Case Report

Acute Appendicitis as Primary Symptom of Prostatic Adenocarcinoma: Report of a Case

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The most common disease of appendix is acute appendicitis. There have been at least 20 case reports of metastasis-induced appendicitis in English literature. The authors reported a 62-year-old Thai man who underwent appendectomy due to classical symptoms and signs of acute appendicitis and was subsequently referred to Siriraj Hospital for proper management after a pathological report of metastatic adenocarcinoma to the appendix. By morphology, the primary site was thought to be the prostate gland. Confirmation was done based on serum PSA study, transrectal ultrasound-guided core needle biopsy, and review of the material from Hua Hin Hospital. Orchidectomy was performed with satisfactory outcome. The patient was doing well for two years before upper gastrointestinal hemorrhage and obstructive jaundice caused by another aggressive tumor developed. He died of the second tumor associated with subsequent renal failure in spite of good response to orchidectomy.

Keywords: Appendicitis, Metastatic prostatic carcinoma, Prostatic adenocarcinoma

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The appendix is a rudimentary structure with no obvious function arising from the medial wall of the cecum. Prominent lymphoid tissue in the mucosa, which is particularly prominent during adolescence, and neurogenous hyperplasia or appendiceal neuroma (formerly known as chronic appendicitis obliterans)[1] are considered as physiologic changes and traditionally are of no clinical significance. The most common disease affecting the appendix is acute appendicitis, which usually requires surgical resection[2]. Tumors, benign and malignant, of the appendix are uncommon. Metastatic tumors of the appendix are much rarer[2-3]. To date approximately twenty cases of well-documented cases appendicular metastases of proven malignant tumors from different organs have been recorded in English medical literature (Table 1)[6-25]. To the authors’ knowledge, appendicular metastasis from a prostatic carcinoma has never been reported. In the present report, the authors presented a unique case of metastasis to the appendix from a silent prostatic carcinoma with resultant acute appendicitis.

Case Report

In August 2005, a 62-year-old Thai man was referred from Hua Hin Hospital for proper management of questionable prostatic carcinoma. Two months earlier, he experienced acute right lower abdominal pain with classical symptoms and signs of acute appendicitis. According to the information from the referral request form, the excised appendix showed ill-defined, firm white induration involving the muscular wall and adjacent periappendicelial tissue grossly. Pathological diagnosis from Hua Hin Hospital was metastatic adenocarcinoma associated with acute appendicitis. Prostatic carcinoma was suspected to be the primary tumor site by morphology (no available slide or paraffin block for confirmation at that time). According to the information from the referral request form, the excised appendix showed ill-defined, firm white induration involving the muscular wall and adjacent periappendicelial tissue grossly. Pathological diagnosis from Hua Hin Hospital was metastatic adenocarcinoma associated with acute appendicitis. Prostatic carcinoma was suspected to be the primary tumor site by morphology (no available slide or paraffin block for confirmation at that time). Physical examination revealed only diffuse stony hard prostate without definite mass. His serum PSA (prior to any manipulation) was 158 ng/ml (normal = 0-4 ng/ml). Transrectal ultrasound-guided (TRUS) core needle biopsy of the prostate, performed two days later, showed high-grade prostatic adenocarcinoma involving both sides of the gland with intraprostatic
perineural invasion (Fig. 1). Subsequent review of the slide from Hua Hin Hospital confirmed metastatic adenocarcinoma to the appendix associated with acute appendicitis (Fig. 2). The neoplastic acini showed strong immunoreactivity for PSA, but negative reactivity for neuroendocrine cell (chromogranin A, synaptophysin, NSE, and S-100 protein), confirming prostastic origin of the tumor. Radionuclide bone scan (Tc-99m MDP) for metastatic foci was negative. Orchidectomy was performed two weeks after definite diagnosis. The serum PSA gradually decreased to 0.1 ng/dl in January 2006. The patient was doing well with low serum PSA until August 2007 when gastric ulcer with recurrent massive hemorrhage developed and shortly followed by obstructive jaundice. Diffuse dilatation of the biliary system, including the distal common bile duct compatible with obstructive mass lesion at pancreatic neck and multiple regional lymph node metastasis were shown in the CT scan. Subsequent renal failure was noted a month later. His latest serum 

