

RADIATION ENTERITIS AS A CAUSE OF INTESTINAL OBSTRUCTION – CASE REPORTS

Momčilo Stošić

The role of the radiation therapy in the treatment of pelvic cancer becomes increasingly important because of its positive effects. It is particularly evident in the treatment of prostate cancer, certain stages of some gynecological cancers, as well as before and / or after rectal cancer surgery. It also produces negative effects of which the most common are post-irradiation cystitis, enteritis and colitis. As a consequence of the radiation changes on the intestines, ileus may develop as one of the gravest complications.

The total number of patients operated in our ward because of the post-irradiation ileus by a single surgeon is seven during the period of twenty years. The aim of this paper is to present two characteristic cases out of the seven operated patients regarding the fact that general conclusions cannot be drawn for all seven of them. By selection of references, we would like to point to the importance of particular protective, diagnostic and therapeutic procedures i.e. of various surgical options. *Acta Medica Medianae* 2014;53(1):42-46.

Key words: *post-irradiation enteritis, ileus*

Department of Surgery, Health Centre Vranje Serbia

Contact: Momčilo Stošić
Vojvode Mišića 17
17500 Vranje, Srbija
E-mail: momcilostosic@gmail.com

Introduction

Back in 1897, only two years after the discovery of the X-rays by Wilhelm Roentgen and one year after their use in the treatment of the breast cancer by Emil Grubbea (1), Walsh was the first to describe the damage to the intestines caused by radiation (2).

The therapeutic radiation procedure is applied as a type of an independent treatment, as an adjuvant therapy of gynecological malignancies, or as a neo-adjuvant therapy of the rectal cancer. Radiation enteritis also appears after the radiation of the testicular or prostate cancers. It is described in the form of enteritis and proctitis, but the bladder can also be affected.

Radiation enteritis (RE) is a disease with a rising trend. The main cause is the more frequent use of radiation as a therapeutic procedure in the treatment of the pelvic cancers. Considering the period of time when symptoms appear, enteritis after radiation is regarded as an acute or a late form. The acute form appears during the first three months after the radiation, and the late one - after 18 months and later. The period of six months after the radiation can conditionally be

accepted as the period of distinction between the two forms of radiation enteritis (3). Each form has a different clinical picture and different pathological finding. Ileus as a consequence of RE is the most serious complication of the late form of radiation enteritis.

General review of all cases

In the past twenty years, seven patients were operated on with the diagnosis of ileus as a consequence of the radiation therapy. All surgeries were urgent and absolutely unpost-ponable. All of the patients were females who had undergone radiation because of gynecological cancers. The first report from our ward has already been published (4).

The results come from a retrospective analysis of the operating material and data related to the operated female patients.

The age of the operated patients ranged from 47 to 68 years, the average being 57 years. The average time of the ileus manifestation was 7.5 years after the radiation. Six out of seven patients had previously been gynecologically operated on. Before developing the intestinal obstruction, all the patients had difficulties with chronic radiation enteritis, and the symptoms of subocclusion had existed six months to two years before the operation. All women were, more or less, underfed.

Characteristic pathological changes were found intraoperatively in all patients. They included irregular narrowings and widenings of intestinal

parts, with a thickening of the changed parts and many adhesions and agglutinated convolutes of the small intestine. The changed parts of the intestines were always without peristalsis. The localization was most frequently the terminal ileum. At the time the indications for the operation were determined, all patients had the symptoms of the chronic ileus: vomiting, x-ray with hydrogaseous levels and occasional abdominal pains. The time which passed from the admission to hospital (and the subsequent diagnosis) to the operation was two hours to five days.

Three out of the seven operated patients died, which is 42% of the total mortality caused by postirradiation ileus.

Case report No 1

In the first case report, we would like to describe a patient whom we operated on four times successively with a propitious final result. The contemporary treatment of the cervical cancer primarily includes the radiation therapy (5). Four years after the radiation, the patient was admitted with an acute bloating of the abdomen, occasional vomiting and colic abdominal pains. She had visited the surgical ward several times before and had always been released home after a clyster and discharge. The gynecological finding was clean, without any signs of recurrence. X-ray imaging was done immediately and it showed "numerous hydro-gaseous levels which point to ileus". The overall picture indicated that the patient was compensated, without signs of ileus, except a slight degree of dehydration. Right after the necessary reanimation, we performed the first operation – a resection of the changed part of the small intestine with a T-T anastomosis and massive adhesiolysis. At the time of the release from hospital, on the tenth postoperative day, her condition deteriorated and we had to perform a reoperation. We saw a rupture of the caecum which, during the first surgery, did not seem changed per oculi. A right hemicolectomy was done. The histopathological analysis confirmed post-radiation enteritis. After being released, the patient restored the passage, but had occasional constipations. A performed irrigography pointed to a "sand-glass" narrowing directly above the upper rectum. The next action was to do a L-L sigma-rectal by-pass of the narrowing, with a protective stoma. Three months later, after the healing and anastomosis check by contrast, the stoma was closed. Six months ago we did a control check by the passage of the small intestine and the finding was good. With the help of a proper diet, the patient is still very active, without any signs of the primary disease or changes in the intestinal passage.

