Abstract
We report the case of a 42 year male with history of chronic anaemia who was found to have pernicious anaemia with beta thalassemia trait and had on esophago-gastric-duodenoscopy, gastric carcinoids with gastric atrophy. Pernicious anaemia and gastric carcinoids occurring simultaneously in a single individual is rare. Our case emphasises the need for esophago-gastric-duodenoscopy in cases of pernicious anaemia.

Introduction
Both pernicious anaemia and gastric carcinoids occurring simultaneously in a single individual is rare. Our case is probably the first one from India.

Case Report
A 42 year male presented with progressive symptoms of fatigue of 6 months duration. He gave no history of any other symptom including hematemesis or melena. His past history was significant for severe anaemia (Hb-2.9) 5 yrs ago for which he had received blood transfusions. In the intervening period he was apparently well. Six months before admission he was operated for deep vein thrombosis (details were not available). Physical examination and systemic examination was unremarkable except for pallor.

Laboratory investigations showed the following: haemoglobin – 4.6 gm/dl (13-16 gm/dl), white blood cells– 6,500/µL (4000-11000/µL), platelet count – 172,000/µL (150,000-400,000/µL), serum ferritin– 234.67 ng/ml (12-176 µg/L), total iron binding capacity– 250.3 ug/dl (240-450 µg/dL), unsaturated iron binding capacity– 113.7 ug/dl (150-375 µg/dl), vitamin B12- 63.27 pg/dl (200-900 pg/dl), serum folate – 15.49 ng/dl (3.6-20 ng/dl).

Peripheral smear (Figure 1) showed marked anisopoikilocytosis with admixture of microcytic hypochromic red cells, macrocytes including macroovalocytes and hypersegmented polymorphs. He underwent esophago-gastric-duodenoscopy for cause of anaemia which showed multiple tiny nodules (~5 mm) with summit erosions suggestive of gastric carcinoids (Figure 2). Gastric mucosa was also remarkable for prominent sub-epithelial vessels suggestive of gastric atrophy (Figure 3). Endoscopic gastric nodule biopsies obtained showed enterochromaffin-like cell hyperplasia which was positive for chromogranin and synaptophysin (Figures 4 and 5) thereby confirming gastric carcinoids or neuroendocrine tumour.

He underwent further investigations including anti parietal cell antibody and anti-intrinsic factor antibody which were both positive. Serum chromogranin A levels were 227.5 mg/ml (36.4 µg/L). Serum gastrin level was 1597 pg/ml (0-200 pg/ml). Intrinsic Factor Blocking Antibody (IFBA) was 15.3 (equivocal). Haemoglobin electrophoresis was suggestive of beta thalassemia Trait and HbA2 was 5.6% (1.5-3.1%).

A diagnosis of severe vitamin B12 deficiency secondary to pernicious anaemia with atrophic gastritis and gastric carcinoid was made. He was treated with daily injection of methylcobalamin 1 mg intramuscular for a week followed by weekly injection for a month and then monthly injection.

Discussion
Pernicious anaemia1 is a rare autoimmune disorder which is common in African or European population2 but rare in the Indian population. There is no clear data available regarding the incidence of pernicious anaemia in Indian population although it is 354 per 1,00,000 population in Southwestern American Indians.3 It is known that patients with pernicious anaemia have a higher risk to develop gastrointestinal malignancies such as gastric adenocarcinoma, carcinoid tumours, or oesophageal squamous cell carcinoma.4 Our case was one such, with concomitant pernicious anaemia and gastric carcinoids.

As the gastric nodules were small (~5mm) endoscopic resection was not recommended. Instead regular surveillance was planned. Our patient also appeared to have type 1 gastric carcinoid which is characterized by the triad of hypergastrinemia, the presence of anti-parietal cell antibodies and macrocytic anaemia. The other two types are as follows: type II develops in patients with combined Multiple Endocrine Neoplasia type 1 and the Zollinger–Ellison syndrome, and type III is sporadic.5 The incidence of metastases is less than 5%.6 Another concern is the development of concomitant gastric adenocarcinoma, which was reported to occur in up to 6% of patients with type 1 gastric carcinoid tumours.7 Therefore regular annual endoscopic examination was recommended to our patient. The American Society for Gastrointestinal Endoscopy recommends a single endoscopic evaluation at the diagnosis of pernicious anaemia.8 This is largely to confirm gastritis and rule out gastric carcinoid and other gastric cancers, since patients with pernicious anaemia are at increased risk for such cancers and to ensure that no single lesion is enlarging. Gastric resection is recommended for any large lesions >1.5 to 2 cm or lesions that have deeply penetrated the stomach wall into the submucosa or muscularis.9 Antrectomy which leads to the disappearance of hyperplastic G-cells, is sufficient to reduce circulating gastrin to a level
that does not promote significant ECL cell hyperplasia, thus leading to carcinoid regression and inhibiting additional carcinoid formation.\textsuperscript{10,11} If carcinoid tumours do not regress after an antrectomy, additional monitoring is necessary and a total gastrectomy should be considered. Co-incidentally our patient had thalassemia trait along with pernicious anaemia.

In our case response to administered vitamin B12 was satisfactory and without further blood transfusion his haemoglobin rose to 12.3 gm/dl. Given the discrete nature of the gastric nodules, an endoscopic submucosal resection may be considered if the sizes increase to >1.5 or 2 cm.

**Conclusion**

We emphasise the need for screening upper GI endoscopy in all patients of pernicious anaemia to rule out underlying gastric pathology.

**References**