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Case Report

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Rectal Prolapse as an Initial Manifestation of Malignant Peritoneal Mesothelioma

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Abstract

Malignant peritoneal mesothelioma is a rare, aggressive tumor which typically grows as locally expansile mass. The recognized initial symptoms include abdominal pain and distention, anorexia, weight loss, fever, and a new onset inguinal hernia. Rectal prolapse as an initial clinical manifestation of malignant peritoneal mesothelioma has never been reported. We report an unusual case of a 90-year-old female with full-thickness rectal prolapse who underwent transperineal rectosigmoidectomy. Grossly, the resected bowel specimen displayed fine nodular lesions diffusely over the glistening peritoneal surface. Histologically, the nodules showed nests and solid sheets of atypical epithelioid tumor cells with foci of spindled tumor cells arranged in fascicles. The malignant cells displayed an expansile growth pattern. The tumor cells had enlarged and irregular nuclei with prominent nucleoli. Immunohistochemical studies showed the tumor cells were positive for calretinin, Wilms' Tumor 1 (WT1) and cytokeratin (CK 5/6), and negative for B72.3, MOC31, and carcinoembryonic antigen (CEA). Electron microscopic study showed numerous elongated microvilli and enlarged desmosomes. The final pathologic diagnosis of malignant peritoneal mesothelioma, biphasic type was rendered. This case suggests that malignant peritoneal mesothelioma should be a differential consideration for rectal prolapse.

Keywords: Malignant peritoneal mesothelioma; Peritoneum; Rectal prolapse

Introduction

Malignant peritoneal mesothelioma is a rare malignant neoplasm arising from the mesothelial lining of the peritoneum and occurs in the fifth to seventh decades of life with male predominance [1-4]. In the United States, the incidence is approximately 250 cases per year [5]. Malignant peritoneal mesothelioma displays expansile growth rather than infiltrative growth pattern in the abdominal cavity. Usually patients present with nonspecific symptoms such as abdominal pain and distention, anorexia, weight loss, fever, vomiting, and diarrhea [2-5]. Occasionally, a new onset hernia, including inguinal hernia [6-8], umbilical hernia [9], and abdominal wall hernia [10], is also observed. To the best of our knowledge, rectal prolapse as an initial manifestation of malignant peritoneal mesothelioma has never been reported.

Case Report

A 90-year-old asymptomatic female presented to our hospital with progressive rectal prolapse. Anorectal examination revealed a full-thickness rectal prolapse. Her vital signs were stable (blood pressure 107/73 mmHg; heart rate 78/min; body temperature (36.8 ° C). Laboratory data were unremarkable (hemoglobin 12.0 g/dL; platelets 363 x 10^3/uL; albumin 3.4 g/dL; total bilirubin 0.6 mg/dL; creatinine 0.5 mg/dL). The patient underwent transperineal rectosigmoidectomy. Upon approaching the peritoneal reflection, it was noted to be bulging due to ascites. The peritoneum was opened and a liter of light straw-colored ascites was evacuated. The site of interest was identified. Significant nodularity was noted on the serosal surface of the rectum. Subsequently a 6.3 cm in length of colon and rectum was resected. Gross examination revealed a 5.6 x 4.2 cm bowel specimen showing diffusely distributed tan nodules along the peritoneal surface. The prolapsed mucosa was dark purple and thickened. Cut surface of the nodules, which ranged from 0.2

to 2.0 cm in greatest dimension, was pale tan and occupied the serosa and subserosa. The mucosa and the muscularis propria were uninvolved. Microscopic examination revealed predominately solid nests and sheets of epithelioid tumor cells in an expansile growth pattern (Figure 1A and 1B). Approximately 10% of the tumor exhibited an irregular glandular appearance (Figure 1C and 1D). A sarcomatoid component with atypical spindle cells was also identified. These tumor cells were primarily seen in a fascicular growth pattern (Figure 1E and 1F). Tumor cells had enlarged and irregular nuclei with prominent nucleoli containing moderate amount of eosinophilic cytoplasm. Immunohistochemical studies were performed and revealed the tumor cells were diffusely and strongly positive for calretinin (Figure 2A), WT1 (Figure 2B), and CK 5/6 (Figure 2C), and negative for B72.3 (Figure 2D), ER (Figure 2E), MOC31 (not shown), and CEA (not shown), and focally weakly positive for p53 (Figure 2F). The electron microscopic examination showed numerous elongated, slender microvilli and enlarged desmosomes (Figure 3). Final pathologic diagnosis was malignant peritoneal mesothelioma, biphasic type. The patient was discharged and died four months after surgery. Chemotherapy was not pursued due to the advanced age of the patient.

