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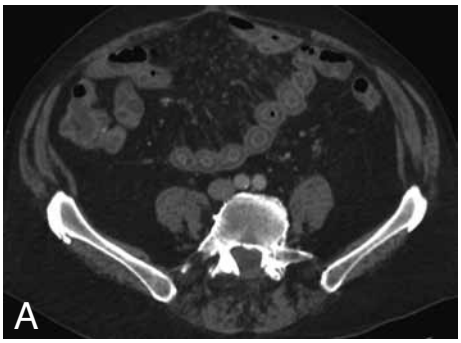
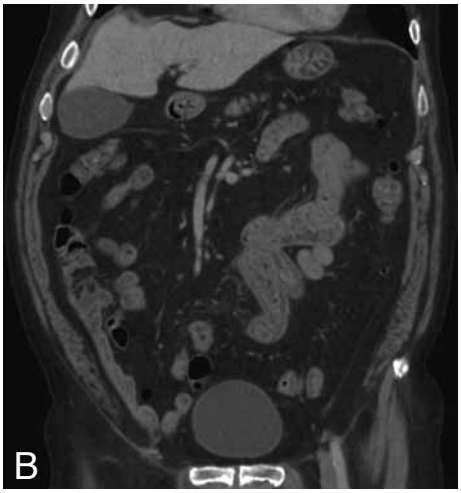
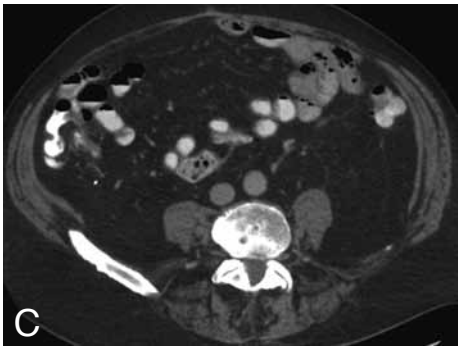
IMAGES IN CLINICAL RADIOLOGY







Angioedema of the small bowel caused by angiotensin converting enzyme inhibitor

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A 69-year-old male with a previous history of atrial fibrillation and hypertension was admitted to the emergency department because of acute onset of abdominal pain, accompanied by distension, nausea and diarrhea. Physical examination was unremarkable except for diffuse abdominal tenderness on palpation without rebound or guarding. Normoactive bowel sounds were noted. Routine blood analysis showed elevated C-reactive protein 12.8 mg/dl (normal values 0.1-1.0) and INR of 3.1 (normal values 0.9-1.2 – therapeutic values 2.0-3.0). Patient was treated for atrial fibrillation with anticoagulation therapy. Hypertension was treated with beta-blocker and angiotensin-converting enzyme inhibitor Lisinopril Sandoz[R] for 10 days.

Plain film of the abdomen demonstrated slightly dilated small bowel loops with air-fluid levels. CT scan of the abdomen after Iodinated contrast injection showed segmental small bowel wall thickening resulting in a stacked-coin appearance (Fig. A, B). Thickening of the small-bowel wall and mucosa was characterized by increased contrast enhancement and depiction of more layers of the small-bowel wall than normal. A striking contrast between the edematous submucosa of low attenuation separating the outer muscular layers and serosa from brightly enhancing thickened mucosa was noted. Some fluid accumulation within the small-bowel loops and prominent mesenteric vessels were also present. There was no ascites.

Angiotensin-converting enzyme inhibitor therapy for hypertension was discontinued at the time of admission and abdominal complaints subsided within the next two days. The patient was discharged in good general condition and remained free of abdominal symptoms since the moment angiotensin-converting enzyme inhibitor was discontinued. Repeated CT scan of the abdomen seven days later demonstrated complete resolution of abnormalities (Fig. C).

Angiotensin-converting enzyme inhibitors are drugs used to treat hypertension and congestive heart failure. Visceral angioedema is a known rare adverse effect of angiotensin-converting enzyme inhibitors. An onset of less than 7 days after initiation of treatment is mostly seen, although more chronic forms may be possible. The frequency, duration, and severity of attacks may vary, but most cases are mild and resolve within 24-48 hr after discontinuation of the drug. A temporal relation between the initiation or discontinuation of medication and angioedema should be valuable as a diagnostic criterion.

Angioedema is caused by a vascular leakage of serum from small vessels in mucous membranes. Visceral angioedema results in a layering of the small bowel wall (small bowel target sign) caused by edematous low attenuating submucosa with fluid density, surrounded by higher attenuating outer muscular layer and brightly enhancing thickened mucosa. Fluid accumulation in the small bowel or together in the small bowel and the colon, prominent mesenteric vessels and some ascites may be noted. Findings are segmental and transient and only seen during an acute episode with return to normal after an attack. In the patient described, follow-up CT examination was performed 7 days after discontinuation of angiotensin-converting enzyme inhibitor therapy and showed a complete resolution of abnormalities.

The differential diagnosis based on CT findings (target-like bowel wall thickening) include ischemia, shock bowel, radiation, vasculitis (e.g. Henoch-Schönlein purpura), intramural bleeding from trauma or anticoagulation therapy, hemophilia, nephrotic syndrome, infectious enteritis, inflammatory bowel disease (Crohn's disease) and medication (e.g. angiotensin converting enzyme inhibitor).

Reference

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