



بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى

مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد



Introduction

Rectal cancer is defined as tumors arising within 15 cm of the anal verge. While histologically similar to cancers occurring at other sites in the colon (*Bray et al., 2018*). Several risk factors have been implicated in rectal tumor genesis including genetic factor (familial adenomatous polyposis), family history of cancer, age over 50 years, environmental factors as diet, obesity, bad habits as (smoking and alcohol consume) (*Nunez et al., 2017*).

Rectal cancer is one of one-third of all colorectal cancers and representing the cancer with the second highest incidence and the second cause of cancer death in the western society. Rectal cancer is treatable and curable if caught early. However, untreated rectal cancer can grow through the intestinal wall and spread to other parts of the body through the blood vessel or lymphatic system, such as to the liver and lungs, and become terminal (*Glynne-Jones et al., 2017*).

Treatment for rectal cancer depends on the stage of the tumor specifically the size and location of the tumor in the rectum as well as the degree of metastasis. Stage 0: this very early cancer is found only in the innermost lining of the rectum wall, Stage I: the tumor has spread beyond the inner lining but

remains within the rectum wall and has not spread to the lymph (*Ivanova et al., 2017&Chiorean et al., 2020*).

Stage II: the cancer extends through the thick outer muscle layer of the rectum but has not spread to the lymph nodes, Stage III: the cancer has spread outside the rectum to one or more lymph nodes, Stage IV: the cancer has spread to other parts of the body, such as the liver or lungs. The cancer may or may not be present in the lymph nodes (*Ivanova et al., 2017 & Chiorean et al., 2020*).

Rectal cancer treatment often involves a combination of therapies. The treatment of choice for rectal cancer is surgery, in addition to other modalities such as chemo and radiotherapy (neo adjuvant therapy) that aims to prevent recurrence and palliate symptoms. If surgery does not remove all of the primary cancer and metastasis occurs, then other forms of treatment are necessary mainly drug therapy and radiotherapy (adjuvant therapy) that aims to preventing the growth of the cancer, or at least slowing the growth down (*Cheng et al., 2018*).

Radiation treatment for rectal cancer is given by different methods as regards fractionation and total dose. Each dose that is delivered is termed a fraction. Radiotherapy causes fewer side effects as fatigue skin problems which can range from

redness to blistering, rectal irritation which can cause diarrhea, painful bowel movement, rectal bleeding and bladder irritation (*Nam et al., 2017*).

Nurses play important role in providing care for rectal cancer patients treated by radiotherapy (pre, during and post) exposure to radiation. This role consists of assessment, patient education, support and counseling and physical care. In recent years there has been increasing interest in the development of advanced practice nursing roles in this specialized area of oncology. Radiation oncology nurses need to be proactive in developing the knowledge and skills needed to meet the challenges of the future. Enhancing nurses' knowledge and practices help to prepare planned care plan that for improving patients' condition (*Shaukat et al., 2021*).

Nurses' performance guidelines can effectively reduce postoperative complications in patients with rectal cancer, within which evidence-based nursing (EBN) is a type of nursing model that has emerged in recent years with the main purpose of using the latest, best, and well-found scientific theories to provide care for patients (*Guo et al., 2020*).

Significance of the study

Rectal cancer continues to be one of the most common human malignancies, afflicting nearly one million individuals

worldwide every year. The incidence of rectal cancer in the European Union is 125 000 per year., i.e.35% of the total colorectal cancer incidence, reflecting 15–25 cases/100 000 population per year and is predicted to increase further in both genders (*Glynne-Jones et al., 2018*).

Colorectal cancer is the7th commonest cancer in Egypt, representing 3.47% of male cancers and 3% of female cancers. The estimated number of colorectal cancer patients in 2015 was more than three thousand (*Metwally et al., 2018*). According to the statistical records at Qena University hospital, the total admission number of patients with cancer admitted to radiological department during 2020-2021 were 300, 50 of them diagnosed with rectal cancer which representing 16.66 % .Therefore, developing nurses' performance guidelines for patients with rectal cancer undergoing radiotherapy are more important for improving quality of patients' care and decrease cost of treatment.

