

EDITORIAL

The role of radiological imaging in the patient with gastrointestinal symptoms after pelvic radiotherapy

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Date accepted for publication 17 February 2004

Keywords: *Pelvic radiotherapy; cancer; radiation enteritis; radiation proctitis; imaging.*

In recent years there have been sustained improvements in the outcomes from pelvic malignancy, with the introduction of new radiotherapy or combined chemotherapy–radiation treatment schedules^[1,2]. Approximately four out of 10 people with cancer will have radiotherapy as part of their treatment. In the UK this includes about 12 000 patients annually who are treated with radiotherapy for pelvic cancer, mainly with curative intent.

As screening programmes increase the numbers diagnosed at an earlier stage and treatments have become more effective, more patients are surviving longer. However, radical therapy with the aim of curing the patient of their cancer carries a risk for normal tissues around the tumour. During their 6 week course of radiotherapy, partly because of mucosal damage, 80% of patients will develop gastrointestinal problems—mainly diarrhoea, but also abdominal cramps, tenesmus or faecal incontinence. Nevertheless, almost all patients manage to continue with their radiotherapy. In the acute setting, it is very rare for a patient to be referred for gastrointestinal investigations. Perhaps, this is a pity. Frequent specialist evaluation at this stage might have contributed to a better understanding of why the acute radiation reaction sometimes resolves with no gastrointestinal *sequelae*, but in other patients evolves into difficult chronic symptoms or serious complications.

Although it is clear that late gastrointestinal symptoms are not entirely dose related and depend on a complex

interaction of physical, patient-related, treatment and genetic factors, we do not know precisely how often chronic gastrointestinal problems will develop. However, herein lies a problem. Data from our unit suggest that in one-quarter of the patients referred with new gastrointestinal symptoms after radiotherapy, the cause is unrelated to the radiotherapy^[3]. So, just because symptoms start after radiotherapy, it does not necessarily follow that they are caused by the radiotherapy.

However, we do know that after treatment, 80% will have developed a permanent change in their bowel habit compared to before radiotherapy. Many authors minimise the significance of this change although detailed study of long-term survivors suggests that their altered bowel habit affects quality of life in half of them^[4]. The commonest symptoms in these patients which generate referral to gastroenterologists in the UK include diarrhoea, rectal bleeding, bowel frequency, tenesmus and abdominal pain but other problematic issues include urgency, faecal incontinence, weight loss, non-obstructed vomiting, wind, need for nocturnal defecation and steatorrhoea^[3].

There are few data about the diagnostic significance of individual symptoms in these patients. Those that do exist suggest that the clinician should be wary about assuming the specific symptoms are due to a specific cause. Small studies have investigated why patients develop chronic diarrhoea after pelvic radiotherapy and have found a wide

variety of reasons which include altered transit, bile salt-induced diarrhoea, large bowel strictures, bacterial overgrowth, diverticular disease, recurrent disease and pelvic sepsis^[5]. Small endoscopic studies have commented that radiation-induced change is frequently not the pathological cause for lower gastrointestinal symptoms after radiotherapy^[6]. A questionnaire study suggests that radiation proctitis may present with five different patterns of symptoms^[7]. This raises another issue. Can you rely on questionnaires to measure side effects without also including appropriate investigations? If questionnaires are too detailed—like the comprehensive LENT SOM questionnaire—they become impractical for clinical practice. If they do not ask the right questions, they may not provide an adequate assessment. An example of the latter is the widely used Radiation Therapy Oncology Group toxicity scale which does not score new anorectal symptoms after treatment. Partly as a result, it is not widely appreciated that 20–30% of patients develop significant faecal incontinence after curative pelvic radiotherapy.

Thus, the radiologist who images these patients needs to be aware that they are not simply restaging the disease after treatment. They may see very serious complications such as stricture formation, enteric fistulae or secondary cancer which, together with transfusion dependent bleeding, have been estimated to occur in between 5 and 10%^[8,9]. They may see what is often thought of as minor changes of treatment which may or may not be causing their patient troublesome new bowel symptoms.

Now that effective treatments have been developed for cancer in the pelvis, in addition to refining those treatments, attention (and funding) needs to be applied to the investigation and therapy of the unintended consequences of that treatment. Although the evidence about which treatments are effective for radiation-induced bowel symptoms is poor^[10], this is not necessarily because treatments do not work. Rather, it is because few adequate studies have been performed. Indeed, there are a number of potential treatments which are yet to be tested which could ameliorate or reverse the underlying fibrotic and veno-occlusive changes induced by radiotherapy.

Radiologists need to continue to improve their techniques at distinguishing tumour recurrence from radiotherapy-induced changes to the gastrointestinal tract and its surrounding stroma. The next step, however, is to develop the ability to distinguish between changes which do and do not lead to symptoms. This requires much closer multidisciplinary working. It also requires an approach that looks for structural changes but also can assess functional change. Many patients will have marked structural change, but while significant structural change could mean that there has been a fault in the radiotherapy technique, it is much more likely to signify that effective treatment has been given which has cured the patient and this is simply the consequence. So our view is that structural change is largely unimportant unless it causes

symptoms, which in many patients it does not.

If function changes, however, that may be more important. Even when this change in bowel function does not impinge on quality of life, it may signify new or recurrent luminal neoplasia. Most of these neoplastic lesions develop in the distal colon or rectum but what is the best luminal technique to investigate the patient? Should it be endoscopy but with a relatively high risk of failure because of a fixed sigmoid? Or should the first investigation be virtual colonoscopy or barium enema? However, these investigations may also vex the radiologist in the sigmoid and as a result require the patient to undergo unnecessary additional endoscopy.

When we investigate the small bowel should we use a contrast follow through, a CT or small bowel MRI? Our practice with expert radiologists readily available has been to rely initially on a carefully conducted ultrasound of the bowel but in general use, many believe that radiologists have not yet adequately addressed issues of quality control with ultrasound.

And then there are specialist technologies. Does endoanal ultrasound add anything to the management of the faecally incontinent patient after radiotherapy? Perhaps PET scanning has something to offer here? Because these patients do not have cancer any more will they be disadvantaged when these modalities are requested?

Patients with bowel symptoms developing after radiotherapy will generate an increasing clinical burden in the future. The clinicians they see must not be intimidated by the fact that they have had cancer for which they have had complex but often curative treatments. The art in their management will lie in the judgement of whether changes detected by ever more sophisticated technology are of importance and are causing the symptoms. The wrong call may have dire consequences for the patient.

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