**CASE STUDY**

# MANAGEMENT OF SIGNET-RING CELL CARCINOMA OF THE RECTUM: A CASE STUDY

**Majed Alamri[1], Helen Cecily[2]**

1 Assistant professor of nursing, College of Applied Medical Sciences
Majmaah University

2 Assistant professor of nursing, College of Applied Medical Sciences
Majmaah University

*Received on: 6th November, 2016; Accepted on: 21th Novemberl,2016*

Correspondind Author:
Dr. Majed Sulaiman Alamri
email: m.alamri@mu.edu.sa

## Abstract

Background: Colorectal cancer is the third most commonly diagnosed cancer in the world. Primary signet-ring cell carcinoma of the colon and rectum (PSRCCR) is a rare form of adenocarcinoma, with a reported incidence of less than 1%. Because symptoms of PSRCCR often develop late, it usually has a poor prognosis. Case Presentation: A 44-year-old male presented to his general practitioner with complaints of inadequate evacuation of stool, abdominal bloating and irregular bowel movements in the last 6 months and bleeding per rectum in the past 2 weeks. Colonoscopy showed growth in the rectum; hence, a biopsy and magnetic resonance imaging (MRI) of the pelvis were done. Discussion: The patient received short course chemotherapy followed by low anterior resection with transverse loop colostomy. Out of 17 resected mesorectal lymph nodes, 7 nodes were positive. Due to the patient's young age and having locally advanced cancer with aggressive histology, adjuvant chemotherapy was started with intravenous (IV) oxaliplatin and oral capecitabine to prevent recurrence and improve overall survival. Patient completed 6 cycles of adjuvant therapy, after which end-to-end anastomosis was done, and the patient remained disease-free. Conclusion: Patients with locally advanced growth of rectal signet-ring cell carcinoma (SRCC) should be offered preoperative short-course radiotherapy

## الملخص

خلفية: سرطان القولون والمستقيم هو ثالث أكثر أنواع السرطان تشخيصا في العالم.سرطان الخاتم الدائري للقولون والمستقيم (PSRCCR) هو شكل نادر من السرطانات الغدية، ونسبة حدوثه أقل من ١٪ . لأن أعراض PSRCCR غالبا ما تظهر في وقت متأخر، فإنه عادة ما يكون له مضاعفات خطيرة. عرض الحالة: شاب يبلغ من العمر ٤٤ عاما يشتكي من الإمساك وصعوبة الاخراج، مع انتفاخ في البطن وعدم انتظام حركة الامعاء في الستة أشهر الماضية، ونزيف في المستقيم في الاسبوعين الماضية. أظهر فحص القولون بالمنظار نمو في المستقيم. وبالتالي، تم القيام بعمل خزعة لأخذ عينة والتصوير بالرنين المغناطيسي.المناقشة:تم اعطاءالمريض جرعات من العلاج الكيميائي القصير ومن ثم اجرى عملية استئصال للورم في المستقيم وتبين ان هنالك ٧ نقاط إيجابية. نظرا لصغر سن المريض ووجود السرطان في مرحله متقدمة بدأ المريض العلاج الكيميائي عن طريق الفم والوريد لمنع تكرار حدوث السرطان وزيادة فرصة البقاء على قيد الحياة. اعطي المريض ستة دورات من العلاج الكيماوي بعد اجراء

with curative intent. Though the patient's cancer was in the T3N2b stage, he responded well to treatment. The chemotherapy nurse plays a significant role to ensure patients have the basic knowledge necessary to decide about treatment options.
Key Words: Colorectal adenocarcinoma, Signet-ring cell carcinoma, Short course radiation therapy, Adjuvant chemotherapy, Low anterior resection.

العملية الجراحية والمريض حاليا خاليا من المرض. الخلاصة: المرضى الذين يعانون من سرطان المستقيم ينبغي أن يقدم لهم علاج كيماوي قبل الجراحة. على الرغم من أن سرطان المريض في مرحلة T3n2b، فقد استجاب بشكل جيد للعلاج. ممرضة الاورام تلعب دورا هاما لضمان ان المرضى لديهم المعرفة الأساسية اللازمة لاتخاذ قرار حول خيارات العلاج.

