the glands (Fig. 4c). GATA3 also showed patchy and strong positivity within some of the glands (Fig. 4d). The cells were negative for CK7, CK20, calretinin, CDX2, PAX8 and SATB2.

In combination with the morphological and immunophenotypic features, a diagnosis of ectopic prostatic tissue involving the omentum with associated small intestinal intussusception was made.

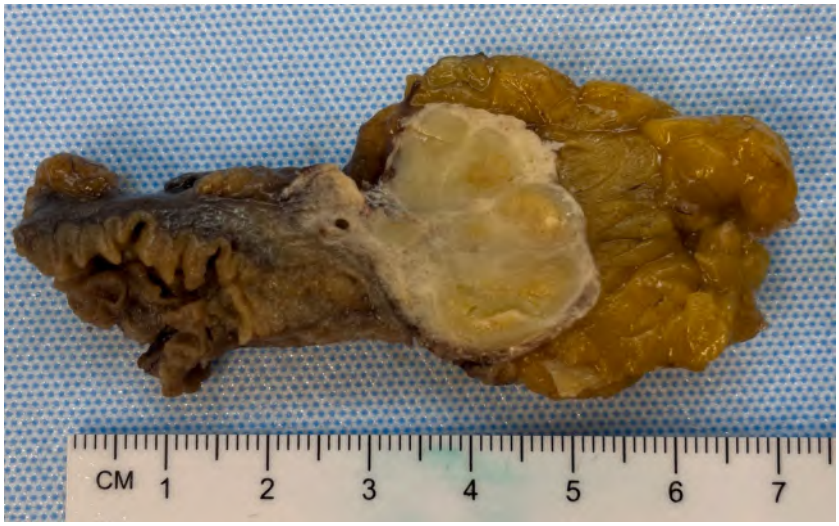

Fig. 2. A cross section from the small intestine segmental resection specimen with adjacent omentum showing a 2.5 cm well-defined, lobulated, and tan-yellow mass within the adipose tissue adherent to the serosa of the nearby small intestinal wall. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