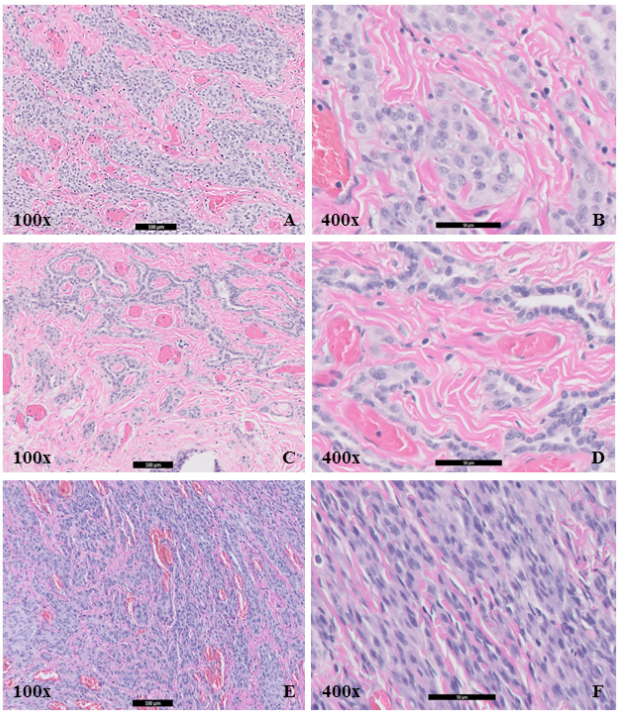

Figure 1: Histological findings of the malignant peritoneal mesothelioma (H&E stains). A (100x) and B (400x): Nests and sheets of malignant epithelioid mesothelioma cells showing enlarged and irregular nuclei with prominent nucleoli. C (100x) and D (400x): Malignant peritoneal mesothelioma displaying focal area of glandular architecture. E (100x) and F (400x): Focal area of atypical spindle cells arranged in fascicles.

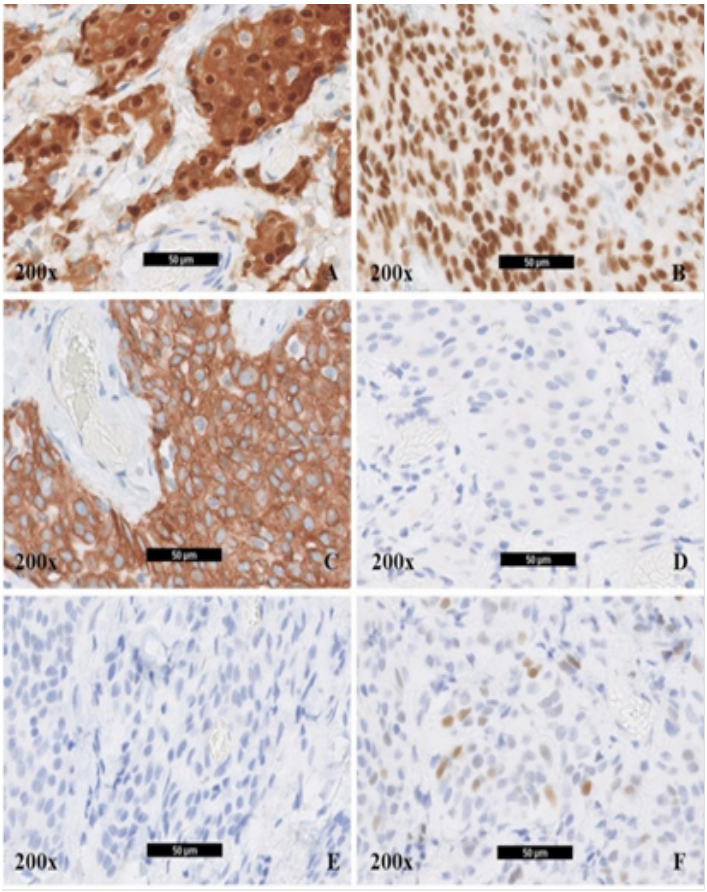

Figure 2: Immunohistochemical studies of malignant peritoneal mesothelioma (200x). Tumor cells were diffusely and strongly positive for calretinin (A). Wilms' tumor 1 (WT1) (B) and CK5/6 (C). Tumor cells were negative for B72.3 (D) and estrogen receptor (ER) (E). Tumor cells showed focally positive for P53 (F).