Case report No 2

The second patient we describe here is a woman in her sixties. More than five years had passed since the active treatment of the gynecological cancer. She had occasional colic

pains. On the fourth day following admission, she was operated on because of the signs of gradual deterioration and confirmed diagnosis of chronic postirradiation ileus. Then we found characteristic changes on the intestines approximately 30 cm long and about 80 cm from the lig. Traitzi. The changed part of the intestine was hyperaemic, partly with thickened walls and bent into a barely passable convolute. The proximal part of the intestine was not essentially changed and there was no enteropathic outpouring. Neither the signs of the relapse on the proximal vaginal stump nor any significant adhesions were found. There were also no visible changes on the other parts of the intestines. Preoperatively, the patient had postirradiation leukopenia. The dilemma whether to perform resection and enterostomy only 80cm from Traitzi (with a heavy loss of water and electrolytes) or by-pass, was easily resolved in favor of the by-pass. (Figure 1 and Figure 2).

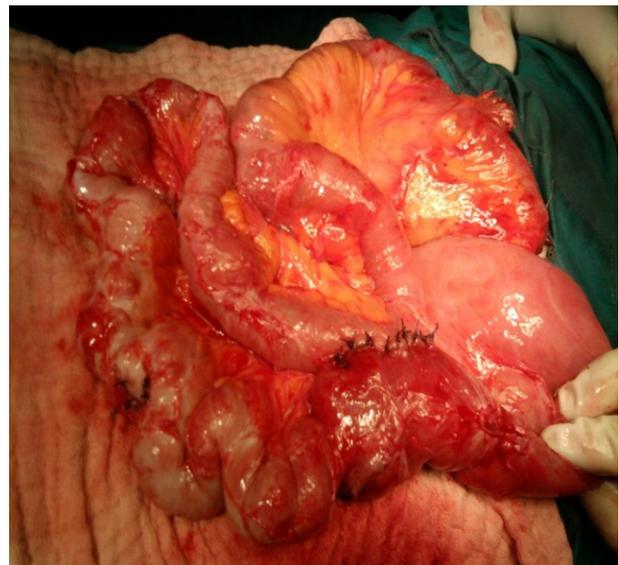


Figure 1. The part of the jejunum changed by radiation

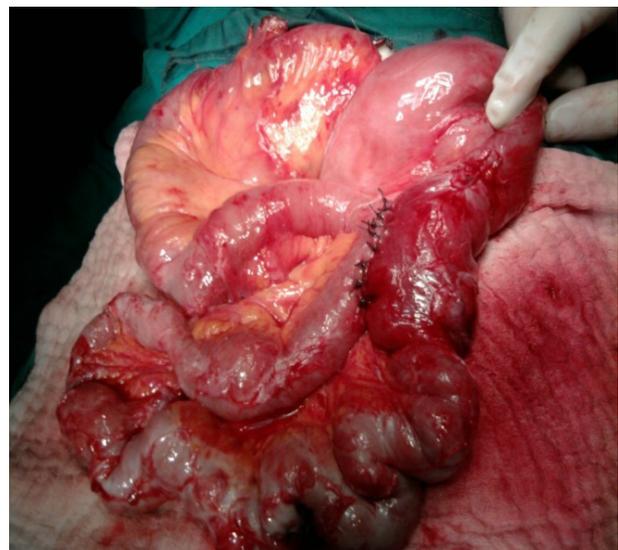


Figure 2. L-L anastomosis at 1m from lig. Traitzi

By gradual adhesiolysis of the very convolute, we completely removed the adhesions, without any injuries to the intestines or serosa, but the passage through the adhesion-free part of the intestine was not established because the intestine was narrowed and the changed part of it was passive. Therefore, we performed the L-L anastomosis and the pouring began immediately. Five days after successful recovery, the patient suffered a tension decline and started to vomit black content, and soon melena ensued, too. A bleeding stress-ulcus was found and after giving 1.5 l of blood and other reanimation techniques, after a whole night's episode with bleeding, we performed urgent gastroscopy with an aim to approach the operative treatment of the stress-ulcus bleeding. The cause of the bleeding was not found, but the patient's cardiovascular system was stabilized and in the next 24 to 48 hours normal intestinal content appeared, without melena. In the following five days, the patient began taking liquid food with the support of the parenteral nourishment through the "central vein". On the tenth postoperative day the patient showed all signs of good recovery with the passage and audible peristalsis, the stool was scarce but mushy, and she began to walk. Nevertheless, on the eleventh day after surgery, her breathing became difficult, which resulted in the decrease of oxygenation at about 60% and the diagnosis of developing ARDS, so she was put on a respirator. Immediately after the respirator was switched on, the patient's partial O₂ was 94%. 48 hours later, she was transferred into a tertiary institution where, despite all efforts, she died after ten days.

