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Review Article

REVIEW ON RADIATION-INDUCED PROCTITIS & ENTERITIS

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Abstract:

Radiation enteritis is becoming more common as more cancer patients receive radiotherapy and their long-term survival improves. This overview covers causes, diagnosis, treatment, and prevention. Radiation enteritis, research, therapy, and prevention were searched for in published studies. Chronic radiation enteritis is documented in up to 20% of pelvic radiotherapy patients, however, this may underestimate its true frequency because not all patients with gastrointestinal symptoms following radiotherapy seek medical attention. Low body mass index, abdominal surgery, and co-morbid disorders predispose to chronic radiation enteritis. Radiation dose, fractionation, method, and chemotherapy may also play a role. Chronic radiation enteritis has many clinical characteristics because it can affect any GI organ. Symptom etiology may be complicated, thus it's vital to arrange studies systematically. Nutrition, antidiarrheals, anti-inflammatories, antibiotics, probiotics, pentoxifylline, tocopherol, cholestyramine, hyperbaric oxygen, endoscopic, and surgical therapy have been studied. Given the morbidity and mortality of chronic radiation enteritis, tissue-sparing irradiation treatments are examined. In conclusion, therapeutic and preventative methods for chronic radiation enteritis have minimal evidence, but an organized approach to studying gastrointestinal symptoms following irradiation might allow improved targeting of current medicines. Closer collaboration between oncologists and gastroenterologists will permit a more systematic approach to managing patients and building clinical and research networks for this increasing disease to strengthen its evidence basis.

Keywords: *Gastrointestinal Haemorrhage, Proctitis, Radiation Injury, Bacterial Overgrowth.*

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INTRODUCTION:

X-rays were first discovered by Wilhelm Roentgen in 1895, which marked the beginning of a new era in the field of medical research and therapy. Only one year later, in January of 1896, Emil Grubbe made the first attempt to use radiotherapy as a treatment for breast cancer [1]. This was quickly followed in 1897 by the first report of radiation-induced damage to the gut. Predictably, the ever-increasing number of patients treated with radiotherapy has been paralleled by a comparable increase in the number suffering from gastrointestinal complications. This is due to the fact that radiotherapy is a potentially dangerous treatment. At present, an injury to the colon and small intestine that occurs as a result of radiotherapy is referred to as "radiation enteritis." This does not include damage to the rectum, which is referred to separately as "radiation proctitis," according to a recent review that was conducted by Leiper and Morris as well as by Denton and colleagues [2].

Acute radiation enteritis can be subdivided into chronic radiation enteritis. Patients who have acute radiation enteritis typically present with diarrhea and abdominal pain shortly after a course of radiotherapy, with symptom resolution typically occurring rapidly within three months. Chronic radiation enteritis can be subdivided into acute radiation enteritis and chronic radiation enteritis.

In the past quarter of a century, there has been a rise in the number of cases of pelvic malignancy treated with megavoltage irradiation therapy. Patients who were diagnosed with cancer of the prostate, cervix, ovary, uterus, or rectum have seen a significant improvement in their prognosis as a result of receiving this treatment. The close proximity of these cancers to other normal pelvic organs has also led to an increase in radiation-induced complications, which can make the management of these complications more challenging. Proctitis chronic due to radiation exposure is one of these late sequelae. In this review, we will attempt to describe the epidemiological, pathological, and clinical features of this condition, in addition to providing a summary of the relevant research regarding its treatment [3, 4].

