



## SCIENTIFIC LETTERS

### Bowel obstruction secondary to radiation enteritis: A case report<sup>☆</sup>



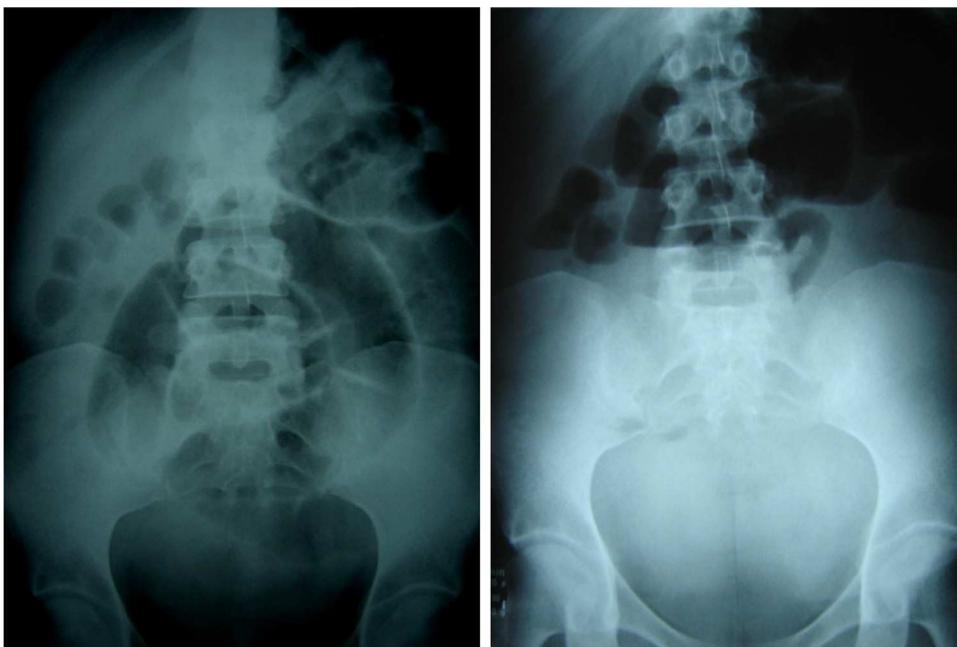
#### Oclusión intestinal secundaria a enteritis por radiación. Reporte de caso

Radiotherapy forms part of the treatment for neoplasia,<sup>1</sup> and an estimated 50% of cancer patients will receive this therapy during their treatment.<sup>2</sup> The harmful effect of ionizing radiation can be experienced long after the primary disease for which it was indicated has been resolved. In the gastrointestinal tract, it can damage the small bowel, resulting in what is known as «radiation enteritis», which

can cause bowel obstruction. When it affects the colon it is called «radiation colitis» and «radiation proctitis» when it involves the rectum.<sup>3</sup>

We present herein the case of a patient with bowel obstruction secondary to radiation enteritis that developed years after her treatment for cervical cancer; our aim is to increase awareness of the fact that this disease should be suspected in patients that have undergone radiation.

A 48-year-old woman had an 8-month history of chronic, colicky abdominal pain. In the mornings her abdomen was soft and pain free, but as the day progressed she felt bloated and had abdominal pain. She did not complain of vomiting and her bowel movements were normal. The patient stated that she had presented with cervical cancer 4 years earlier and received radiotherapy. She later underwent a total



**Figure 1** Plain abdominal x-ray in decubitus with dilatation and centralization of the small bowel segments and air-fluid levels in the standing projection.

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hysterectomy that resulted in disease remission. The physical examination revealed a soft, nondistended abdomen. No masses or organomegaly were palpated, peristalsis was present, and there were no signs of peritoneal irritation. A colonoscopy was done to rule out rectosigmoid pathology, finding images consistent with radiation proctopathy and no evidence of stricture. The patient was released after the study and only given topical treatment with mesalazine in suppositories. Twenty-four hours after the colonoscopy, she went to the emergency department due to intense colicky pain and abdominal distension. Plain abdominal and chest x-rays were ordered because there was a suspicion of a possible perforation during the colonoscopy.

The chest x-ray showed no evidence of free subdiaphragmatic air and the abdominal film displayed the presence of very dilated, centralized small bowel segments and air-fluid levels (fig. 1). Conservative management with nasogastric decompression was begun, after which a water-soluble contrast study was carried out; a narrowing at the region of the ileum was identified, along with persistent segment distension. The laboratory work-up reported: Hb 16.0 g/dl, leukocytes 8,600 x mm<sup>3</sup>, segmented neutrophils 68%, bands 2%, platelets 405,000, glucose 80 mg/dl, urea 27 mg/dl, and creatinine 0.7 mg/dl.

The patient did not improve, so an exploratory laparotomy was performed, revealing, at 20 cm from the ileocecal valve, a zone of the terminal ileum of approximately 30 cm in length that had a firm consistency and was edematous, with clear signs of ischemia, whitish, with areas of serous necrosis, and an obvious reduction in the size of the intestinal lumen (fig. 2). Given the situation, the affected segment was resected and distal closure and terminal ileostomy were carried out. The patient had adequate progression and was released from the hospital on the third postoperative day. The surgical specimen study reported changes due to radiation enteritis. Bowel reconnection with a right hemicolectomy and a latero-lateral ileotransverse anastomosis were performed 4 months later.

