

Elevated CEA Levels in Non-smoker & Non-malignant Condition

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Abstract

Carcinoembryonic Antigen [CEA] is a non-specific tumor marker often found in the blood serum. High levels of CEA are commonly associated with the progression of wide range of tumors. It is currently used as a biomarker for malignant tumors of the lung and colon, but due to its limited specificity and clinical implication, it can be used only for monitoring rather than tumor diagnosis.¹ Certain non-malignant conditions like diabetes mellitus and gastric disease may also affect the CEA levels. These may be relevant particularly in early stages of colorectal cancers. Hence, elucidating the factors that affect the CEA levels might improve the accuracy and utility of its measurement.

Keywords: Carcinoembryonic Antigen [CEA], Colorectal Cancer [CRC], Gastroduodenitis.

INTRODUCTION

Carcinoembryonic Antigen [CEA] was first detected by Freedman and Gold in colon cancer cells, but later they were also detected in the epithelial cells of stomach, cervix, prostate, tongue, and esophagus.² CEA is associated with various malignant as well as non-malignant conditions. Hence, elevated CEA may not be a definitive marker for particular site of cancer origin.³

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CASE PRESENTATION

A 56-year-old presented with epigastric burning sensation and occasional abdominal pain along with mild constipation. He is a non-smoker, vegetarian with recent onset of diabetes but no history of hypertension or other chronic diseases. He had undergone Functional Endoscopic Sinus Surgery [FESS] in 2010. He was suggested by the gastroenterologist to undergo few laboratory tests as routine screening which was done in July 2022.

Investigations

CEA (9.78 ng/mL) and IgE Total Antibody (1300 CIU/mL) levels were raised with HbA1c in the diabetic range. The elevated CEA levels was a bit alarming as CEA is a commonly used tumor marker for CRC. Radiological investigations including whole body PET Scan (Figure 1) were done.

PETCT Findings Showed

- Areas of mucus plugging in both lungs-of inflammatory/infectious etiology.
- Under distension versus subtle thickening of the lower rectum.

Recommended clinical and endoscopy correlation indicated few inflammatory findings in both lungs & mild thickening of lower rectum, but ruled out the possibility of malignancy.

Since there were repeated symptoms of acute gastritis for which patient was being treated, gastrointestinal endoscopy was also suggested.

Findings were mild gastroduodenitis & small hiatus hernia. (Figure2).

Colonoscopy was also done & finding was normal ileo-colonic mucosa.

DISCUSSION

As described by C. Huang et al serum Carcinoembryonic antigen, a widely used tumour marker, is a large heterogenous cell surface glycoprotein which is involved in apoptosis, immunity & cell adhesion. Gross glycosylation

differences between normal and tumour tissues, is characteristic of CEA marker.¹ As described by Ozgur Turk et al CEA levels are increased in cancer of the colon, rectum, lung, breast, liver, pancreas, stomach & ovary.⁴ C. Huang et al further observed that CEA measurement is limited in its utility for the surveillance of malignancy recurrence, especially for CRC.¹ Iwasaki Y et al also mention that lesser elevations of CEA occur in benign liver disease (hepatitis, cirrhosis), alcoholic cirrhosis, emphysema, diabetes mellitus, benign gastric & intestinal disease (polyposis, ulcerative colitis), benign breast disease, pulmonary infection, emphysema & renal failure.⁵ De Vries AC et al suggested that CEA measurement is being increasingly performed to complement other cancer diagnostic modules such as colonoscopy, the stool occult blood test, or low-dose chest CT scan.^{4,5}

In the present case, clinical biochemistry tests, PET Scan, GI Endoscopy & Colonoscopy had clearly ruled out the possibility of differential diagnosis supporting any associated tumors. Mild diabetes, lung inflammation, thickening of lower rectum & mild gastroduodenitis are suggestive of possible nonmalignant conditions associated with elevated CEA levels.

