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**Prednisolone induced pneumatosis coli and pneumoperitoneum**

Prednisolone induced pneumatosis coli and pneumoperitoneum

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## **Abstract**

Pneumatosis intestinalis (PI) is defined as the presence of gas within the submucosal or subserosal layer of the gastrointestinal tract. It is a radiologic sign suspicious for bowel ischemia, hence non-viable bowel must be ruled out in patients with PI. However, up to 15% of cases with PI are not associated with bowel ischemia or acute abdomen. We described an asymptomatic patient with prednisolone-induced PI and modified the Naranjo score to aid in a surgeon's decision-making for emergency laparotomy *vs* non-operative management with serial assessment in patients who are immunocompromised due to long-term steroid use.

**Key Words:** Benign pneumatosis; Pneumatosis coli; Pneumoperitoneum; Letter

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**Core Tip:** We described an asymptomatic patient with prednisolone-induced PI and modified the Naranjo score to aid in a surgeon's decision-making for emergency laparotomy *vs* non-operative management with serial assessment in patients who are immunocompromised due to long-term steroid use.

## **TO THE EDITOR**

We read with interest the report by Azzaroli F et.al. <sup>[1]</sup>, who conservatively managed two patients with benign pneumatosis intestinalis (PI). We would like to share a similar clinical case with prednisolone-induced pneumatosis coli and propose a modified Naranjo score for prednisolone-induced pneumatosis.

A 71-year-old lady with dysphagia and diplopia symptoms was diagnosed with Neuromyelitis Optica (NMO). Treatment with prednisolone 20mg once daily improved her diplopia. Nasogastric tube (NGT) feeding was commenced due to malnourishment

from dysphagia. The chest radiograph for NGT placement showed pneumoperitoneum, and she was referred urgently to the surgical unit. She was asymptomatic, afebrile with normal hemodynamics. Abdomen was soft and non-tender. Leukocyte count, procalcitonin, lactate, and arterial blood gas were normal. A Computed Tomography of Abdomen and Pelvis (CTAP) with intravenous and NGT contrast confirmed pneumoperitoneum and pneumatosis coli from cecum to splenic flexure. (Figure 1). There was no contrast extravasation, portal venous gas, inflammatory pathology, or mesenteric ischemia. Non-operative management with nil enteral feeding, serial abdominal examination, serum tests, and abdominal radiographs (AXR) was done. The patient remained asymptomatic with normal serum tests. A repeat CTAP showed minimal improvement of pneumoperitoneum. A follow-up AXR two weeks later showed worsening of pneumatosis coli. Hyperbaric oxygen therapy (HBOT) was arranged. Five HBOT sessions were performed at 2.2 atmospheric pressure for 90 minutes. Her abdominal girth reduced from 79 to 73cm with minimal AXR improvement. Prednisolone was weaned over next five days and she was discharged well on oral diet. At two-weeks outpatient follow-up, AXR showed improvement (Figure 1).

Corticosteroid therapy remains the cornerstone for the treatment of autoimmune diseases. The true incidence of benign PI as an ADR secondary to corticosteroids is unknown [2]. The hypothesis is due to atrophy of lymphoid follicles in the bowel wall. Although PI occurred after prednisolone's commencement in our patient, we did not initially stop prednisolone in balancing risk *vs* benefits for NMO therapy. When PI worsened, HBOT was offered due to concerns for secondary bowel ischemia from PI. The HBOT regimen was similar to that described by Feuerstein *et al* [3], who suggested at least three sessions. As our patient's PI improved but did not resolve fully after 5 HBOT sessions, we reduced prednisolone dose. After two weeks of cessation, PI resolved, similar to a report described by Choi *et al* [4].

According to the Naranjo score (adverse drug reaction probability scale) of 6, PI was probably caused by prednisolone in our patient. Naranjo score recommends isolation of drug in toxic concentrations in body fluid, response to placebo administration, and drug rechallenge to evaluate for the occurrence of symptoms. These three criteria are not routinely done due to practical and safety reasons [5]. We propose a modified Naranjo score (Table 1) for prednisolone-induced pneumatosis which replaces these three criteria with the following: 1) No symptoms or signs of abdominal pathology, 2) Serum investigations for inflammatory markers (e.g., C-reactive protein and procalcitonin) must be normal, 3) Imaging studies should rule out hollow viscus perforation or inflammatory abdominal pathology as a cause for PI. With the modified Naranjo score, the causal link of PI due to prednisolone becomes definite. We propose validation of modified Naranjo score.

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