Case Report
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Gastric Epithelioid Rhabdomyosarcoma: A Case Report

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Abstract

Epithelioid rhabdomyosarcoma is an uncommon tumor. It is found mainly in somatic soft tissues like parotid, urinary bladder, trunk, neck, and limbs. Only two cases of this tumor in gastrointestinal tract (liver and gastro esophageal junction) has been reported to date; thus, we herein reported an unusual site of this tumor in the pylorus part of the stomach. In the present paper, we studied a 67-year-old male subject with complaint of dyspepsia, belching, and reflux for about 4 years. He had also consumed herbal drugs to relieve the pain for several years. In the endoscopy procedure, there was a large tumor at the distal part of the gaster. Furthermore, excisional biopsy was performed and the histological specimens showed tumor necrosis with high mitotic cell counts, large vesicles, eosinophilic cytoplasm of epithelial cells, and round nuclei. Immunohistochemistry staining was positive for Myogenin, Desmin, MyoD1 (30% ratio), and Ki67 (70 % ratio). Computed tomography scan images showed several metastases to peritoneum and lungs. After initiating the treatment, the adverse effects of chemotherapy persuaded us to discontinue the regimen. Finally, the patient died due to pulmonary embolism. To conclude, primary epithelioid rhabdomyosarcoma is a very rare lethal cancer that may be found as gastrointestinal cancers. Hence, it requires further diagnostic investigations in order for the best treatment to be found.

Keywords: Stomach neoplasms, Rhabdomyosarcoma, Immunohistochemistry, Case report

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Introduction

Rhabdomyosarcoma (RMS) is a rare malignant cancer with a rate of 4.3 in 1 million in older adults, while being the most common soft tissue sarcoma in pediatrics.[1] It is divided into four histologic formations, namely alveolar, embryonal,

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pleomorphic, and spindle with ganglionic formation. Epithelioid rhabdomyosarcoma (ERMS) has been recently found and it is not to be yet included in World Health Organization classification.[2]

ERMS tumors have been reported in liver, mandible, maxilla, bladder urothelium, kidney, parotid gland, skin, bone, and gastroesophageal junction.[3-5] Rare occurrence of ERMS in gastrointestinal tract propelled us to report this case as a second report of this tumor in the distal part of the gaster; however, other RMS types have been previously reported in the literature.

Case Presentation

A 67-year-old male patient with complaint of stomachache referred to Hematology and Oncology Department at Ghaem Hospital of Mashhad University of Medical Sciences. His gastric pain had lasted for about 4 years, being non-positional and starting 1 hour after each meal without any radiation to the limbs. Moreover, our subject reported reflux almost throughout every day with nausea and belching. He had lost weight by about 7 kg (approximately 10%) during the last 2 years and his appetite dwindled as well. The patient just consumed herbal medicine to relieve the pain and no history of other diseases, allergy, and smoking were mentioned. Nonetheless, there was positive family history of his aunt who died of gastric adenocarcinoma at the age of about 55 because of cancer metastasis. Physical examinations were normal, except for the palpable mass below 10th left costal margin and pallor skin. Due to differential diagnosis based on these findings, for future confirmation, laboratory tests, like complete blood count, blood urine nitrogen, creatinine, blood sugar, electrolytes, erythrocyte sedimentation rate (ESR), and quantitative C reactive protein (CRP) were evaluated. The results were as follows: high ESR 1st hour>70 (reference range (rr) for the same age<30); high CRP>189.6 (reference range<5); normochromic normocytic anemia (hemoglobine11.6 (rr:12.30-17); mean corpuscular volume (MCV)=85.0 (rr: 77-96); mean corpuscular hemoglobin (MCH)=26.8 (rr: 26-36); thrombocytosis (platelets 548000); leukocytosis (12800, neutrophil 80%). Abdominal ultrasonography showed distal irregular thickening of gaster by about 13.5 mm as well as adjacent round adenopathy (17×15 mm) in the prepyloric region. Additionally, liver heterogenic necrotizing mass spread over the subhepatic area and mild ascites. Further abdominal endoscopy represented a submucosal antral mass of about 2×2 cm with ulceration and pyloric mucosal mass, with slight stenosis of pylorus; hence, biopsies were performed, revealing prominent nuclei and eosinophilic cytoplasm (Figure 1), eccentrically different size of eosinophilic nuclei, and clearly visible apoptotic bodies. In some areas, cell morphology had a markedly different size of the tumor cells and eosinophilic cytoplasm.