Discussion

Seven cases, two of which are presented here, are not enough to draw general conclusions, but we can make certain remarks. It has long been known that the radiation treatment extends the survival time of patients with some types of cancer (6,7). In others it represents the basic aspect of the treatment (8), and the postoperative radiation of some stadia of the rectal cancer has been applied routinely (9). About 5–15% of the radiated people suffer from radiation enteritis (10). It is thought that the preoperative radiation in rectal carcinoma has fewer radiation complications compared with the post-operative one (11). The intra-operative radiation of the rectal cancer has its supporters, too (9). The degree of changes depends on the radiation dose, width of the radiation field and protection of a patient (positioning of a patient so that the intestines are out of the radiation zone, use of natural tissues in order to isolate the intra-abdominal organs - most often in the form of an omental flap, placing of an absorptive mesh around the organs endangered by radiation - most frequently at the entrance to the pelvis (12), and quality of the apparatus) (13).

The pathological changes of RE can be both macroscopic (mostly described here) and microscopic which are characterized by fibrosis in the radiated tissue, obliterative vasculitis, edema, adhesions between tissues, ischemic enteritis and narrowing on the radiated part of the intestine (14).

All our patients were female, which is consistent with other reference works quoting that most of the patients were women (15).

The choice of the surgical method was the resection with anastomosis, resection with a proximal stoma and a sutured distal part of the intestine or with two stomas, and a by-pass which by-passes the changed part of the intestine or just a proximal stoma.

The frequency of the above-mentioned solutions has the following ratio: 75% of resections, 16.7% of by-pass operations and 8.3% of stomas (16). The results of another study are: 65% of resections, 35% of by-pass procedures with protective stomas (17), etc. Of course, the approach is individual and depends on the patient's condition - that is why we have such a variety. Adhesiolysis is always present and it often complicated the main part of surgery - the treatment of the part of the intestines changed by radiation. It is in keeping with our approach and the operations we performed. The factors which influenced them were local: which intestines had been radiated and to what extent, what the length of the changed parts of the intestines was and what the degree of the intestinal changes was, and general: the patient's condition, the level of malabsorption, the associated morbidity and the use of chemo-therapy (which intensifies the effect of the radiation). The first case is an example of multiple changes on the intestines including the colon, and the second one is an example of an uncharacteristic change on the proximal jejunum.

By definition, the most frequently affected zones of the changed intestines include the ileocaecal region (enteritis), which we also confirmed), and the rectosigmoidal junction and rectum (proctitis) - seen only in one out of our patients. Postirradiation bleeding was not registered.

There are still debates about the best surgical strategy. The by-pass operation has been favored for years instead of resection because of fewer technical problems, lesser surgical mutilation and easier healing. However, a by-pass of the damaged intestine is associated with the syndrome of the blind curve and a risk of perforation, bleeding, abscess development, fistulas and even cancerogenesis of the radiated and changed intestine (18).

Mortality due to ileus as a consequence of the radiation is high. According to Allendorf and Whelan, the mortality is 30–50% (10–15%, retrospectively) (19,20). The forms and degrees of the post-irradiation changes are in direct correlation with mortality. There are registered cases of ileus after an acute form of RE (21). Mortality can be

viewed either through the total number of the radiated or through urgent indications i.e. the number of ileus cases. The mortality after the primary surgery has often been described in the literature and it has been quoted that the percentage of reinterventions goes up to 40%, even 60% of the operated with radiation enteritis (22,23). Comparisons that are not standardized often hinder a direct comparison of the mortality of the patients operated because of ileus after

radiation enteritis, and in relation to the severity of pathological changes and physiological exceptions to the normal values in patients. It should be taken into consideration whether a recurrence exists or not and whether another morbidity is present.

Fistulas and especially recto-vaginal fistulas also appear as consequences of the radiation, but they are a separate entity and will not be presented here.

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RADIJACIONI ENTERITIS KAO UZROK ILEUSA - PRIKAZ SLUČAJEVA

Momčilo Stošić

Zračna terapija u lečenju pelvičnih karcinoma je sve značajnija zbog svojih pozitivnih efekata, koji su posebno izraženi kod lečenja karcinoma prostate, pojedinih stadijuma nekih ginekoloških karcinoma, kao i pre i/ili posle hirurgije karcinoma rektuma. Najčešće negativne posledice su supostiradiacioni cistitis, enteritis i kolitis. Kao posledica zračenja promene su na crevima, a dolazi i do razvoja ileusa, kao jedne od natežih komplikacija.

Ukupno je sedam operisanih na našem Odeljenju, od strane jednog hirurga, zbog postiradijacionog ileusa za period od 20 godina. Cilj rada bio je da prikažemo dva karakteristična slučaja od 7 operisanih, s obzirom da se ne mogu izvesti zajednički zaključci za sve operisane. Kroz pregled literature želimo da istaknemo važnost određenih protektivnih, dijagnostičkih i terapijskih postupaka, odnosno, različitih hirurških opcija. *Acta Medica Medianae 2014;53(1):42-46.*

Ključne reči: postiradijacioni enteritis, ileus