



## Radiation Induced Injury to the Colon and Rectum

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### At a Glance

- Radiation therapy can injure the colon and/or rectum.
- Diarrhea, urgency, incontinence, and rectal bleeding are common symptoms.
- Symptoms may occur weeks or years later.
- Several treatments are available.

Experiencing symptoms of diarrhea, urgency, incontinence, and rectal bleeding can be a significant source of stress that calls for consultation with a physician. Those individuals with a history of prior radiation therapy exposure need to disclose this to their doctor. Radiation induced symptoms must be considered as a potential source.

Radiation therapy has been used in the treatment of a variety of disorders. Examples include prostate, cervical, and rectal cancers. Special care is taken by the doctors who specialize in the treatment of cancer using radiation (radiation oncologists) to minimize radiation exposure. But in spite of their best efforts, significant rectal injury remains a far too common side-effect. Symptoms of radiation injury to the rectum (radiation proctitis) or the rectum and sigmoid colon (radiation proctosigmoiditis) are quite variable. They can occur weeks to years after radiation exposure. In this article I will highlight the different injury patterns and discuss available therapies.

### Acute Radiation Injury

Radiation injury can be divided into an acute and a chronic phase. An acute injury occurs within six weeks of radiation treatment. Symptoms associated with an acute injury include diarrhea, urgency, fecal incontinence, and rectal bleeding. The onset of these

symptoms can be attributed to the changes in the colon and rectum caused by radiation exposure. Symptoms may include acute inflammation, decreased mucus production, and accumulation of fluid beneath the intestinal lining (submucosal edema). Many patients will have resolution of these symptoms once the radiation exposure has ceased.

*Treatment* – If symptoms persist and are mild, antidiarrheals may be enough to manage them. Other treatments may be needed for those experiencing more severe symptoms. Several drug agents (e.g., sucralfate, misoprostol, steroids) have been studied in the treatment of acute radiation injury. These agents have had either limited success or have resulted in adverse outcomes.

*Prevention* – Two agents showing the greatest promise in preventing acute injury are amifostine and the 5 amino-salicylates (5 ASA). Amifostine is one protective agent, but its high cost will likely limit its use. In comparison, the 5-ASA agents are less expensive and have been shown to decrease symptoms associated with proctitis. Active delivery of the medication to the area of the rectum and last portion of the colon (rectosigmoid) is crucial as this is the location most often involved. Taking the agents orally is generally preferred to insertion of enemas or suppositories. Long-term follow-up studies are needed to assess whether the prevention of acute proctitis will decrease the risk of progression to chronic radiation injury.

### Chronic Radiation Injury

Chronic radiation proctitis is a common entity occurring in up to 75% of patients receiving pelvic radiation therapy. Symptoms are similar to those experienced in an acute injury with the exception of

bleeding being more of a problem. It is important, when these symptoms occur, to mention prior radiation exposure to the physician as symptoms may first occur many *years later*. The doctor will want to perform an examination and tests to make a diagnosis. A flexible sigmoidoscopy (examination of the inside of the sigmoid colon and rectum using a thin, lighted tube called an endoscope) will be sufficient in identifying the injured colon. However, in those persons having a family history of colon cancer, age greater than 50, or possible inflammatory bowel disease, it would be appropriate for the doctor to perform a full evaluation by colonoscopy (endoscopic exam to inspect the entire colon and rectum).

A doctor may find very subtle changes using an endoscopic approach, such as loss of normal folds in the colorectal lining (mucosa) or mild redness. More advanced or obvious findings may include ulcerations, easily damaged blood vessels, and/or abnormal narrowings (strictures). These visible endoscopic changes occur as a result of chronic inflammation, formation of scar-like tissue (fibrosis), and injury from low blood flow (ischemia). During the colonoscopy, the doctor may also decide to cautiously remove tissue for microscopic examination (biopsy). Once the diagnosis has been confirmed, it becomes important to discuss the available treatment options with the physician.

Other medical conditions such as diabetes and atherosclerosis (clogging and narrowing of arteries) affect the circulatory system and can increase the risk of chronic radiation injury. It is important to let the doctor know if these conditions are present.

**Treatment** – The 5-ASA agents used to treat acute radiation injury tend to be less effective when used in treating chronic changes. This is likely a result of the underlying changes due to scar tissue and ischemic injury. Sucralfate enemas have been shown to decrease the risk of bleeding and are generally well tolerated.

When bleeding is resistant to first line therapies, a doctor may try using a topical formaldehyde application to decrease bleeding. While relatively easy to apply in an office setting, it has been associated with adverse events (fistula formation and bowel perforation). Another method, argon plasma coagulation (APC), does not require contact with the tissue. During a colonoscopy, a probe is aimed at the injured blood vessel and a jet of electrically charged gas is emitted that coagulates the lesion and helps prevent further bleeding. Depending on the extent of bleeding, 3–4 applications may be required to achieve complete resolution. 5-ASA suppositories or steroid enemas can be used to speed-up healing of any ulcers that may form with the use of APC.

Surgery is only occasionally needed. It is reserved for severe cases that do not respond to other treatments because problems may arise due to poor healing where the colon is surgically rejoined. It is thought that the injured blood vessel supply network contributes to the poor healing.

### Summary

In summary, radiation proctitis/proctosigmoiditis is a common complication that occurs after radiation exposure to the pelvis. Recognition of this condition is important as symptoms can be quite bothersome and will often require treatment. Medical and endoscopic therapies have shown promise in alleviating the severity of symptoms associated with radiation injury.

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