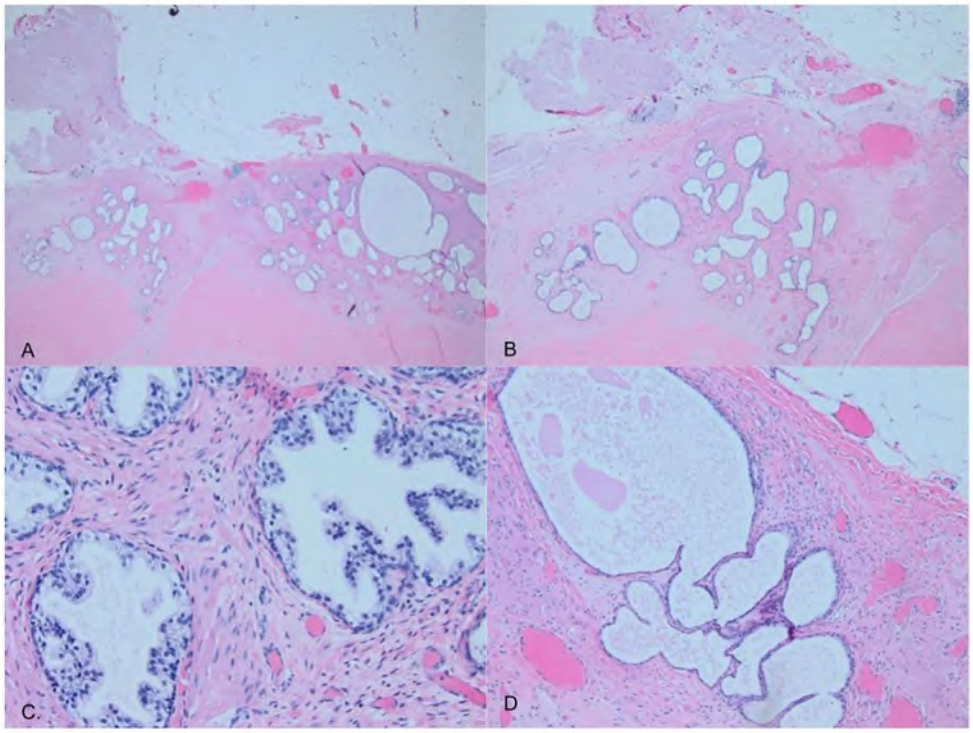

Fig. 3. Histological evaluation of the omental mass (Hematoxylin and Eosin stain). A. Low magnification examination showing peripherally situated, lobulated, and clustered glands with varying degrees of cystic dilation and centrally placed eosinophilic and necrotic stroma. B. Rounded to mildly irregular glands with an overall lobulated contour, associated with surrounding organized stroma. C. Glands lined by cells arranged in a tufted to papillary architecture with small nuclei and a modest to abundant amount of vacuolated and clear cytoplasm. D. A cluster of variably dilated glands filled with amorphous eosinophilic luminal contents and lined by bland, flattened cells.

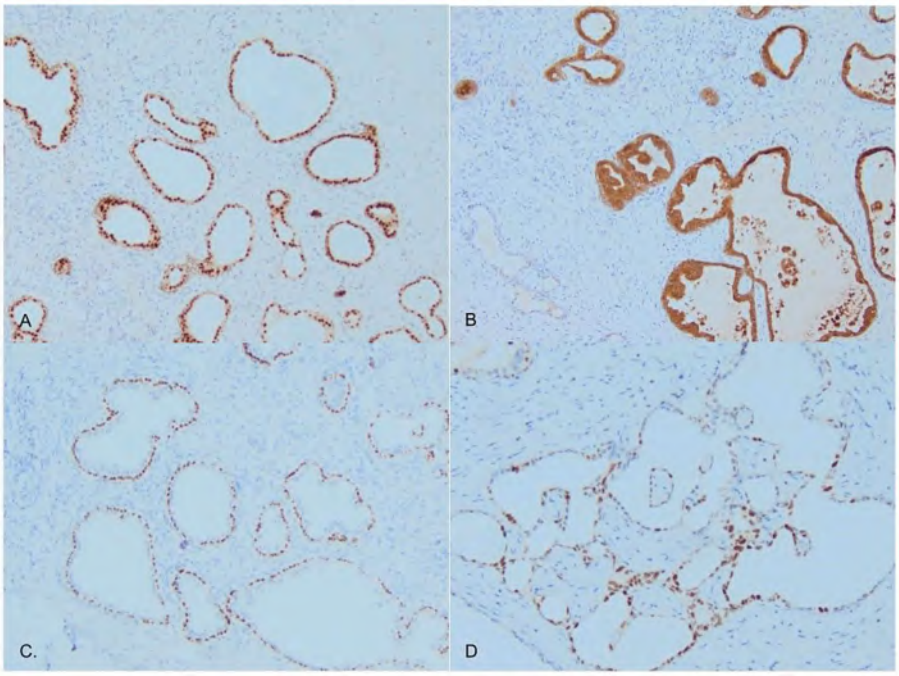

Fig. 4. Immunohistochemical features of the omental mass. A-B. NKX3.1 (A) and PSA (B) show diffuse and strong positivity, indicative of a prostatic origin. C. A p63 stain highlights a single layer of basal cells within all of the glands, supportive of the overall benign appearance of the prostatic tissue. D. A GATA3 stain shows patchy positivity of varying intensity within the ectopic prostatic glands.

