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Metastatic Gastric Adenocarcinoma Cancer With a Very High Serum Carbohydrate Antigen 19-9 Level: A Case Study

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ABSTRACT

Carbohydrate Antigen 19-9 (CA19-9) is a tumor marker for the prognosis of colorectal and pancreatic cancers. The high level of this tumor marker in gastric cancer indicates the advanced stage and peritoneal metastasis of the tumor. We reported a case of gastric cancer with an extremely high serum level of CA19-9. We also measured the serum levels of carcinoembryonic antigen and Carbohydrate Antigen 125 in the reported case. Such tumor markers manifest the progression and poor prognosis of cancer. Computed tomography data indicated several lytic and sclerotic foci in the inferior thoracic, lumbar vertebrae, and the right iliac wing, along with invasion to lymph nodes and a right adnexal mass in the reported patient. Bone marrow biopsy results revealed that carcinoma cells were predominantly composed of signet ring cell carcinoma. The patient has expired before receiving any interventions for cancer.

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Introduction

Gastric Cancer (GC) is the third most fatal cancer, with low odds of survival and decreased quality of life after surgery. Such failures exist despite advances in surgery and modern treatment interventions [1]. It has been suggested that even after the surgery, metastasis to other organs is possible [2-4]. GC is normally detected and confirmed by biopsy during endoscopy. Conventional tumor markers, including Carcinoembryonic Antigen (CEA), Carbohydrate Antigen 125 (CA125), and Carbohydrate Antigen 19-9 (CA19-9) are less valuable for early detection of GC. However, they are used in the follow-up treatment and prognosis of patients with GC [5].

CA19-9 is a mucin glycoprotein with a high molecular mass. It is a tumor marker of colorectal and pancreatic cancers. Although the CA19-9 tumor marker is highly sensitive, it has low specificity [6]. Besides, it could be found in some other organs, such as the gallbladder and biliary ducts [7, 8]. The level of CA19-9 might indicate the development of cancer; a poor prognosis of the disease could be considered when the level of this tumor marker is high [8].

Case Presentation

A 36-year-old woman was referred to the emergency department of our hospital, complaining of acute shortness of breath one day before admission. She had orthopnea but had no chest pain, cough, or fever. She mentioned no trauma. She experienced no shortness of breath and no point in her medical history was significant. She used NSAIDs to relieve the pain as required and never used OCP. She presented no history of substance dependence, cigarette smoking, or alcohol consumption. Her family history was unremarkable. She also had a history of general weakness, significant weight loss, heartburn, and chronic mild periumbilical pain that radiated to her left flank. Her vital signs were as follows: blood pressure 100/80 mmHg; pulse rate 95/min; respiratory rate 32/min; and body temperature 37.6°C. Blood oxygen saturation was equal to 78% (in room air). On physical examination, she presented pale conjunctivae and cyanotic lips.

She had tachypnea and respiratory distress and was using her accessory muscles to breathe. The lung sounds were decreased in the explored patient. On abdominal examination, she had tenderness on the epigastric and umbilical region without any rebound tenderness or rigidity. No mass was revealed in her examinations. Laboratory findings indicated anemia with a drop of hemoglobin level to 7 gr/dL and a red blood count of 2.36/uL, as well as thrombocytopenia with a low platelet count of 8000/µL. The count of white blood cells was equal to 12800/mm^3. Slightly elevated liver enzymes were also observed in the patient.

Alkaline phosphatase increased to 2100U/L with normal gamma-glutamyl transferase. Lactate dehydrogenase was measured as 1027U. Prothrombin time was observed to be 16.3 s with a low fibrinogen level at 142 mg/dL. Chest X-ray was normal in the patient. Echocardiography revealed a mild pericardial effusion. The Computer Tomography (CT) scans of the abdominal and pelvis revealed several abnormal lytic and sclerotic foci in the inferior thoracic, lumbar vertebrae, right iliac wing; along with swollen para-aortic and aortocaval lymph nodes of 10 mm in size. Besides, a few swollen lymph nodes were observed around the antrum of the stomach with complex right adnexal mass (Figure 1). Bone marrow biopsy data indicated bone tissue replaced by the sheets and clusters of neoplastic epithelial cells with signet-ring features (Figure 2).