## Introduction

Worldwide, colorectal cancer is the third most prevalent cancer in both men and women [1]. In 2012, an estimated 1.36 million new cases of colorectal cancer and 694,000 deaths were reported in the United States. In 2016, 95,270 cases of colon cancer and 39,220 cases of rectal cancer are expected to be diagnosed [2]. From 2008 to 2012, incidence rates decreased by 4.5% annually among patients older than 50 years but increased by 1.8% per year among patients younger than 50 years. Reasons for the increase in young adults, which has been consistent since at least 1992, are unknown [2].

Rectal carcinoma is broadly classified into two types: epithelial and nonepithelial tumors. Adenocarcinomas account for most of the rectal tumors in the United States [1]. One of the histologic subtypes of colorectal adenocarcinoma (CRC) is signet-ring cell carcinoma (SRCC), which has a distinct tumor biology. It is very rare to diagnose primary SRCC at an early stage as most cases are detected at an advanced stage. Therefore, overall prognosis of SRCC is poor[3].

## Case Description

Patient History: The subject chosen in this case study is a 44-years-old Asian male, born in India and residing in Majmaah, Saudi Arabia, when he was diagnosed with this problem. He had complaints of inadequate evacuation of stool, abdominal bloating and irregular bowel movements in the last 6 months and bleeding from the rectum in the past 2 weeks. When he developed this problem, he consulted a general practitioner in a local government hospital under the auspices of the Ministry of Health (MOH) in Saudi Arabia. Initially, he was diagnosed as having internal hemorrhoids, and was treated for the same, with no positive results. After 2 weeks, he consulted a Gastroenterologist from the same hospital. Digital rectal examination was done and the patient was advised to have a colonoscopy, after which he was diagnosed to have a growth in the rectum at 10 cm from anal verge (Fig.1). The growth was biopsied and samples sent to the pathology lab, where it a malignancy was confirmed. The then patient decided to seek further treatment at an advanced cancer center.