Radiation enteritis is a complication that is secondary to the use of radiotherapy in the treatment of pelvic tumors,



**Figure 2** The indurated intestinal zone with edema, clear signs of ischemia, and areas of serous necrosis, with an obvious reduction in the size of the intestinal lumen is shown.

more frequently affecting the small bowel (primarily the ileum) and the colon.<sup>4</sup>

The acute phase of radiation exposure lasts for hours or days with vomiting and diarrhea and is generally self-limited after the radiotherapy is finished.<sup>1</sup> The appearance of the chronic phase can vary and is estimated to occur mainly during the first 5 years, but there have been reports of its presentation spanning from 2 months to up to 25 years after radiotherapy.<sup>5-6</sup>

Incidence and severity depend on the dose of radiotherapy, the size of the lesion to be radiated, treatment frequency, the type of radiation, and the length of follow-up.<sup>1-3</sup> Risk factors include age, smoking, previous surgery, pre-existing pelvic inflammatory disease, and joint chemotherapy administration.<sup>1,7</sup> An established determining factor in cell response to radiation is the stage of the cell cycle; the G<sub>2</sub> and M phases are the periods that are most sensitive to radiation.<sup>2,8</sup> Radiotherapy affects all the layers of the intestinal wall, but the damage is more severe in the

**Table 1** Scoring criteria for acute and chronic radiation morbidity.

Grade	Acute radiation	Chronic radiation
0	No change	No change
1	Increased frequency or change in bowel habit that does not require medication. Rectal discomfort that does not require analgesics.	Mild diarrhea, moderate colic, 5 bowel movements per day, rectal bleeding.
2	Diarrhea that requires para sympatholytic medication, mucous discharge that does not require a sanitary pad, rectal pain that requires analgesics.	Moderate diarrhea and bowel movements with colic more than 5 times a day. Excessive rectal mucus or intermittent Bleeding.
3	Diarrhea requiring parenteral support, severe mucous or blood discharge requiring sanitary pads, abdominal distension.	Obstruction or bleeding that requires surgery
4	Obstruction, fistula, or perforation, gastrointestinal bleeding requiring transfusion, abdominal pain or tenesmus requiring tube decompression or bowel diversion.	Necrosis, perforation, fistula
5		Death directly related to late radiation effects

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mucosa, due to its rapid cell proliferation that induces a rupture in the cell cycle with the subsequent atrophy of the villi, acute inflammation, and fibrosis.<sup>9</sup> Progressive obliterating vasculitis induces ischemia through vascular thrombosis with intestinal wall fibrosis and necrosis.<sup>2,8,10</sup>

Only 20% of the patients are referred for gastroenterologic evaluation because symptoms are either underestimated or not recognized.<sup>3</sup> The Radiotherapy Oncology Group of Philadelphia has proposed a way to stage lesion grade (Table 1).

Radiation enteritis should initially be managed conservatively, but surgery is indicated when complications present.<sup>4</sup> Some of the conservative treatment modalities of intestinal lesions due to radiation are the administration of topical anti-inflammatory agents, such as mesalazine or steroids (budesonide), glutamine, or the endoscopic application of formalin (in the large bowel) when there is bleeding.<sup>1,10</sup>

And finally, surgery should be evaluated in patients with complications from chronic radiation enteritis, given that it is related to a high morbidity rate, prolonged hospital stay, and the possibility of reoperation.<sup>10</sup>

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## Conflict of interest

The authors declare that there is no conflict of interest.

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## Accidental ingestion of magnets in pediatrics: Emerging health problem<sup>☆</sup>



### Ingestión accidental de imanes en Pediatría: un problema de salud emergente

The accidental ingestion of foreign bodies is frequent in pediatrics in children from 6 months to 3 years of age. In 2011 the American Association of Intoxication Control Centers reported 95,705 cases of foreign body ingestion in persons under 20 years of age; 74,725 of those cases were in children under 5 years of age, 80% of which were eliminated spontaneously, 20% required endoscopy, and 1% surgery.<sup>1–3</sup> Among the most common foreign bodies are coins, pieces of toys, batteries, and less frequently, magnets.

The accidental ingestion of high power magnets (invented in 1982, composed of iron, boron, neodymium, and samarium-cobalt, with a 10-fold greater power of attraction and strengths of up to 1,300 G capable of attracting through 6 layers of intestine) has increased in children under 5 years of age due to their availability in desk accessories, toys, piercings, and necklaces with supposed healing power. In 2006, 20 cases were reported by the U.S. Centers for Disease Control, 75% of which were associated with bowel perforation, and in 2008 there were 200 reports.<sup>4,5</sup> There has been a peak in accidental ingestion of magnets in children between the ages of 2 and 4 years and 8 and 10 years and it is more frequent in males at a reported 55–72%.<sup>6</sup>

We describe herein a case of accidental ingestion of several magnets in an older lactating child that presented with gastrointestinal symptoms and whose early endoscopic management reduced the associated morbidity described in the literature.

## Clinical case

A previously healthy 23-month-old male child presented with colicky abdominal pain and hyporexia accompanied

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