Epidemiology And Pathogenesis:

Due to a lack of prospective trials as well as variability in the definition and grading systems used for the condition, the true incidence of chronic radiation proctitis is unknown. The incidence of clinically significant chronic radiation proctitis was found to be 3.3% in a large prospective study conducted after radiation therapy was administered

for the treatment of prostatic carcinoma. Clinically significant chronic radiation proctitis was defined as symptoms that required the patient to be hospitalized or require the patient to undergo at least minor surgical intervention. In this particular study, a minimum follow-up period of seven years was required. In retrospective studies with varying sample sizes, radiation doses, and types of pelvic malignancy treated, the incidence of chronic radiation proctitis ranges between 2 percent and 20 percent, with approximately 85 percent of patients developing symptoms within the first two years after treatment. In addition, the incidence of chronic radiation proctitis increases with increasing radiation doses [5]. A direct or indirect effect of radiation on cellular DNA might result in cell death or hindered cell division. This type of radiation has a direct detrimental effect because of the absorption of energy from the incident radiation, which is usually protons or neutrons. In the case of radiation's indirect effect, free radicals are frequently released as a result of radiation's contact with cellular water. Free radicals damage DNA and inhibit replication. The G2 and M phases of mitosis are the most sensitive to these processes, which explains why the constantly reproducing intestinal mucosa is vulnerable to radiation-induced damage [6]. Damage to and death of stem cells within intestinal crypts during replication and differentiation leads to a reduction in the production of differentiated intestinal epithelial cells and a loss of mucosal integrity.

Histopathology:

During acute radiation injury, mucosal atrophy and dense infiltration of the lamina propria with plasma cells and polymorphonuclear leukocytes are observed. Epithelial denudation, crypt micro-abscess formation, and mucosal ulceration are all symptoms of crypt micro-abscess formation and crypt mitoses being reduced. Nutrient and fluid loss occur as a result of epithelial failure, while the increased intestinal permeability to gut bacteria might further worsen mucolytic inflammation [7]. Transforming growth factor b1 and its effector, connective tissue growth factor (CTGF), play a significant part in the fibrotic phase of chronic radiation enteritis, probably due to an increase in Rho pathway activity. Vascular and telangiectatic vessel degeneration, mucosal ulceration, intestinal wall necrosis, and serosal adhesion development may occur as a result of these pathogenic alterations. A hemorrhage, stricture, or fistula could emerge as a result of these changes and seriously compromise intestinal function.

Clinical manifestations:

Clinical symptoms of chronic radiation injury commonly occur months to years after exposure, with a median onset time of 8 to 13 months in most published series, but latency as long as 30 years. Mucous rectal discharge, diarrhea, urgency, rectal pain, and bleeding are symptoms of radiation proctitis. Bleeding may require frequent transfusions. 55% of cases require blood transfusions before definitive treatment. Fistulas, perforations, and rectal strictures are less common. These consequences occur following rectal bleeding. Fecal urgency and bleeding affect the quality of life the most [8]. Most cases involve rectal bleeding. Clinical assessment is crucial. Radiation treatment history may need months or years of questioning. Asymptomatic history helps define illness severity and patient effect. This affects decision-making. Differentiating radiation injury from recurring tumors, localizing and grading radiation injury, and assessing the patient's fitness for therapy are key challenges in assessment. Investigating these concerns is crucial. Flexible sigmoidoscopy or colonoscopy and biopsy assist assess radiation injury and differentiating between recurring tumor and radiation harm. A CT scan of the abdomen and pelvis and chest X-ray may be needed to rule out distant metastatic illness, which could affect treatment. Endoscopic examination shows typical radiation proctitis alterations, which begin 8–10 cm proximal to the anus and continue proximally. Telangiectasia, erythema, and friability are prevalent.

Therapeutic approach:

Newer endoscopic procedures are preferable to medicinal therapy for treating persistent radiation proctitis. Oral and rectal steroids, sucralfate, 5-aminosalicylates, and fatty acid enemas have been tested. Non-randomized trials and retrospective series aren't persuasive for this condition. No randomized trial has shown long-term placebo superiority. Small retrospective case series report moderate success with hyperbaric oxygen. Eight of 14 and four of 17 patients in two sets stopped bleeding completely [9]. This inconvenient and pricey therapy requires 20 to 40 sessions.

Topical formalin:

Radiation-induced cystitis was the first place where the use of topical formalin to treat radiation harm was initially documented. A local chemical cauterization of telangiectatic mucosal vessels is most likely its mode of action. Using formalin-soaked gauze or a direct instillation, this procedure entails saturating a small patch of skin in the rectum with 4 percent formalin. Continue the treatment for 2–3 minutes or until mucosal blanching begins [10].