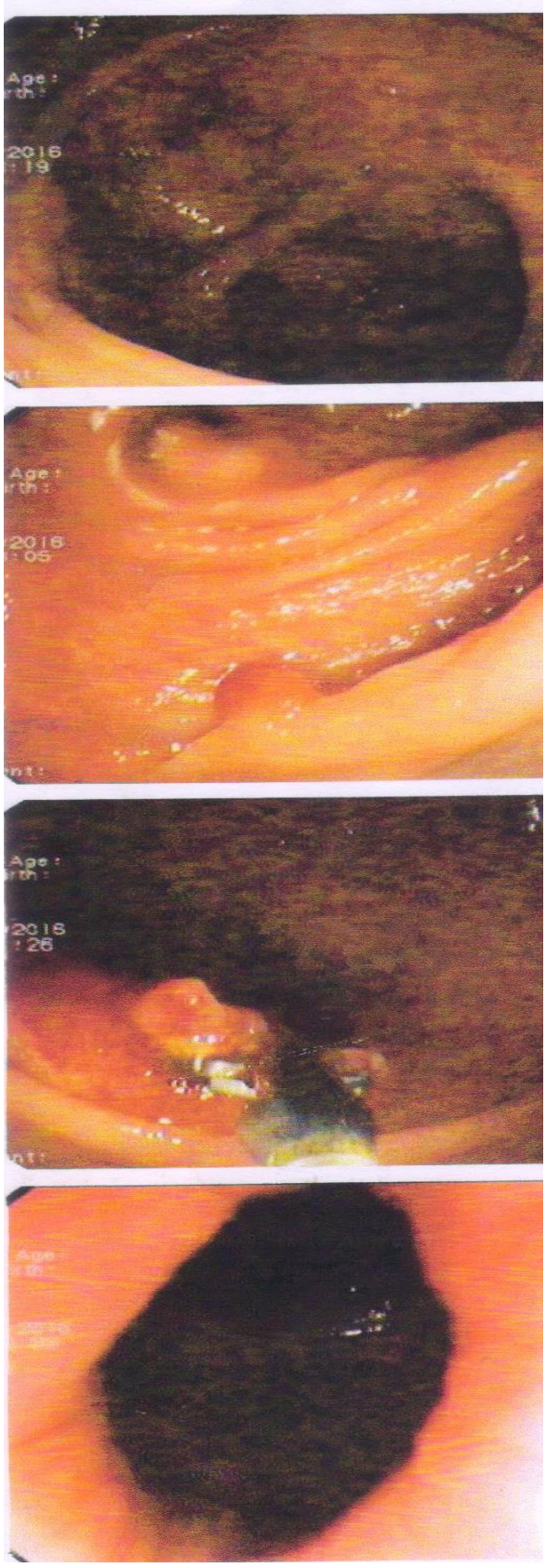


**Fig. 1.**

`At a cancer institute, the biopsy slides and blocks were examined again in the histopathology laboratory and the results were confirmed with the same findings of signet-ring cell carcinoma. Consequently, the patient was directed to go for further blood work, including hemoglobin (Hb), total count (TC), erythrocyte sedimentation rate (ESR), differential count (DC), lipid profile, liver function test, blood carcinogenic embryonic antigen (CEA), X-ray of the chest and MRI to determine the stage of cancer. Based on the MRI result, the patient was diagnosed as having stage III rectal carcinoma mid and upper rectum T2 N0/1 M0.

**Results of the Physical Exam:**

P/A – Soft, No mass palpable, No evidence of free fluid. No inguinal nodes clinically palpable. P/R – Lower border of ulcerated growth felt at 8 cm from the anal verge, upper limit not felt.

Laboratory and Other Results: CEA – 3.2 ng/mL, Hb – 15.5 mgs/dL, WBC Total count – 6000/cumm.

Colonoscopy – Ulcerated growth at 10 cm from the anal verge, biopsies taken and small polyp at 20 cm (benign looking). Biopsy – Poorly differentiated carcinoma with signet-ring cell features. MRI Pelvis – Irregular growth involving the mid and upper rectum starting 8 cm from the anal verge. The length of the lesion is 4 cm. The lesion predominantly involves the right lateral wall with a maximum wall thickness of 1.9 cm. Minimal perirectal fat stranding noted

on right side measuring up to 5 mm with a desmoplastic reaction in the mesorectal fat. Furthermore, 2-3 tiny mesorectal nodes are seen on right side measuring up to 5 mm close to mesorectal fascia showing faint diffusion restriction. Treatment plan: The patient was given a short course of chemotherapy followed by surgery as there was not much lymph node involvement. Low anterior resection with para-abdominal colostomy and colostomy closure (end-to-end anastomosis) was planned tentatively after 12 weeks.

**Primary Outcomes of Treatment**

Patient was treated for a 5-day period with 6Mv X-ray beam therapy using conventional technique and the total dose 20 Gy. The patient developed a mild increas in frequency of bowel elimination 3-4 times a day and burning sensation during micturition. The patient tolerated treatment well and had no other complaints.

As per the 5-day treatment plan, immediately following radiation therapy, the patient was admitted for surgery. Under general anesthesia, he underwent low anterior resection with total mesorectal excision (TME) with transverse loop colostomy (temporary colostomy). The entire tumor was removed and sent to the histopathology lab. The patient was in the recovery room for about 4 hours and then shifted to the postoperative ward. Epidural analgesia was given for about 3 days postoperatively. Also, the patient was on IV fluids and IV antibiotics, anti-emetics and H2 receptor antagonists. Once the colostomy matured, it was attached with the colostomy bag and sips of oral fluids were started gradually from the 2ndpostoperative day. The patient was transferred to the postsurgical ward on the 6th postop day. Drainage tubes were removed on the 8thday postop and the abdominal wound staple pins were removed on the 9th postop day. His postoperative period was uneventful; the patient was discharged on the 10th postop day as per the plan.