Aim of the Study

The Aim of this study is to develop nurses' performance guidelines for patients with rectal cancer undergoing radiotherapy.

This aim was achieved through the following:

- Assessing knowledge and practices of nurses caring for patients with rectal cancer undergoing radiotherapy.
- Developing nurses' performance guidelines for patients with rectal cancer undergoing radiotherapy.

Research question:

The current study answered the following questions:

- What are the knowledge and practices of nurses caring for patients with rectal cancer undergoing radiotherapy?

Anatomy and Physiology of rectum

The rectum and anal canal are the terminal parts of the large bowel. The rectum has a length of 15 cm and follows the pelvic colon, from the rectal-sigmoid junction, at the third sacral level, until the recto-anal verge. Anatomically the rectum is composed of two portions separated by the insertion of the levator ani muscle into the rectal wall: the rectal ampulla placed in the small pelvis and the anal canal located in the rear perineum (*Dupont et al., 2020*).

The rectum shows two curvatures: the first is the sacral curvature situated in front of the anterior sacrum and coccyx, in anterior concavity. The second curvature is the perineal curvature in anterior convexity, alongside prostate apex in men and middle part of vagina in women. In addition to these curves, there are also two flexuositities on the coronal plane, one convex on the right side and one on the left side, varying depending on the rectal distention. When the organ is distended, it shows four walls, front side, rear, and two lateral sides, which tend to droop in conditions of vacuity. (*Lee & Kim, 2018*).

The rectum can be divided into a peritoneal part and a sub peritoneal part, with different relationships depending on

the sex. In males, the portion above the peritoneal part corresponds to the rectovesical pouch and is related to intestinal loops, and the sub peritoneal part is related to the bladder trigone, the prostate rear wall, the seminal vessel, and the seminal vesicles. In females, the supra peritoneal part walls toward the rectum-uterine pouch, and the peritoneal part is related to the posterior wall of the vagina by which is separated through the rectovaginal septum (**Marecik et al., 2016 & Ghareeb et al., 2020**).

The posterior wall, in both sexes, is separated from the spine by the retro rectal space filled by fibro-adipose material, through which the middle sacral artery runs ending lower with the coccygeal glomus. Finally, the two side walls lean against the walls of the small pelvis (**Huang et al., 2020**). The perineal portion of the rectum is related to nearby organs, according to sex: in men the rectum-urethral trigonum separates from the prostate apex, urethra, and urethral bulb glands; in women the rectovaginal trigonum is interposed between rectum and rear wall of the vagina. The inner surface of the organ presents transverse folds, corresponding to the grooves on the outer surface and longitudinal pleats disappearing in case of vacuity (**Halleran et al., 2019**).

Two inches above the anal orifice, the inner rectum surface lifts in columns that are 5–10 longitudinal pleats presenting an inferior flared base and ending thinner after about 1 cm distance. Among the bases of the anal columns, cross pleats are found called semilunar valves creating the pectineal line, irregular and with circular course. The anal orifice is located approximately 3 cm in front of the coccyx, in the posterior perineum, and is the external outlet of the anal canal (*Nikolouzakis et al., 2019*).

The rectal wall consists of mucosal, submucosal, inner circular, and outer longitudinal muscular layers. There is no serosal layer in the rectum nor haustra which are present in the proximal colon. Folds of the rectal wall are seen endoscopically and are called Valves of Houston that serve no physiologic function but are useful as landmarks for endoscopy (*Tanaka et al., 2019*).

There are typically three valves and their location within the rectum can be variable. The upper valve is usually found on the left side of the rectum 8–16 cm from the anal verge. The middle valve is typically on the right side of the rectum 7–12 cm and is at the level of the peritoneal reflection. The

lower valve is located in the left side 5–10 cm from the anal verge (*Tanaka et al., 2019*).

The upper side of rectal tunica mucosa is cylindrical and tends to become cuboidal at the bottom; this epithelium continues until the upper third of the anal canal and at the level of the dentate line changes irregularly, becoming stratified squamous epithelium and covering all structures of the anal canal. The squamous stratified epithelium, beneath the hemorrhoidal ring, shows signs of keratinized layer together with hairs, sebaceous glands, and circumanal glands. The submucosa tunica placed in the ring hemorrhoidal area hosts the hemorrhoidal plexus (*Kelley et al., 2019*).

