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A Case of Obstructive Colitis with Elevated Serum Carcinoembryonic Antigen

Hitoshi Kameyama*, Masayuki Nagahashi, Yuki Hirose, Natsuru Sudo, Yosuke Tajima, Masato Nakano, Yoshifumi Shimada, Takashi Kobayashi, Shin-ichi Kosugi and Toshifumi Wakai

Niigata University, Niigata city, Japan

Abstract

We report the case of a 72-year-old female who was admitted to our hospital because of obstructive colitis. Blood analysis showed her serum carcinoembryonic antigen (CEA) level to be 156.0 ng/mL. A sigmoidectomy and descending colostomy were performed for obstructive colitis due to colonic diverticulitis. Histopathological examination revealed active inflammation of the sigmoid colon without neoplasia. Her serum CEA level decreased within normal limits immediately after surgery.

Keywords: Carcinoembryonic antigen (CEA); Obstructive colitis; Diverticulitis; Colectomy

Introduction

The cell surface glycoprotein Carcinoembryonic Antigen (CEA) is commonly used as a tumor marker for various malignancies [1]. However, serum CEA levels sometimes increase secondary to benign diseases or conditions, including inflammatory bowel disease (IBD), liver disease, pancreatitis, and smoking [2]. Therefore, differential diagnosis with high serum CEA levels includes both benign and malignant disease.

Case Presentation

A 72-year-old female was admitted to our hospital because of abdominal pain. The physical examination showed a distended tympanic abdomen and tenderness in the left abdominal quadrant. Her medical history included hypertension and Alzheimer's disease. She was 149.0 cm in height, weighed 42.8 kg, and did not smoke cigarettes. Her body temperature was 37.8°C, blood pressure was 160/80 mmHg, and pulse was 110 bpm with regular rhythm. Blood analysis showed a white blood cell count of 7,470 cells/mm3 and C-reactive protein level of 34.1 mg/dL. The level of her serum hemoglobin was 10.7 g/dL, blood urea nitrogen was 36.0 mg/dL, and creatinine was 1.1 mg/dL. Her serum CEA level was 156.0 ng/mL (normal value, < 5.0 ng/mL). An abdominal X-ray showed dilation of the large-bowel segment. An abdominopelvic Computed Tomography (CT) scan revealed a markedly dilated sigmoid colon with multiple colonic diverticula however, no malignant findings (Figure 1).

Obstructive colitis due to colonic diverticulitis was diagnosed and a sigmoidectomy and descending colostomy were performed. Histopathological examination revealed colonic diverticulitis without neoplasia. Her postoperative course was uneventful, and her serum CEA level decreased to within normal limits on postoperative day 18. On postoperative day 19, she was transferred to a psychiatric ward for the treatment of the Alzheimer's disease. Her serum CEA level has remained within normal limits since discharge.

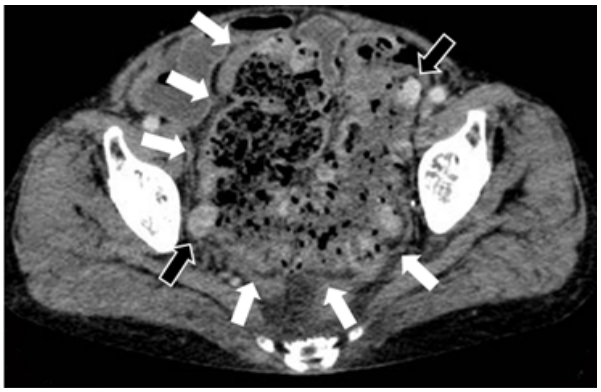

Figure 1: An abdominopelvic CT scan revealed a dilated sigmoid colon (white arrows) with multiple colonic diverticula (black arrows).

Case Discussion

CEA was first detected by Gold et al in 1965 [3,4]. It is a highly glycosylated protein with a molecular weight of approximately 180,000 [1]. In healthy individuals, CEA is produced in the colorectal mucosa, and then released into the gut lumen where it disappears immediately. CEA is well-known as a tumor marker for various malignancies. In colorectal cancer, the neoplastic cells located deep inside tumor glands become unpolarized and express CEA on their entire cell surface. As a result, exfoliated CEA can enter blood and lymphatic vessels through the intercellular spaces [5].

Serum CEA levels also increase in benign diseases or conditions, including IBD, liver cirrhosis, hepatitis, pancreatitis, and smoking [2]. Gardner et al. reported that in patients with ulcerative colitis (UC), 24% of mild relapses and 86% of severe relapses were accompanied by elevated CEA titers [6]. In UC, serum CEA concentrations increase because of the up-regulation of colonic epithelial CEA expression secondary to active mucosal inflammation.

CEA expression is normally localized to the apical epithelial surface only in healthy subjects. However, during active UC, both the cytosolic and apical surfaces of the inflamed epithelial tissue stain positive for CEA [7]. In our case, immunohistochemistry showed CEA expression at both the cytosolic and apical surfaces of the inflamed epithelial tissue (Figure 2). Yamaguchi et al. [7] reported that in UC, CEA release from inflamed epithelia into the bloodstream could increase serum CEA

***Corresponding author:** Hitoshi Kameyama, Niigata University, Niigata city, Japan, Tel: +81 25-223-6161; E-mail: kame@med.niigata-u.ac.jp

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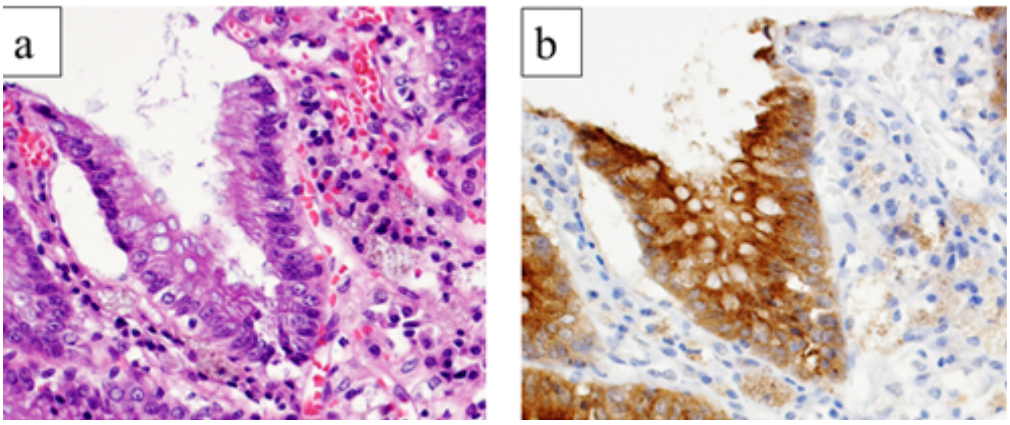

Figure 2 a: Microscopy (HE stain) showed inflamed colonic epithelia. **b:** Immunohistochemistry showed CEA expression at both the cytosolic and apical surface of colonic epithelia.

levels [7]. In our case, serum CEA levels decreased to within normal limits immediately after colectomy. We speculate that serum CEA elevation may have resulted from active colorectal inflammation.

Conclusion

We report the case of obstructive colitis with an elevated serum CEA concentration. CEA release from inflamed colonic epithelia into the bloodstream may have caused this increase. We must remember that elevated serum CEA levels are sometimes caused by benign colorectal disease involving active inflammation.

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