Table 1. Cases of metastasis-induced acute appendicitis

<table>
<thead>
<tr>
<th>Case</th>
<th>Author</th>
<th>Primary tumor</th>
<th>Clinical manifestation/appendiceal status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moller (1984)</td>
<td>Gastric cancer</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>2</td>
<td>Ohnishi (1986)</td>
<td>Gallbladder carcinoma</td>
<td>Peritonitis</td>
</tr>
<tr>
<td>3</td>
<td>Gillesse (1987)</td>
<td>Cardia carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>4</td>
<td>Pang (1988)</td>
<td>Bronchogenic carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>5</td>
<td>Ciganak (1989)</td>
<td>Gastric carcinoma</td>
<td>Peritonitis</td>
</tr>
<tr>
<td>6</td>
<td>Maddox (1990)</td>
<td>Breast carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>7</td>
<td>Haed (1992)</td>
<td>Gastric carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>8</td>
<td>Hsu (1995)</td>
<td>Nasopharyngeal carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>9</td>
<td>Gopez (1997)</td>
<td>Bronchogenic carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>10</td>
<td>Rose (1997)</td>
<td>Ovarian carcinoma</td>
<td>Staging laparotomy</td>
</tr>
<tr>
<td>11</td>
<td>Wolf (1999)</td>
<td>Carcinoma of lung</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>12</td>
<td>Sudirman (2001)</td>
<td>Carcinoma of cervix</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>14</td>
<td>Goldstein (2004)</td>
<td>Small cell lung carcinoma</td>
<td>Acute appendicitis with perforation</td>
</tr>
<tr>
<td>15</td>
<td>Lin (2005)</td>
<td>Gastric carcinoma</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>16</td>
<td>Miyazaki (2005)</td>
<td>Lung adenocarcinoma</td>
<td>Appendiceal mass</td>
</tr>
<tr>
<td>17</td>
<td>Miller (2006)</td>
<td>Endometrial adenocarcinoma</td>
<td>Appendiceal mass</td>
</tr>
<tr>
<td>18</td>
<td>Fu (2007)</td>
<td>Gastric cancer</td>
<td>Appendiceal mass</td>
</tr>
<tr>
<td>19</td>
<td>Pina-Oviedo (2007)</td>
<td>Gastric carcinoma</td>
<td>Neurogenous hyperplasia (appendiceal neuroma)</td>
</tr>
</tbody>
</table>

Fig. 1 A) Core needle biopsy of the prostate (S48-15588) showing Gleason pattern 5 adenocarcinoma (H&E, x40) B) Perineural invasion (H&E, x600)
Discussion

Many cases of acute appendicitis follow luminal obstruction. The increased intraluminal pressure can cause injury to the mucosa with resultant impaired resistance to microorganisms\(^{26}\). The most common cause of obstruction is a fecalith, but any other conditions, such as tumors, can cause the same effect\(^{27-31}\). A study of 172 appendectomies in Siriraj Hospital in 1979 showed that fecaliths at least could accelerate the progression of inflammation, leading to gangrenous change, and perforation\(^{32}\). Cases with metastatic tumor caused acute appendicitis via this mechanism. The present case showed definite luminal narrowing caused by tumor nodule in the submucosa and muscular wall without mucosal change.

Tumors other than carcinoid tumors and adenocarcinomas when present in the appendix are easily recognized as metastatic, particularly when primary tumors in other organs are detected\(^{13,15,16,25}\). Adenocarcinomas with typical histologic features and specific tumor markers can also be easily detected by means of immunohistochemical study. The presented case is a good example. Typical prostatic pattern acini in H & E slide associated with strong immunoreactivity for PSA in immunohistochemical study prompted the diagnosis of metastatic prostatic adenocarcinoma. Negative immunoreactivity for chromogranin A, synaptophysin, NSE, and S-100 protein confirmed the absence of neuroendocrine cell. Other possible adenocarcinoma and primary carcinoid tumor with glandular pattern were all excluded.

Another helpful observation is the locations of metastatic tumors associated with apparently appendiceal normal mucosa (no dysplastic change). Tumor cells in the serosa, muscular wall, muscularis mucosae, and lymphatics are likely to be secondary\(^{5,9,11,14,33}\).

Patients with metastatic appendiceal tumors usually have poor prognosis\(^{5,34,35}\). However, if the appendix is the only organ involved associated with the nature of tumor, as in the presented case, prognosis might not be so poor. The presented patient did not die of prostatic carcinoma but he died with it but of another second advanced, aggressive tumor.

The common sites of metastases for prostatic carcinoma are pelvic lymph nodes, bone (with osteoblastic lesion), and lungs\(^{36,37}\). Liver, adrenal gland, large intestine, and central nervous system might occasionally be affected, particularly when estrogen is given\(^{38}\). Multiple organ involvements are frequent in advanced cancers. The authors failed to
detect any other involved organ in this case. It was possible that the appendix was the single site of metastasis.

Conclusion
The authors reported an extremely rare case of metastatic prostatic adenocarcinoma to the appendix causing clinical signs and symptoms of acute appendicitis. Confirmation of prostatic carcinoma was based on serum PSA level, TRUS prostatic core needle biopsy, and study of the previously removed appendix. Similar cases in the English literature were summarized. Careful examination of the gross specimen is helpful in detecting possible metastatic tumors in an inflamed appendix. To the authors' knowledge, this is the first case ever reported in English literature.

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References


