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Duodenal Pseudomelanosis: A Rare Incidental Endoscopic Finding of Undetermined Significance

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Duodenal Pseudomelanosis (DP) is an extremely rare endoscopic finding which has been linked uncertainly to a spectra of disorders. It is characterised endoscopically by presence of speckled hyperpigmentation of duodenal and proximal jejunal mucosa. The underlying histology of the involved regions show pigment laden macrophages in the lamina propria of intestinal villi. The condition has been linked to hypertension, chronic kidney disease, heart failure, gastrointestinal bleeding, anemia, oral intake of iron supplements and sulphur containing diuretics, eosinophilic enteritis and some rare cases of gastrointestinal malignancies. The exact etiopathogenesis of DP remains unknown and so are its clinical implications and significance. In the near feature as more cases of this rare entity are acknowledged, its noteworthiness might get discovered.

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Keywords: Duodenal Pseudomelanosis; hyperpigmentation; chronic kidney disease.

1. INTRODUCTION

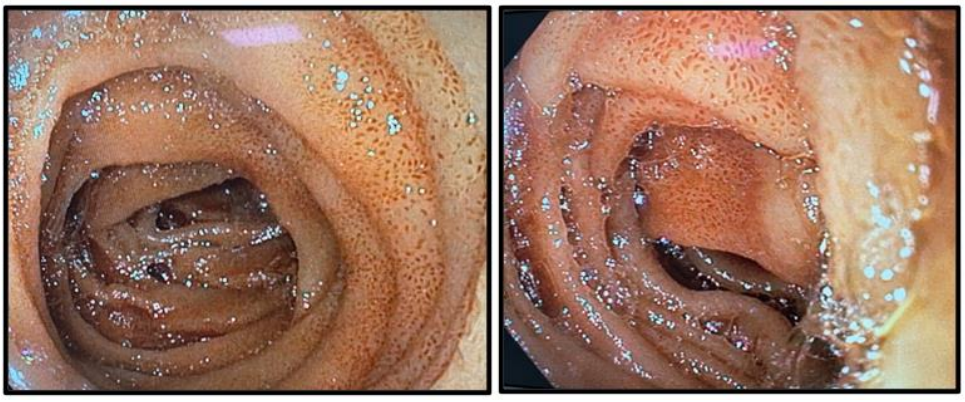
Duodenal Pseudomelanosis (DP) (also known as *Pseudomelanosis duodeni*) is a rare endoscopic finding characterised by pigmentation limited to the apex of the intestinal villi and requires histological confirmation. The exact etiology and clinical relevance of these findings is unknown but has been thought to be a result of deposition of iron and related substances in macrophages present in lamina propria.

2. CASE PRESENTATION

We report a case of 43 year old female with background history of hypertension and chronic kidney disease (not on renal replacement therapy) for a duration of around one year. The patient was currently on antihypertensives (calcium channel blocker and non-selective betablocker) and sodium bicarbonate tablets. She presented in outpatient department with abdominal pain, anorexia and malaise for a duration of around 2 months. Pain was mild dull aching, epigastric in location and intermittent in pattern; it was not associated with nausea, vomiting or diarrhea. On physical examination she had pallor and abdomen was soft, non-tender without any organomegaly. Laboratory findings revealed haemoglobin of 9.8 gm/dl with haematocrit of 30%. Her total leukocyte count was 8200 cells/mm^3 and platelet count was 1.69 lac cells/mm^3. Renal function tests revealed an elevated serum creatinine of 2.4 mg/dL and serum urea of 75.3 mg/dL. Her liver function tests were normal. Blood picture showed microcytic hypochromic red blood cells with anisocytosis and few pencil cells favouring an iron deficiency profile. Ultrasound abdomen revealed attenuated of corticomedullary differentiation and decreased renal size typical for a patient with chronic kidney disease. Esophagogastroduodenoscopy (EGD) was done which revealed presence of antral gastritis (Rapid Urease Test – Negative) & diffuse, punctate-pattern, speckled hyperpigmentation was found in the duodenum and proximal jejunum. Biopsies were taken which revealed mild chronic non-specific inflammation in lamina propria with many pigment laden macrophages in lamina which were positive for iron stain. Duodenal villi were unremarkable. The patient was prescribed oral iron and proton pump inhibitors. Also, the patient was referred back to nephrology for initiation of renal replacement therapy if deemed necessary. The patient on follow up visits reported resolution of abdominal pain symptoms, improved hemogram picture with persistent renal dysfunction. A repeat EGD wasn't done.

