
Articolo Originale - Original Article

Tetanic crisis as presentation of combined malabsorption in radiation enteritis: A case report

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ABSTRACT: *Chronic enteritis represents a significant consequence of pelvic irradiation for uro-gynecological cancers. Besides abdominal and stool disturbances, this condition may lead to generalised malabsorption. The authors described the case of an aged malnourished woman, previously operated and irradiated for uterus cancer, in whom a subclinical malabsorptive status turned into a tetanic crisis after an urgent small bowel resection due to radiation enteritis-related intestinal obstruction. After resolution of the metabolic emergency with appropriate therapy, the patient was put on long-term partial parenteral nutritional regimen associated with a specific dietetic program and calcium supplementation, which led to the full recovery of the clinical condition as well as the nutritional parameters. This case emphasises the importance of extensive assessment and early treatment of the multiple nutritional and metabolic deficiencies secondary to multifactorial pathology-related malabsorption (even if preclinical), thus avoiding potentially life-threatening clinical consequences. (RINPE 2004; 22: 12-5)*

KEY WORDS: *Cancer, Radiotherapy, Chronic enteritis, Malabsorption, Tetany*

PAROLE CHIAVE: *Cancro, Radioterapia, Enterite cronica, Malassorbimento, Tetania*

INTRODUCTION

Radiotherapy used for the treatment of genitourinary tumours can significantly affect intestinal mucosa and subsequently induce malabsorption. Precipitating factors for bowel damage are represented by age, malnutrition, radiation dose, associated pathologies such as diabetes, hypertension and adherences from previous surgical treatments (1, 2). Strict clinical surveillance is mandatory in these patients in order to promptly recognize and treat damaged intestine-related consequences.

Acute radiation enteritis usually occurs within the first week from the end of radiotherapy, resolves within 4-6 weeks, and it is clinically characterised by nausea, vomiting and abdominal pains. On the contrary, the chronic form is insidious, often asymptomatic at the beginning, with the first clinical manifestations usually occurring 9-12 months after radiotherapy. Besides symptoms due to mechanical obstruction or perforation, chronic radiation enteritis is less frequently characterised by signs or symptoms related to selective or generalised malabsorption (1, 2).

We herein describe the case of a malnourished woman, previously operated and irradiated for uterus cancer, who presented a tetanic crisis a few days after the intestinal resection for an occlusive syndrome secondary to radiotherapy-induced chronic enteritis. The combined use of the long-term partial parenteral nutrition regimen, together with an appropriate diet and oral calcium supplementation, led to a significant improvement in the clinical condition as well as the biochemical parameters.

CASE REPORT

A 69-year-old woman underwent total hysterectomy plus salpingoophorectomy in 1998 for an invasive adenocarcinoma of the uterus (T1 No Mo, grading G2) followed by pelvic irradiation. During the following 3 years the patient was healthy and there was no recurrence of the cancer. In 2001, a pre-toxic multinodular goitre was diagnosed and the patient was subjected to therapy with low-dose (5 mg/day) methimazole. In No-

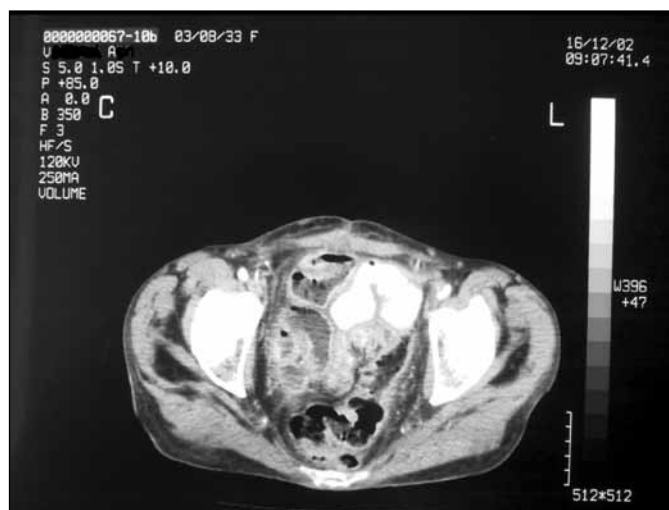


Fig. 1 - Computed tomography scan of the patient's abdomen showing distension of the handles of the small bowel, mostly affecting the pelvis, where hyperaemia of the wall due to post-actinic sequelae is present.