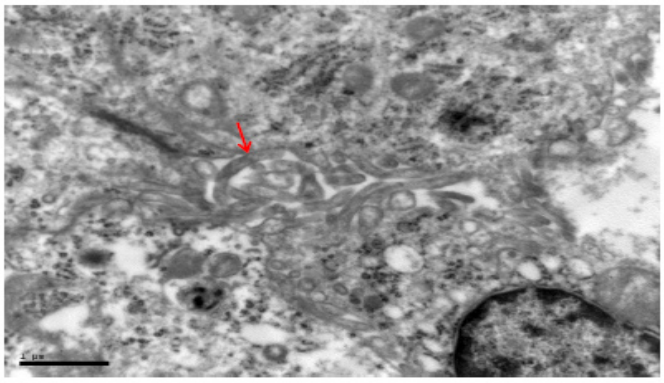

Figure 3: Electron microscopic examination of malignant peritoneal mesothelioma. **M**alignant mesothelial cells with numerous elongated and slender microvilli (indicated by an arrow). Enlarged desmosomes were also observed.

Discussion

This is the first case report of full-thickness rectal prolapse as an initial manifestation of malignant peritoneal mesothelioma. Rectal prolapse is defined as the protrusion of rectal layers through the anus [11]. There are three categories of rectal prolapse: complete prolapse, mucosal prolapse, and internal, or occult prolapse [11]. Complete rectal prolapse is the most severe form with a circumferential full-thickness rectal wall prolapse beyond the anus. Rectal prolapse is commonly seen in elderly women due to either a circumferential intussusception of recto-sigmoid colon or a sliding hernia through weakened pelvic floor muscles [11]. Rectal prolapse usually is benign, but is occasionally associated with neoplastic disorders such as colorectal adenocarcinoma [12,13] and rectal adenoma [14]. It is important to consider the possibility of malignancy in cases of rectal prolapse.

In malignant peritoneal mesothelioma, rectal prolapse may share similar mechanisms as hernias, one of the known symptoms of peritoneal mesothelioma. Malignant peritoneal mesothelioma causes various forms of hernia such as inguinal hernia [6-8], umbilical hernia [9], and abdominal wall hernia [10]. These hernias are likely secondary to increased abdominal pressure from the expanding tumor mass and associated ascites as well as weakened abdominal wall musculature. In our case, we postulate that weakened abdominal floor muscles, in part due to her advanced age, and the increased intra-abdominal pressure from the expanding mass and accumulated ascites fluid, was sufficient to induce rectal prolapse.

We performed histologic, immunohistochemical and electron microscopic examinations to render a final diagnosis of malignant peritoneal mesothelioma. Malignant mesothelioma is classified into epithelioid, sarcomatoid, biphasic, and desmoplastic types [2]. Our case showed a predominantly epithelioid component admixed with a focal area of sarcomatoid component. As the sarcomatoid component comprised more than 10% of the tumor, a diagnosis of biphasic type was made. Immunohistochemical stains showed a typical pattern of mesothelioma. Both epithelioid and spindle components were positive for calretinin, WT1 and CK5/6, and negative for B72.3, MOC31, CEA and ER. Furthermore, electron microscopic study showed numerous elongated microvilli and enlarged desmosomes, a typical feature of malignant mesothelioma [15].

Prognosis of malignant peritoneal mesothelioma is poor, with a median survival time less than one year [16]. In a proposed clinical classification by de Pangher Manzini, three clinical presentations are usually seen: classic, medical and surgical. In the classic presentation, patients usually manifest abdominal pain, ascites, and abdominal mass. In the medical presentation, patients experience fatigue, fever, anorexia, vomiting, diarrhea, and weight loss with an increased erythrocyte sedimentation rate, anemia, and thrombocytosis. In the surgical presentation, patients often present with hernia, ileus and intestinal perforation [17]. The median survival times range from 6 months for the medical presentation to 17 months for the classic presentation. The surgical presentation, as was the case for our patient has a median survival time of 12 months. Our patient was lost to immediate post-surgical follow up and was deceased in four months.

Conclusion

In summary, we present a case of rectal prolapse as an initial manifestation of malignant peritoneal mesothelioma. Malignant peritoneal mesothelioma is a rare disease and will go undetected by commonly utilized methods designed to evaluate the mucosal surface, such as colonoscopy. It is, therefore, important to include malignant peritoneal mesothelioma in the differential diagnosis of underlying causes of rectal prolapse.

Ethical Approval

The presented investigations and the publication of data comply with ethical rules of East Carolina University and general rules of experimentation with humans.

Declaration of Conflicting Interests

There are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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