3. DISCUSSION

Melanosis is portrayed as an increased pigmentation of any part of body because of aggravation in melanin deposits. The term "pseudomelanosis" refers to pigmentation that may resemble melanin deposition but with the demonstration of a different type of underlying pigment. Mostly duodenal pseudomelanosis is related with hypertension, trailed by renal diseases, diabetes, iron inadequacy, gastrointestinal bleeding and utilization of sulphur containing diuretics [1-3]. It has been suggested that iron supplementation adds to the pathogenesis of DP, however numerous



Figs. 1 and 2. Diffuse, punctate-pattern, speckled hyperpigmentation was found in the duodenum and proximal jejunum

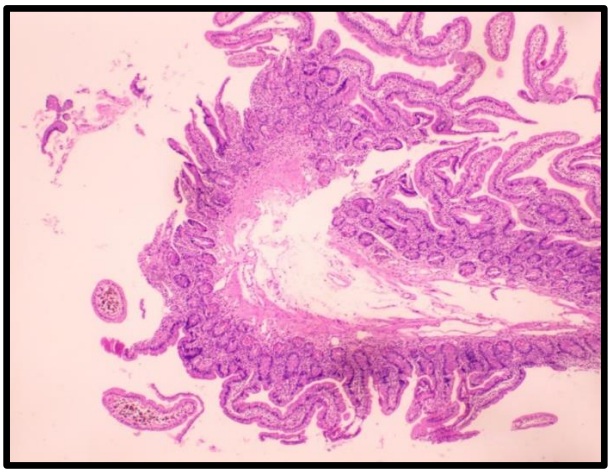


Fig. 3. Mild chronic non-specific inflammation in lamina propria with many pigment laden macrophages in lamina which were positive for iron stain

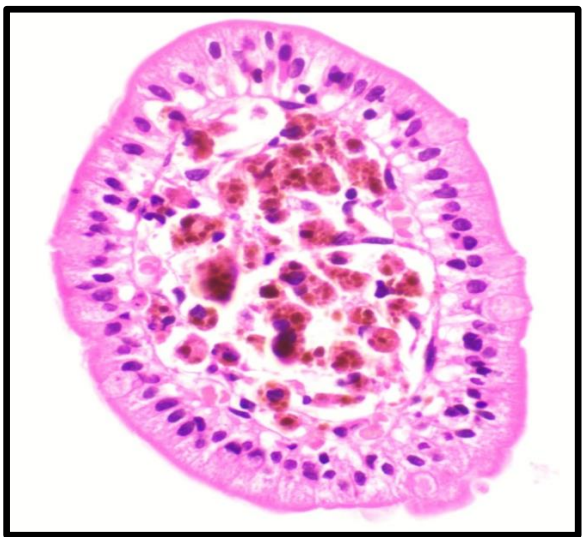


Fig. 4. Multiple foci of a brown-black granular pigment inside macrophage

studies [4] have shown that it isn't adequate as a solitary element to instigate duodenal pigmentation. The exchange among iron and sulphur might be significant in this situation. Dialysis has been connected with amassing of lanthanum in the gastrointestinal mucosa [5]. It is conceivable that the admission of sulphur or potentially iron, contained in medication brings about restricted collection in the site of assimilation in the setting of a debilitation of renal capability. Notably, hypertension is a risk factor for both heart and renal diseases, which may be managed by sulphur containing diuretics; therefore, there is an indirect link between increased sulphur intake and impaired clearance. Microhemorrhagic events have also been theorized to be involved in the pathogenesis of duodenal pseudomelanosis. It has been hypothesized that macrophages in the gastric lamina propria could be exposed to pigments via an iron-pill-induced mucosal injury which was also reported in the duodenum [6].

In our patient a plausible association between presence of DP and anemia-chronic kidney disease can be ascertained but in many cases the causality is questionable [7].

4. CONCLUSION

Our knowledge of Duodenal pseudomelanosis comes from meagre of published case reports. As per them DP represents a benign incidental finding caused by pigment deposition (mainly

iron) at the apex of duodenal villi and is associated with certain medical conditions (hypertension, diabetes mellitus, chronic renal disease) and related therapies (oral iron [8,9] and sulphur-containing diuretics [10]. Various plausible theories have been given to explain its occurrence but it remains unexplained both in terms of pathogenesis and possible clinical significance if any. The condition is mostly benign and doesn't requires any additional investigation or follow up.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

All authors declare that written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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