The anal canal is the terminal structure of the gastrointestinal tract. The surgical anal canal extends from the proximal internal anal sphincter to the anal verge and is approximately 4 cm in length. The internal anal sphincter, external anal sphincter, and levator ani make up the anal sphincter complex and are vital for maintenance of fecal continence. The external anal sphincter is skeletal muscle innervated by branches of the pudendal nerve and the perineal branch of S4. The external anal sphincter too is contracted at rest but the external anal sphincter is a

voluntary muscle which can be contracted further if necessary (**Fig. 1.**) (*La Torre et al., 2017*).

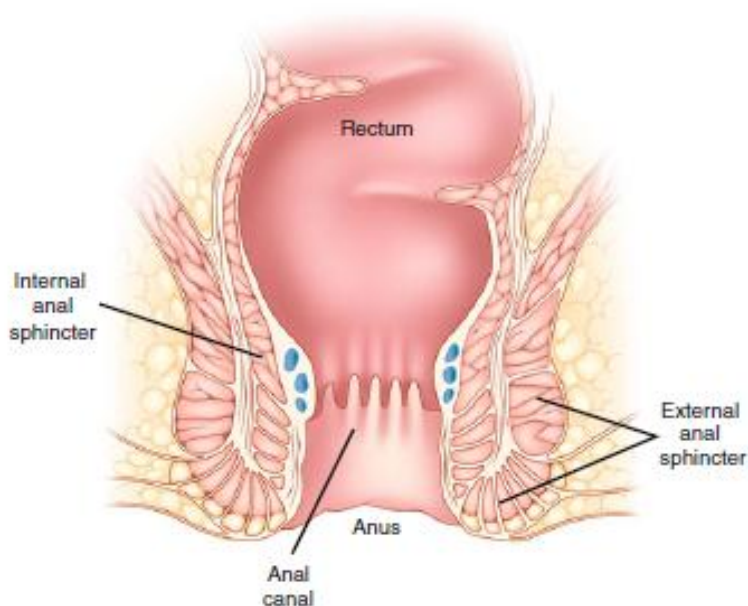


Figure (1): Anatomy of rectum. **Quoted from:**
La Torre F, Coletta D, Costanzo F, Iaquinandi F &Velluti F.(2017):
Anorectal Anatomy and Physiology. S.K. Doumouchtsis, Childbirth
Trauma, London. (1) PP;16-18.

Definition of rectal cancer

Rectal cancer is one of the frequent human malignant neoplasms and the second most common cancer in large intestine. Considering the different embryonic origin of the colon and the rectum, cancers arising from these two locations of the large bowel have several different distinctive

features. The colon is arising from the midgut and the rectum from the hindgut (*Julião et al., 2017*).

Pathophysiology of rectal cancer

Most rectal cancers start as a growth on the inner lining of the colon or rectum. These growths are called polyps. Some types of polyps can change into cancer over time, but not all polyps become cancer. The chance of a polyp turning into cancer depends on the type of polyp. There are different types of polyps, adenomatous polyps (adenomas), hyperplastic polyps and inflammatory polyps, sessile serrated polyps (SSP) and traditional serrated adenomas (TSA) (*Bray et al., 2017*).

Adenomatous polyps (adenomas): these polyps sometimes change into cancer. Because of these, adenomas are called a pre-cancerous condition. The 3 types of adenomas are tubular, villous, and tubulovillous. Hyperplastic polyps and inflammatory polyps: These polyps are more common, but in general these polyps are not pre-cancerous. Some people with large (more than 1cm) hyperplastic polyps might need colorectal cancer screening with colonoscopy more often. SSP and TSA: these polyps are often treated like adenomas because SSP and TSA have a

higher risk of colorectal cancer **figure (2)**, (*Korphaisarn et al., 2019*).



Figure (2): Sessile serrated polyps. **Quoted from:**

Korphaisarn, K., Morris, V., Davis, J.S. et al.2019: Signet ring cell colorectal cancer: genomic insights into a rare subpopulation of colorectal adenocarcinoma. *Br J Cancer.*; 121, (1): 505–510.
[https:// doi. org/ 10. 1038/ s41416- 019-0548-9](https://doi.org/10.1038/s41416-019-0548-9).