November 2002, the patient began complaining of severe abdominal pains and constipation. A barium x-ray examination of the abdomen revealed a small bowel obstruction secondary to radiation chronic enteritis as evidenced by computed tomography scan (Fig. 1). Subsequently, a 30-cm ileum-resection followed by an ileum-caecum anastomosis was immediately performed. Macroscopic histological evaluation showed a thickened bowel wall with telangiectasias and adhesions, whereas the microscopic examination revealed the presence of oedema of the mucosa, fibrosis, obliterative endarteritis and lymphatic ectasia. A few days after discharge, the patient started complaining of tingling sensations in the perioral area and paraesthesias at the upper limbs with appearance of carpopedal spasm (Chvostek's sign). She was therefore referred to an emergency unit where a hypocalcemic (Ca: 5.6 mg/dL, n.v. 8.5-11) tetanic crisis was diagnosed and successfully treated with i.v. calcium gluconate. Physical examination revealed clear features of malnutrition (BMI: 16.8 kg/m²) like dry pale skin, reduced subcutaneous adipose tissue and oedemas at the lower limbs. The persistence of a latent "tetanic status" was documented by the presence of Trousseau's sign. The anamnestic report evidenced an increased stool frequency and a 20-kg-loss within the preceding 2 years not associated with reduced food intake. In particular, a weight loss of 6 kg (50 to 44 kg) during the previous 6 months was recorded. The biochemical tests showed normochromic normocytic anaemia (haemoglobin: 8.8 g/dL), hypocalcemia (5.6 mg/dL) with secondary hyperparathyroidism (PTH: 77.6 pg/mL; n.v. 5-50), normophosphataemia (2.9 mg/dL; n.v. 2.5-4.5), hypomag-

nesaemia (0.9 mEq/L; n.v. 1.9-2.5), hypokaliemia (2.6 mEq/L, n.v. 3.5-5), hypoproteinaemia (5.3 g/dL, n.v. 6.2-8.2), hypoalbuminaemia (2.8 g/dL, n.v. 3.5-5), and reduced levels of transferrin (173 mg/dL, n.v. 200-360) and total lymphocyte count (779/mm³, n.v. ≥1500). Stool examination evidenced fatty acids and starches. The nutritional evaluation led to the diagnosis of severe caloric-proteic malnutrition and to the introduction of an appropriate therapy.

Haemoglobin levels were implemented by the infusion of one package of concentrated red blood cells. In addition, a central Port was inserted and a partial parenteral nutritional therapy with a 1875 mL solution supplying 1500 Kcal and composed of 120 g carbohydrates, 75 g lipids, 60 g aminoacids, and electrolytes (Nutriperi Lipid 1875, BBraun, S.p.A., Milan) was started. In order to fully balance the electrolyte levels, further i.v. infusions of calcium gluconate and magnesium sulphate were required. Afterwards, calcium was switched to oral administration (2 g/day). A rapid significant improvement in the clinical condition occurred, and 7 days after admission, the patient was discharged and assigned to a partial parenteral nutritional regimen three times a week in day hospital setting. The nutritional regimen was based on the infusion of a 1250 mL solution supplying 1000 Kcal and supplemented with 80 g carbohydrates, 50 g lipids, 40 g aminoacids, and electrolytes (Nutriperi Lipid 1250, BBraun, S.p.A., Milan). In addition, a hypercaloric (1900 Kcal), hyperproteic (1.2 g/kg/b.w./day) and poor-fiber diet was initiated, with medium chain-triglycerides oil (MCT) supplying one-third of the lipid requirements. After four weeks of such combined nutritional therapy, the patient's body weight increased by 6 kilograms, the oedema was completely resolved and overall well being was significantly improved. Biochemistry tests showed improved total protein concentration (6.1 g/dL), haemoglobin (9.8 g/dL) and total lymphocyte count (1152/mm³), whereas calcium (9 mg/dL), PTH (34 pg/mL), and transferrin levels (245 mg/dL) had normalised. The stool examination was normal.