Discussion

Ectopic prostatic tissue has only been uncommonly reported on in the medical literature, most often in the context of an incidental histologic finding or one associated with lower urinary tract symptoms. As mentioned previously, the vast majority of cases of ectopic prostatic tissue have been described associated with the urinary bladder and urethra [10,11]. In these examples, the tissue has been found to involve both the urothelial mucosa and submucosa [12–17], as well as the outer wall of the lower urinary tract [18–21]. Although often presenting as a mass on cystoscopy, most often related to a presentation with hematuria, ectopic prostatic tissue has also been associated with hydronephrosis

[22] and has been found to rarely undergo malignant transformation to a prostatic-type adenocarcinoma [23–25]. Ectopic prostatic tissue has also been reported in other sites within the genital tract, including the testis [26], seminal vesicle [27–28], and epididymis [29]. However, ectopic prostatic tissue is not restricted to individuals born as male, as it has also been described within the vagina [30], cervix [31–33], and within ovarian mature cystic teratomas [34,35]. Ectopic prostatic tissue has rarely been described in other locations within the body, including the gastrointestinal tract [36,37], pelvis [38], spleen [39], and unusually within an intradural lipoma arising in the spinal canal [40]. Although the ectopic prostatic tissue is typically solitary, a patient with multifocal ectopic prostatic tissue has also been reported [41]. However, as in our case, only exceptional cases of ectopic prostatic tissue outside of the urinary tract have been described in patients presenting with symptoms of bowel obstruction [42,43].

Although a rare microscopic finding in any situation, when outside the lower urinary tract, such as in this case where the mass-forming ectopic prostatic tissue was within the omentum and adjacent to the small intestine, the differential diagnosis of glands within tissue normally devoid of epithelial structures would be broad and reasonably include various malignancies. In this patient, particularly given the context of a suspected metastatic pancreatic malignancy arising in association with an IPMN, the microscopic appearance of the ectopic prostatic tissue, characterized by well-formed glands lined by bland epithelial cells with vacuolated cytoplasm showing a focally tufted architectural pattern would not be completely inconsistent with that pre-operative working diagnosis. Alternatively, the presence of tubular structures lined by epithelioid cells within the peritoneal cavity in this case could also reasonably represent a mesothelial proliferation. A confounding factor appreciated on immunohistochemical analysis in this case was the focally strong nuclear positivity for GATA3 identified within the ectopic prostatic tissue. The GATA3 positivity seen in this case predominantly highlights the basal cell layer of the ectopic prostatic tissue, though is also noted within some of the luminal epithelial cells. Although initially believed to be relatively specific for normal tissue and tumors of breast and urothelial origin [44], later studies have revealed positivity within many benign and malignant mesothelial processes [45], which in this case's context, could have led to a diagnostic consideration of a mesothelial neoplasm. However, GATA3 is often positive within basal cells, closely mirroring the p63 staining pattern in this case, and has also been specifically described within some reactive prostate glands [46], both of which are consistent with the patchy positivity seen within this patient's ectopic prostatic tissue.

The origin of ectopic prostatic tissue is somewhat controversial, though a remnant of developmental migration is favored by many authors [5,14,21,43]. Embryologically, prostatic tissue is present in early development as a condensation of mesenchymal tissue along the course of the pelvic urethra [47,48]. The inferior portion of the pelvic and penile urethra in males is formed from the urogenital sinus, which has its origins from the anterior portion of the cloaca, while the posterior portion of the cloaca forms the anal canal [49]. Although ectopic tissue identified at various sites within the body, including occasional cases of ectopic prostatic tissue, may occasionally have its origins from metaplasia secondary to inflammatory processes, in our case, there was no associated inflammatory infiltrate and no underlying epithelial-stromal lesion or neoplasm identified that could have undergone metaplastic transformation. Based on the known embryological developmental cascade, it seems likely that the ectopic prostatic tissue in our case, present within the omental adipose tissue, far superior to the dome of the bladder, likely originated secondary to early cloacogenic remnants influenced by androgenization.

Conclusion

Ectopic prostatic tissue is an uncommon histologic finding, often identified incidentally or with minimal urinary symptoms, and is only rarely seen outside of the lower genitourinary tract. However, this case demonstrates that it is important to consider this diagnosis outside of that limited anatomic distribution in order to avoid confusion with other non-neoplastic and neoplastic proliferations.

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CRediT authorship contribution statement

Tyler S. Yeager: Conceptualization, Writing – original draft. **Brandon C. Stroh:** Visualization. **Raphael El Youssef:** Validation. **Paul J. Michaels:** Methodology, Writing – review & editing, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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