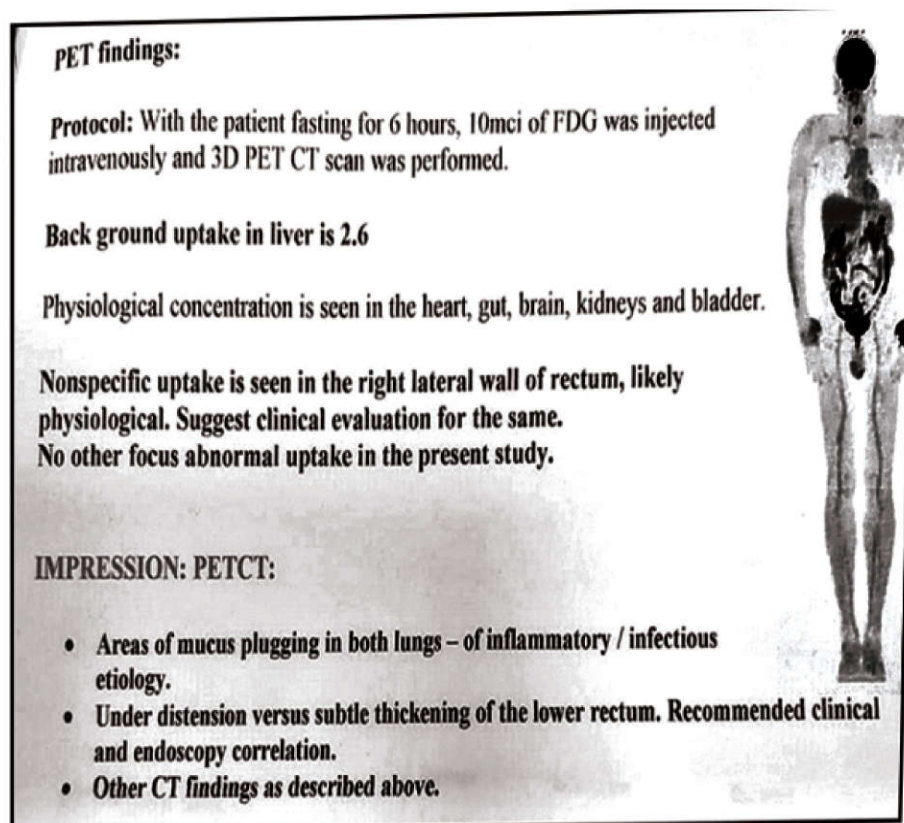


Figure 1: PETCT

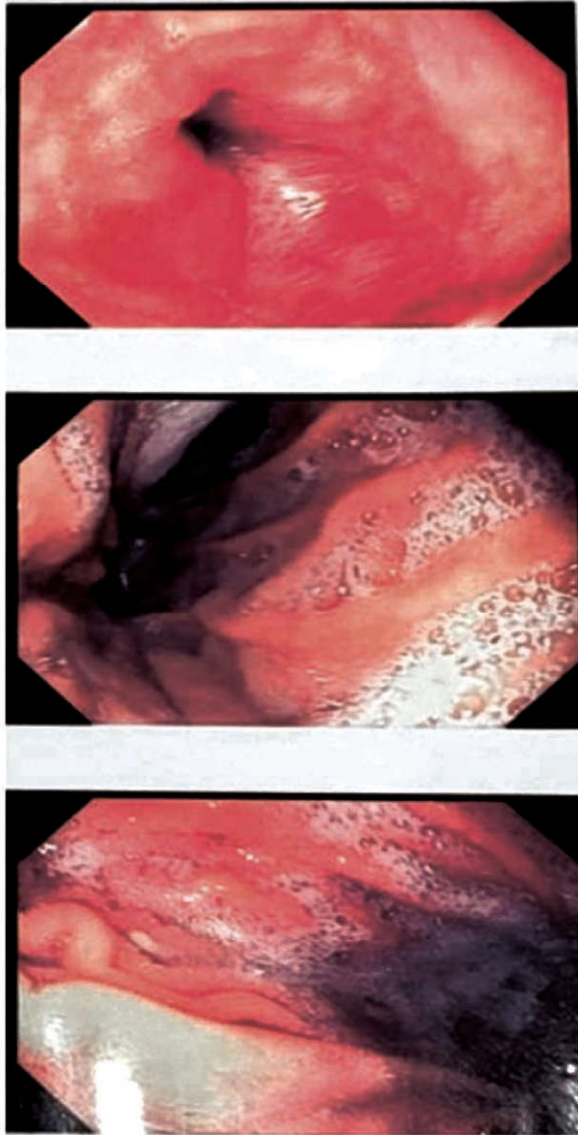


Figure 2: GI Endoscopic

CONCLUSION

CEA should not be used for screening or early detection of malignant disease because of its low sensitivity and specificity for malignancy, particularly for early stages of CRC. Serum CEA levels vary among the healthy population, and the factors that affect it have not been fully elucidated. Hence, in this case we could conclude that the elevated CEA might be due to non-malignant

conditions like diabetes mellitus & gastric disease, but constant follow up with gastroenterologist was suggested. One should remember that CEA level can be misinterpreted under certain circumstances. Thus, elucidating the factors that affect the CEA level might improve the accuracy and utility of its measurement.

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