Cancer can grow into the wall of rectum over time, when it forms in a polyp, The wall of the rectum is made up of many layers. Rectal cancer starts in the innermost layer (the mucosa) and can grow outward through some or all of the other layers. When cancer cells are in the wall, the cancer cells can then grow into blood vessels or lymph vessels (tiny channels that carry away waste and fluid). From there, cancer cells can travel to nearby lymph nodes or to distant parts of the body. The stage (extent of spread) of a rectal cancer

depends on how deeply cancer grows into the wall and if cancer has spread outside the rectum (*Libutti et al., 2019*).

Stages of rectal cancer

Staging determines how advanced the cancer is and whether cancer has spread to other parts of the body. Staging helps to identify the most appropriate treatment options for the patient. the United institute Committee on Cancer (UICC) has introduced the tumor-node-metastasis (TNM) classification has largely replaced the Dukes' staging system, although many pathologists still report both (*Hashiguchi et al., 2020*).

Standard TNM classification of rectal cancer divided into: Primary tumor (T) which consist of, **TX** (primary tumor cannot be assessed), **T0** (no evidence of primary tumor), **Tis** (carcinoma in situ), **T1** (tumor invades submucosa), **T2** (tumor invades muscularis propria), **T3** (tumor invades through muscularis propria into the subserosa), **T4** (tumor directly invades other structures and/or perforates visceral peritoneum) (*Horvat et al., 2019*).

Regional lymph nodes (**N**) consist of; **NX** (regional nodes cannot be assessed), **N0** (no node metastases), **N1** (metastases in 1–3 regional nodes), **N2** (metastases in four or

more nodes). Distant metastases (**M**) consist of, **MX** (distant metastases cannot be assessed), **M0** (no distant metastases), **M1** (distant metastases) **Figure (3)** (*Li, et al., 2016*).

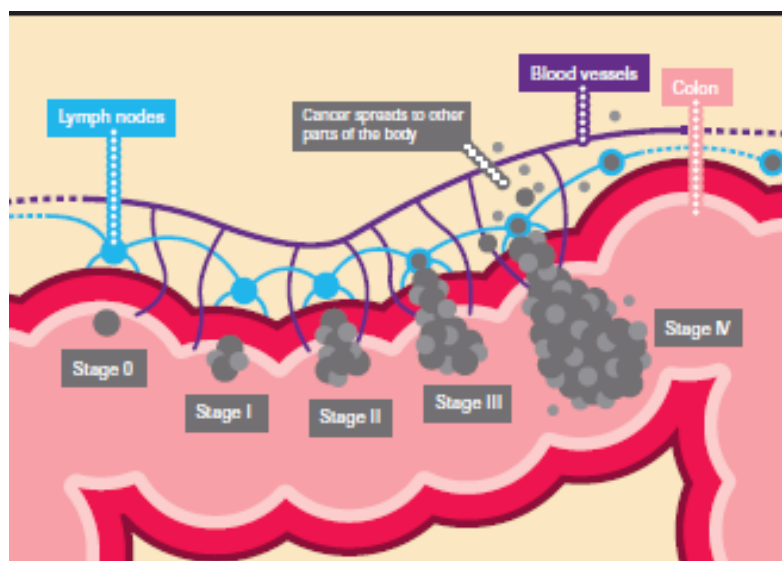


Figure (3): Stages of rectal cancer .*Quoted from :*
Li, J ; YI, C ; Hu, Y ; Li, J; Ying, Y; Zhang, S; Zheng, S; Ding, K.
(2016) : TNM Staging of Colorectal Cancer Should be Reconsidered
According to Weighting of the T Stage, Medicine: Vol (95) - Issue 6 - p
e2711 doi: 10.1097/MD.00000000000002711

Etiology and risk factor of rectal Cancer

Although the specific cause of rectal cancer is unknown, a number of risk factors have been identified such as; modifiable and non -modifiable risk factors (*Rawla et al., 2019*).