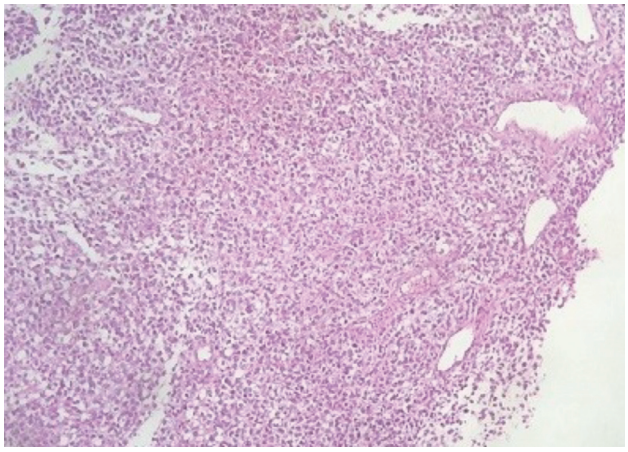

Figure 1. Microscopic section shows fibrovascular septa in Hematoxylin and eosin staining (×100).

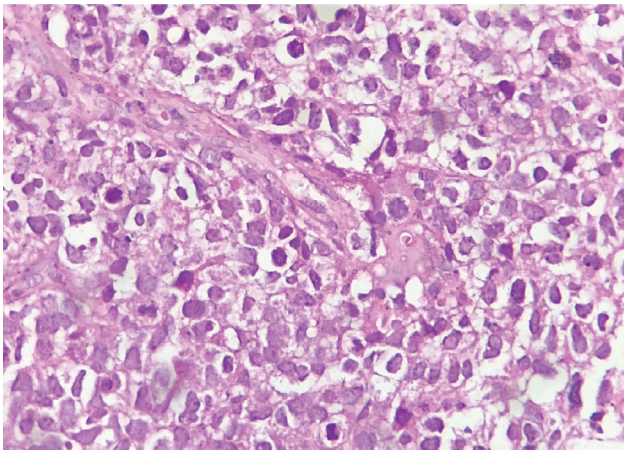

Figure 2. Histologic finding shows neoplastic proliferation of epithelioid cells with eosinophilic cells with sheet formation and high mitotic activity (Hematoxylin & eosin staining, ×100).

Additionally, there was not any patchy necrosis, but high proliferation and mitotic activity (Figure 1 and 2). Immunohistochemistry (IHC) staining was positive for Desmin, Myogenin (Figure 3 and 4), Myo D1 (With the expression being 30% positive (Figure 5)), and Ki67 (≥70% (Figure 6)). Furthermore, IHC showed negative Ck7, CK20, CDX2, CD117, DOG1, Ck, CD34, Ck pan, and epithelial membrane antigen (EMA), according to rhabdomyosarcoma diagnosis.

Abdominal computed tomography scan demonstrated pedunculated mass with size of 10×10 cm in the left lobe of liver, lobulated margin, and septal enhancement. There was also mild dilation of intrahepatic bile ducts as well as a number of focal mesenteric lesions with a maximum diameter of 16 mm and mesenteric adenopathy (Figure7 -A and B).

Subsequently, we performed the tumor resection and hepatic wedge biopsy with liver restoration surgery; the tumor size was 15×15 cm, positioned in the lateral hepatic segment. Another tumor was based in the distal part of the stomach, which were resected. The biopsy showed a fragment high-grade lesion without any background of liver tissue, atypically large nuclei cells by few cytoplasm some predominantly vacuolated without differentiation by dilated vascular channels were considered. Thoracic computed tomography scan exhibited a nodule positioned in the right lung middle lobe and granulomatosis nodule in the left lower lobe of lung with mild pleural effusion in that region (Figure 8).

Following these findings, we reached a conclusion; the exact diagnosis was ERMS. Therefore, the chemotherapy drugs after risk and grading evaluation were applied as follows: dactinomycin; vincristine and cyclophosphamide; dexamethasone; ondansetron.

Three months after the first episode of the treatment, the paresthesia of both legs were considered. Thus, due to the adverse effects of vincristine, it was discontinued. The distal phalanx of his left toe fractured 5 days after the last admission. Accordingly, the orthopedic surgery performance caused immobility and led to lower limb swelling. Enoxaparin ampules (60 mg/day) were prescribed for him. The patient declined to follow the treatment in the hospital. He even travailed in dyspnea and chest pain. Nevertheless, before the ambulance arrived, he had died.