After one further month of therapy, BMI normalized (19.8 kg/m²) while only a slight normochromic normocytic anaemia persisted (haemoglobin: 11.2 g/dL).

The current patient's clinical condition is satisfactory and the partial parenteral nutritional program has been subsequently reduced to once a week.

DISCUSSION

The case reported shows an unusual clinical presentation of severe electrolyte deficiencies due to malabsorption. In this setting, the subclinical intestinal impairment, secondary to the radiotherapy-induced chronic enteritis, assumed clinical relevance as tetanic crisis after partial small bowel resection (3). The metabolic emer-

gency was likely due to the combination of calcium, magnesium and vitamin D deficiencies secondary to impaired absorption.

Radiotherapy represents an outstanding tool in the management of genitourinary tumours. In relation to this, it is well known that whereas acute radiation enteritis is usually a self-limiting disorder correlated with reversible mucosal modifications of the intestine, chronic radiation injury, present in 5-15% of the patients receiving pelvic radiotherapy, can lead to serious medical complications such as perforation, obstruction and malabsorption usually 9-12 months after irradiation. Risk factors for radiation chronic enteritis include a radiation dose of more than 45 Gy, previous surgery, concomitant or previous chemotherapy, vascular diseases, and genetic predisposition such as an anomalous fibroblast reaction (1, 2). Depending on the malfunction of a more or less large fragment of the intestine, malabsorption can result in severe clinical consequences or be asymptomatic (1, 2, 4-6). In the pathogenesis of radiation-induced intestinal damage, free radicals play a major role and can damage the epithelial cell membranes by lipid peroxidation. According to this hypothesis, the use of an elemental diet together with antioxidants has been advocated as an adjuvant tool to reduce radiation toxicity on the small intestinal mucosa, but conclusive evidence is still lacking (4).

In our case, the metabolic emergency (i.e. tetanic crisis) eventually occurred as a consequence of medical malpractice; as a matter of fact, no assessment of the nutritional and metabolic status was performed by the various physicians (general practitioner, gynecologist and surgeon) who followed the patient over the years.

From a physiopathological point of view, the malabsorption ascertained in our patient proved secondary to the radiation chronic enteritis, given that the intestinal obstruction occurred as an acute event and thus did not likely cause any reduction in food intake or impairment in the absorption mechanisms during the previous months.

Our patient's multiple nutritional deficiencies were successfully reverted by the combination of partial parenteral nutrition, oral mineral supplementation and specific dietetic regimen supplemented with MCT oil. Given its particular chemical features, this product finds applications in patients with impaired small bowel function, particularly fat malabsorption, where it is easily absorbed and transformed into energy by the liver (7, 8).

In conclusion, the case described strengthens the importance of adequate investigation and early treatment of multiple nutritional and metabolic deficiencies in patients with malabsorption secondary to combined pathologies, in order to prevent hazardous

clinical consequences.

In addition, it highlights how a mild unrecognised malabsorption may become clinically "evident" following the superimposition of a new pathological event.

RIASSUNTO

L'enterite cronica rappresenta una conseguenza non trascurabile dell'irradiazione pelvica per tumori uro-ginecologici. Oltre ad alterazioni addominali e dell'alvo, questa patologia può causare un malassorbimento generalizzato. Gli autori descrivono il caso di una donna anziana e malnutrita, precedentemente operata ed irradiata per un tumore uterino, in cui uno stato di malassorbimento latente si è drammaticamente slatentizzato in forma di crisi tetanica, a seguito di una resezione parziale del tenue per sindrome oclusiva secondaria ad un'enterite cronica attinica. Dopo la risoluzione dell'emergenza metabolica con terapia specifica, la paziente ha avviato un programma di nutrizione parenterale parziale a lungo termine associato ad un regime dietetico appropriato e supplementazione calcica, che ha portato ad un pieno recupero delle condizioni cliniche e dei parametri biochimici.

Il caso presentato evidenzia la necessità e l'importanza di valutare accuratamente e trattare precocemente i molteplici deficit nutrizionali secondari ad un malassorbimento (anche preclinico) correlato a pluripatologie, al fine di evitare severe conseguenze cliniche.

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