Anti-inflammatory Agents:

There is a paucity of information on the prevention and treatment of chronic radiation enteritis with aminosaliculates, even though these compounds have been explored in the past for acute radiation enteritis. All four patients with chronic radiation enteritis showed clinical and radiological improvement over one year of treatment with the aminosaliculate sulphasalazine. The use of corticosteroids in the second study of 24 patients with chronic radiation enteritis was assessed with and without total parenteral feeding in this series as well. Methylprednisolone, according to the researchers in the latter study, may enhance the effects of 'intestinal rest' facilitated by parenteral nutrition. Larger trials are needed to determine whether aminosaliculates have long-term positive effects in slowing disease progression in chronic radiation enteritis, as there is insufficient data and adverse effects associated with corticosteroid use to use them consistently [11].

Probiotics and Antibiotics:

No research has looked at the effectiveness of probiotic-induced modification of the gut microbial community in preventing acute radiation enteritis. Patients with chronic radiation enteritis are at an increased risk of developing bacterial overgrowth, which, as previously indicated, can be treated with antibiotics when it occurs. Few studies have been done to determine the best course of antimicrobial therapy. Nine patients with chronic diarrhoeal symptoms and positive [C14]-D-xylose breath tests 2 years after pelvic irradiation were studied by Danielsson and colleagues for the effects of oral metronidazole and doxycycline medication. Only 33% of patients with chronic radiation enteritis saw improvement in their diarrhoeal symptoms after taking this combination of antibiotics, which may reflect the breath test's poor sensitivity and specificity or the (often) complex etiology of diarrhoeal symptoms. The antibiotic choice for bacterial overgrowth in clinical practice is often empirical, with patients sometimes failing to respond to one antibiotic and then responding well to a second, and in some cases, lengthy and cyclical rounds of antibiotics may be required [12].

Surgery:

Radiation proctitis surgery is currently considered the last option and should only be done in 'difficult' cases of the condition. Since novel local therapy has been introduced, the necessity for surgery in patients with recurrent rectal bleeding has decreased dramatically. Patients with radiation proctitis at one institution required surgery less than 10 percent of the time, but greater rates have been documented in the past.

Rectal strictures and fistulas are the most common grounds for surgery. Recto-ileal, ileo-vaginal, and vesicovaginal fistulas are less common, but all have been documented [13].

Diverting stoma:

For complex rectal strictures and fistulas, colostomy or ileostomy can be used before definitive surgical excision or if radical surgery is too risky. Anal canal ulcers can benefit from a healing time of many months if they are severe and painful. However, diversion colostomies have not been shown to reduce bleeding in these individuals and should not be utilized for this purpose. For safety reasons, only the bowel that has not been damaged by radiation should be utilized to create a stoma.

Reconstruction:

Radiation-induced rectovaginal fistula can be treated with a local advancement rectal flap. Well-vascularized tissue may aid healing by being placed in between wounds. Disappointing has been the use of either a fat pad from the labium major or from the gracilis muscle, which advocates for a procedure that does not involve full mobility of the rectum.

By dividing the sigmoid colon and opening the rectal stricture, the normal colon can be used as a patch to close the stricture and prevent the fistula from developing. Resecting the rectum to the level of the fistula and then performing a diverting ileostomy is our preferred method. The left colon and splenic flexure must be fully mobilized for this procedure to be effective. In the early postoperative phase, an auxiliary colonic J pouch may improve anorectal function even more.

CONCLUSION:

Chronic radiation proctitis is predicted to become increasingly common as radiation therapy for pelvic malignancies becomes more common. The condition improves over time, but some individuals need treatment for symptoms or problems. Better radiation treatments should reduce rectal strictures and fistulas. No randomized controlled trial has examined a therapeutic strategy for problematic rectal bleeding, although we recommend endoscopic therapy with argon plasma coagulation or topical formalin therapy. Resistant rectal bleeding and radiation-induced strictures and fistulas require surgery. Postoperative results are dismal.

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