The patient signed the informed consent. The Ethic Committee of Mashhad University of Medical Sciences approved the present research (code: IR.MUMS.REC.1401.156).

Discussion

RMSs have been frequently found in children, but in adults, it is highly lethal due to late time diagnosis. Furthermore, they have been reported

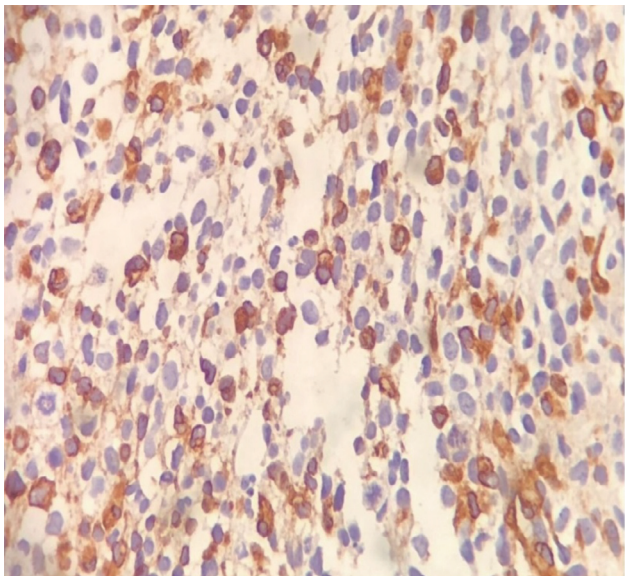

Figure 3. Microscopic specimen shows positive results for Desmin Immunohistochemistry, ×400).

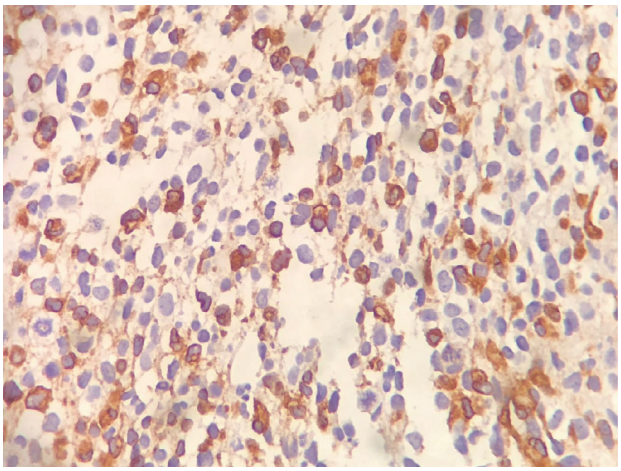

Figure 4. Microscopic section shows positive results for Myogenin (Immunohistochemistry, ×400).

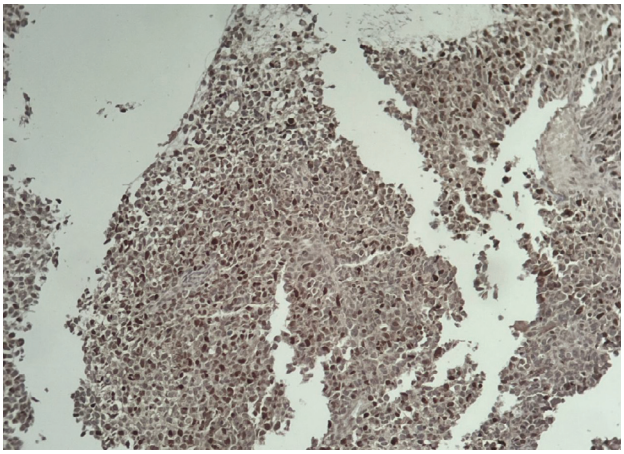

Figure 5. Immunohistochemistry stating has positive results for MyoD1 in 30% of cells (×100).