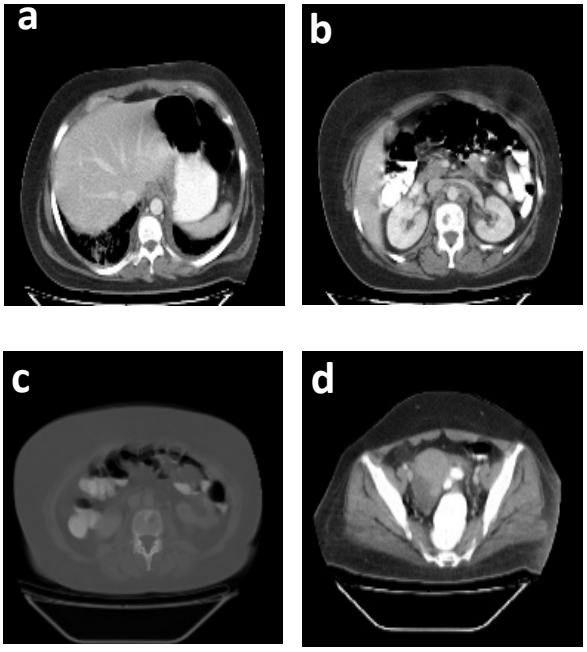

Figure 1. The CT scan of the abdomen

A & B: The scans show a few para aortae and aortocaval lymph nodes with a 10 mm size and a few lymph nodes around the antrum of the stomach; C: Shows the complex right adnexal mass in the CT scan; D: Illustrates the lytic and sclerotic foci in vertebrae which revealed bone metastasis.

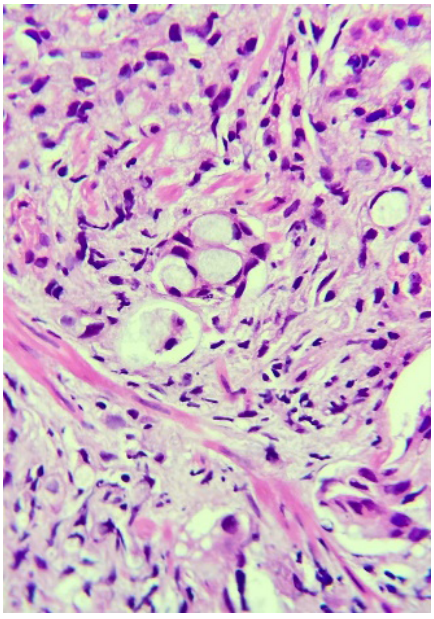

Figure 2. Bone marrow biopsy

An amplified and explicit mucin-filled cytoplasm; it made the nuclei to be abnormally compressed and shifted to the corner, i.e. called a signet-ring feature.

Upper gastrointestinal endoscopy revealed erosive gastropathy with a suspicious infiltrative lesion at cardia. The biopsy was conducted and pathology results confirmed Signet ring cell carcinoma. CEA and CA-125 serum levels were equal to 18.2 ng/mL and 560 U/mL, respectively. Furthermore, the serum level of CA 19-9 was extremely high at 17000 U/mL. Alpha-Fetoprotein (AFP) level was calculated as 11 IU/mL. The standard cut-off levels of 3.5 ng/mL CEA; 35 ng/mL CA125; 37 ng/mL CA19-9, and 9 IU/mL AFP were used in this study. However, the patient expired three days after admission due to cardiac arrest before receiving any cancer treatment.

Discussion

The presented case had a metastatic carcinoma that originated from the stomach, according to signet-ring features and clinical indications. CA19-9 is a prognostic tumor marker that helps to determine cancer progression. Based on a study, 42% of patients with GC (especially in the fourth stage) had high levels of CA19-9. It is used in the evaluation of treatment, relapsing, and prognosis. This tumor marker highly rises in the presence of micrometastasis to lymph nodes and unlimited peritoneal involvement type [6, 9]. This increase tends to occur greater in females than males. GC prognosis depends on tumor size; the differentiation status of tumor cells; the depth of invasion, lymph node metastasis, and vascular involvement [10]. Additionally, tumor markers, such as CEA, CA19–9, and AFP have prognostic value for GC; in other words, the positive rate of these tumor markers increases with tumor stage [2, 10]. Considerably, longer progression-free survival in patients with reduced CA19-9 is expected after chemotherapy [11]. The high mortality rate in GC is attributed to early metastasis [2].

Our patient had an exceptionally high serum level of CA19-9 at 17000U/mL and GC with metastasis to bone, lymph nodes, and right adnexa. Other tumor markers, such as CA125 and CEA were also elevated. The high level of CA19-9, i.e. rarely observed in GC, has probably increased in this patient due to metastasis and lymph node involvement. The positivity of these three tumor markers indicates advanced stage and poor prognosis; however, applying these tumor markers in patient's follow-up management remains controversial [9].

Conclusion

The serum level of CA19-9 in the reported patient was over 17000 U/mL. This extremely high level of CA19-9 is rare in patients with GC. High levels of CA19-9 must be considered in patients, as it is associated with a poor prognosis.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed of the purpose of the research and its implementation stages. An informed consent form was obtained from the patient.

Funding

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Conflict of interest

The authors declared no conflict of interest.

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