

Case report

Radiation Duodenitis: A Rare Cause of Gastrointestinal Bleed

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Upper gastrointestinal bleed due to erosive gastroduodenitis is often due to alcohol or non steroidal anti inflammatory drugs. Radiation induced injury is a rare cause for GI bleed. We report one such patient who had recurrent haemetemesis due to radiation induced vascular lesions.

CASE DETAILS

A 60 year old lady, a known hypertensive, presented with upper gastrointestinal bleed on three occasions within a period of 15 days, requiring 8 units of blood transfusion. There were no history suggestive of chronic liver disease, ulcer related symptoms or history of NSAID exposure. She was not a diabetic. She had nephrectomy followed by radiotherapy for renal cell carcinoma in the preceding year.

Except for pallor, physical examination was non contributory. Systemic examination was unremarkable. On examination of the abdomen, a right nephrectomy scar was seen and there was mild tenderness in the epigastrium.

On investigating, her baseline hemogram showed a low haemoglobin of 5.1 gm/dL, a normal total and differential cell count of 4,950 cells/cumm and polymorphs 70%, lymphocytes 26%, eosinophils 03% and monocytes 01% respectively, Erythrocyte sedimentation rate was 130 mm at 1hr. Platelet count was 5,75,000 cells/cumm. Bleeding time was 3 min, clotting time was 6 min, APTT and PT were normal. Peripheral smear showed microcytic, hypochromic red blood cells. WBC morphology was normal.

Platelet count was increased; there were no parasites or immature cells. X-ray chest, ECG and Echocardiogram were normal. USG abdomen showed grade I hepatic steatosis. Upper gastrointestinal endoscopy showed multiple gastric and duodenal erosions and vascular ectasia (Fig 1a).

She was managed with three sessions of Argon Plasma Coagulation (APC) at 3 weekly interval. Endoscopy done three months later showed complete resolution of the lesions (Fig 1b and 1c). Her subsequent progress has been uneventful, with no further bleed.

DISCUSSION

The natural history and management of radiation induced injury of the gastrointestinal tract was reviewed by de Cosse et al as early as 1969.¹ Symptoms often manifest within one year of treatment and mucosal ulceration occurs in a high proportion of cases.

GI bleed is a rare complication following radiation. Burns et al in 1971 reported a similar case of GI bleed three years after right nephrectomy and irradiation for hypernephroma.² A limited partial gastroduodenectomy was carried out with retrocolic gastrojejunal reconstruction. Toyoda et al reported GI bleed due to radiation duodenitis following irradiation for hepatocellular carcinoma.³ This was successfully treated with APC using a dual channel endoscope.

The degree of injury is proportional to the radiation dose delivered to the segment of small intestine that lies within the radiation field.^{4,5} First part of duodenum, distal ileum and caecum are the most vulnerable portions of intestine to radiation injury because of their relative fixity to the underlying retroperitoneum.^{6,7}

Radiation induced small intestinal injury manifests clinically within a year of therapy and death related to radiotherapy induced complications occurs in a third of pa-

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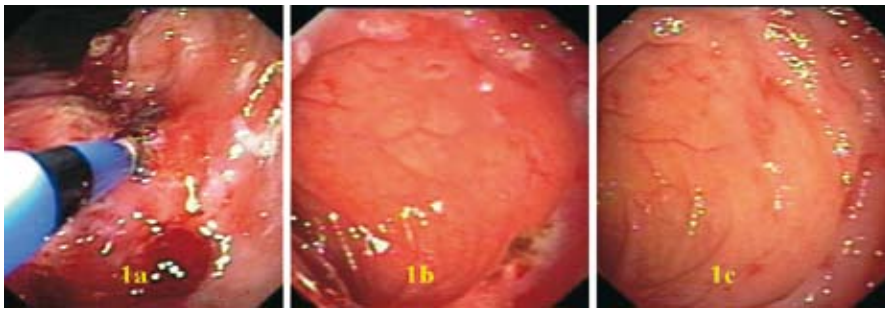


Fig 1a: Upper GI endoscopy showing multiple superficial vascular ectatic lesions and erosions in duodenum during the initial sitting of APC.

Fig 1b & 1c: Serial endoscopic views showing gradual resolution of mucosal vascular lesions following APC.

tients.¹ Nausea, diarrhea and abdominal discomfort are the cardinal manifestations of acute injury. These are attributable to epithelial cell death and subsequent loss of mucosal function, mediated by inflammatory cytokines. Resolution of symptoms occurs within two weeks, following regeneration and restoration of a functional epithelium.⁸

Late presentation occurs a year or two after radiation exposure (chronic injury), but rarely after 20 years. These include recurrent abdominal pain, subacute intestinal obstruction, diarrhea due to bacterial overgrowth and occult GI bleed. Overt GI bleed is rare. Vascular damage with progressive localized ischemia causes obliterative endarteritis, resulting in erosions and ulceration of mucosa. End result is bleeding, fibrosis with stricture and rarely fistulization and perforation.⁶ Histologically, there is glandular disarray, amyloid deposition, smooth muscle atrophy, thrombosis, ischemia, telangiectasia of the intestinal wall vessels and fibrosis.⁹ The vascular ectasia is responsible for the GI bleed, which is best treated by APC as was possible in our case.

Hyperbaric oxygen and surgical resection of the affected segment are alternative modalities for stricturous lesions of the intestine. Hyperbaric oxygen therapy increases oxygen tension, stimulates fibroblast and collagen formation and facilitates angiogenesis in ischemic tissue, which in turn raises the oxygen levels in the irradiated tissues.¹⁰

Radiation induced duodenitis is a rare cause of upper gastrointestinal bleeding and must be considered in the dif-

ferential diagnosis of a patient who has in the past been exposed to radiotherapy.

REFERENCES

1. de Cosse J J, Rhodes R S, Wentz W B, Reagan J W, Dworakan H J and Holden W D. *Ann. Surg.* 1969; 170: 369
2. Burn JI. Radiation duodenitis. *Proc R Soc Med.* 1971 April; 64: 395–396.
3. Toyoda H, Jaramillo E, Mukai K et al. Treatment of radiation induced hemorrhagic duodenitis. *Endoscopy* 2004; 36:192.
4. Perez CA, et al. Radiation therapy morbidity in carcinoma of the uterine cervix: dosimetric and clinical correlation. *Int J Radiat Oncol Biol Phys* 1999;44:855
5. Miller AR, et al. The incidence and clinical consequences of treatment-related bowel injury. *Int J Radiat Oncol Biol Phys* 1999;43:817
6. Withers HR, McBride WH. Biological basis of radiation therapy. In: Perez CA, Brady LW, eds. *Principles and practice of radiation oncology.* Philadelphia: Lippincott-Raven, 1997:79.
7. Fajardo LF. Radiation induced pathology of the alimentary tract. In: Whitehead R, ed. *Gastrointestinal and oesophageal pathology.* 2nd edition. New York: Churchill Livingstone, 1995:957
8. Tarpila S. Morphological and functional response of human small intestine to ionizing radiation. *Scand J Gastroenterol* 1971; 6[Suppl 12]:1.
9. Stone HB, Coleman CN, Anscher MS, McBride WH. Effects of radiation on normal tissue: consequences and mechanisms. *Lancet Oncol* 2003;4:529-36
10. Mathes SJ, Alexander J. Radiation injury. *Surgical Oncology Clinics of North America.* 1996; 5:809-42.