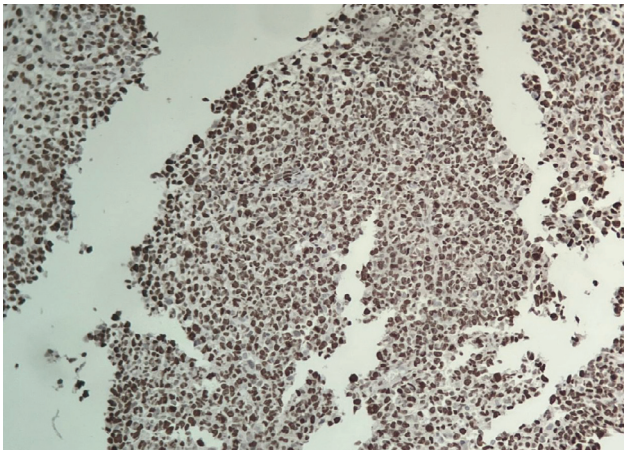

Figure 6. Positive Ki67 in 70% of cells (×100).

to metastasize to the lymph nodes, liver, lung, bone. In a previous work, men were more affected than women.[1] Histological findings also indicated small round tumor cells with hyperchromatic nuclei and abundant eosinophilic cytoplasm with a large polygonal tumor shape.[6]

Seidal et al. first discovered ERMS,[7] in a patient who had pelvic tumor. ERMS may be relevant to the most frequent type of RMS, the embryonal pattern, based on chromosomal analysis.[8, 9] The morphology is close to that of carcinoma and melanoma due to epithelial malignant characteristics in histology specimen.[10] Meanwhile, immunohistochemical findings, including Desmin, Myogenin, and MyoD1 are expressed in ERMS tumors, but Ki67 expression varied,[3,5,11] which was distinguished from differential diagnosis by IHC.

Primary ERMS of the stomach is known to be scarce. Only one case had been described before in the gastroesophageal junction with mucosal patchy necrosis feature, and different sizes of round cells that resemble lymphocytes eosinophilic cytoplasm. In addition, the histology revealed some fusiform and tad pole-shaped tumor cells. IHC staining was also positive for MyoD1, Myogenin, PGP9.5, CKpan, EMA, while being negative for CgA, S-100, HMB45, CD99, CD20, CD79a, CD30, ALK, CD117, DOG1, MUM1, FLI1, LCA, Bcl-2, TdT, and CD34 for epithelial cells. Noticeably, Ki67 is positive in 90% of cells. In another work, tumor resection surgery program was implemented, with no genome analysis for the patient, like our case.[5] The first case of hepatic ERMS just reported that IHC showed positive results for Myogenin, Desmin, Myo D1, and CD56, whereas it was negative for CDK4, in line with our results. In the aforementioned study; however, RNA sequencing was performed, which found no gene fusion.[3]

The most reliable diagnostic approach is IHC antibodies and specimen staining by hematoxylin and eosin (H&E) post operation. The most important point is differentiating ERMS from other carcinomas, like melanoma. That is because it had basophilic cytoplasm and large eosinophilic nuclei, positive HMB45, S100, and MART-1, but negative Desmin and Myogenin.[12] Some types of lymphoma cause multinucleated giant cells and macrophages. In a previous paper, the immunostainings were found positive for CD138, CD38, IRP4/MUM1, and CD79a, and negative for MyoD1, Myogenin, Desmin, as well as Actin.[13] If present, the large necrotizing field is the same neuroendocrine cancers because they are arranged in beam-like, nested, or flaky patterns. These are positive for CgA, Syn, CD56, PGP9.5, and NSE, but negative for MyoD1, Myogenin, and Desmin. Necrotic areas and high mitotic counts are the same.[14] Gastric adenocarcinomas IHC was reported positive for CKpan, CK8/18, CK19, CK20, EMA, and CEA, but negative for MyoD1, Myogenin, and Desmin, with the mitotic counts being very low.[15] Gastrointestinal stromal tumors were found in older adults at any part of the stomach with positive results for CKpan,

CK8/18, CK19, CK20, EMA, and CEA, but negative results for Myogenin and Desmin. Nonetheless, the histology may be epithelioid, like ERMS.[16] ERMS histology is known to be similar to the alveolar spaces in the lungs, where uniform polygonal cells with round hyperchromatic nucleus fill the space with the septum of fibrous connective tissue with neoplastic cells.[17] Embryonal RMS is a prevalent type of tumor in children, which mostly occurs in head and neck regions. Histological findings showed polygonal-shaped tumor cells with abundant eosinophilic cytoplasm and hyperchromatic nuclei with Desmin positive results in IHC.[18] Spindle cell rhabdomyosarcoma mostly occurs in the paratesticular region. MyoD1 expression also indicated poor prognosis in a previous study.[19] Pleomorphic RMS is believed to be the least common type of RMS, with poor outcome and survival rate. Moreover, IHC findings showed skeletal muscle-specific marker myoglobin, MyoD1, and myosin, or myf4, Desmin, MSA, SMA, and Myf4.[20]

Conclusion

Herein, we found that despite ERMS not being a common tumor, it should be considered if the patient has a history of abdominal discomfort. Undoubtedly, its management would be challenging..

Acknowledgement

We are grateful to Professor Ghodratollah Maddah for helping us manage our patient.

Informed Consent

Our patient consented to the investigation of his rare disease for medical and educational purposes.

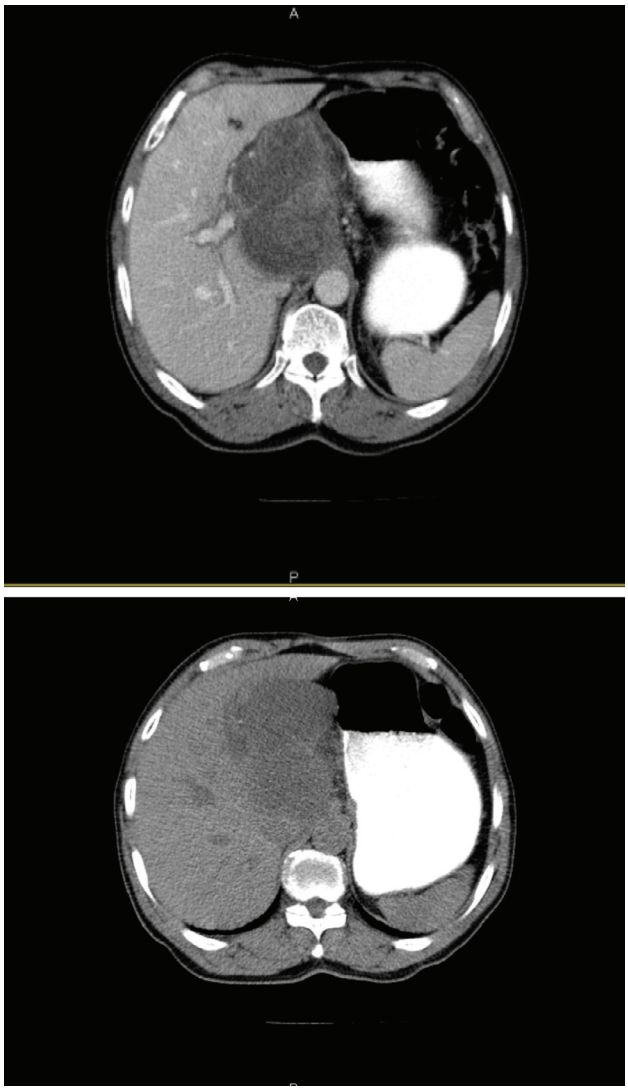

Figure 7. A. Abdominal CT-scan. Tumor site coronal sheet shows prepyloric tumor with invasion to the liver and pancreas. B. Tumor site coronal sheet shows prepyloric tumor with invasion to the liver and pancreas.
CT: Computed tomography

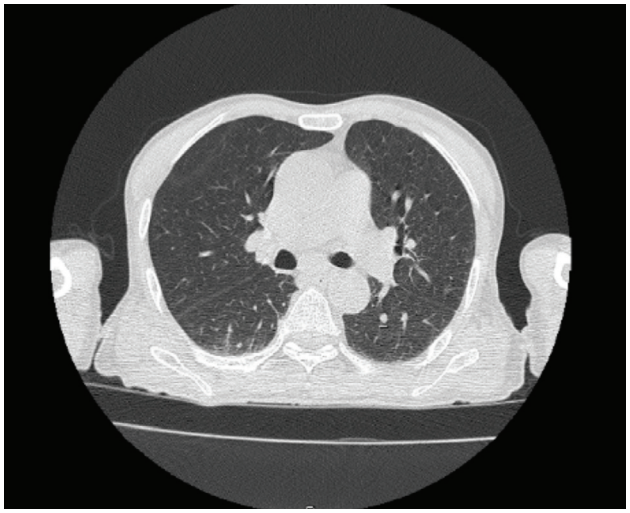

Figure 8. Lung CT-scan shows granulomatosis nodule in lower lobe of the left lung and a nodule in the right lung middle lobe with mild pleural effusion.
CT: Computed tomography

Conflict of Interest

None declared.

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