It was decided to do end-to-end anastomosis after 12 weeks. Unfortunately during the surgery a locally advanced cancer was identified with the involvement of 7/17 lymph nodes. Hence, after surgery;it was determined the patient had stage T3N2b and adjuvant chemotherapy was recommended. The patient was to receive six cycles of chemotherapy with the interval of 21 days to prevent recurrence and metastasis. In each cycle, the patient received oxaliplatin 150 mg intravenously, followed by capecitabine 500 mg orally for 14 days.

## Discussion

Colorectal cancer is the third most commonly diagnosed cancer and the third leading cause of cancer death in the world [2]. Cancer group estimation from 2010 to 2020, shows rectal cancer as the sixth most common digestive tract cancer in India. Primary SRCC is a tumor that occurs mainly in the stomach, and less commonly in the breast, gallbladder, bladder, and pancreas [4-5]. Primary SRCC of the colon and rectum (PSRCCR) is a rare type of cancer, with a reported incidence of

less than 1%. It is frequently diagnosed at an advanced stage with positive lymph nodes and metastases because typically symptoms develop late, which results in poor prognosis [3,6,7].

Age 50 or older with a family history of cancer can affect the risk of rectal cancer. Being overweight, consuming a diet high in red meat, heavy alcohol use, smoking, and a personal history of inflammatory bowel disease are the risk factors for rectal carcinoma [4]. Signs of rectal cancer include a change in bowel habits, blood in the stool, frequent gas pains, bloating, fullness, cramps, change in appetite, weight loss for no known reason, and fatigue [1].

Furthermore, it mainly affects young adults [6,7]. Histologically, PSRCCR shows typical features that differentiate the cells from routine adenocarcinoma of the colon. The signet-ring malignant cells are seen as a cluster of isolated cells floating in abundant extracellular mucin pools [8,9].

Various modalities of treatment are available for cancer. But developing individualized treatment plans to fit each patient's distinct needs is most important. Surgery with total mesorectal excision is the treatment of choice for patients with locally advanced rectal cancer [10]. The treatment options for the patient in this case study is atypical compared to the cases reported in the literature [10-12]. Unlike other stage III rectal cancers, this patient was treated with preoperative short course radiation therapy followed by surgery, low anterior resection with mesorectal excision. Though the patient had locally advanced rectal cancer (T3N2b), he responded well to this treatment, which is incongruent with the results of Swedish Rectal Cancer Trial conducted by Theodore and Harvey [11].

Treatment of colorectal cancer depends on its type and stage. Surgery, radiation therapy, chemotherapy and targeted therapy are the standard ways of treating this disease. Stage 0 cancer needs only excision of the tumor; stage I is treated with surgery and chemoradiation therapy if needed. Additionally, stage II and III rectal cancers are treated with surgery, preoperative chemoradiation therapy or short-course preoperative radiation therapy and postoperative chemoradiation therapy, while stage IV cancer is treated with palliative therapy [1,2].

Furthermore, patients with a clinically resectable rectum receiving short-course radiation before the operation had better local control, as well as a longer overall survival duration, than those who did not receive radiation therapy preoperatively [11].

Most colorectal cancer patients receive long course neo-adjuvant chemo-radiation therapy (NACRT) before surgery to help shrink tumors, so the tumors are easily removed by surgery. Though down-staging is achieved in the majority of tumors receiving long course NACRT the extent of down-staging and survival may vary from patient to patient. Many factors in the literature predict the response to NACRT, of which advanced

stage at presentation is the most important [12]. At the same time, NACRT correlates more closely with higher acute toxicity than short-course radiation [13]. As the patient in this case study was free from acute toxicity, he was able to withstand the effects of anesthesia and surgery. Apart from his young age, various other factors such as his leukocyte count, hemoglobin level, and good general health favored the surgical outcome.

Disregarding the tumor biology and the prognosis of SRCC, 7/17 nodes were identified as positive at the time of surgery. Hence adjuvant chemotherapy that included IV oxaliplatin with oral capecitabine was initiated a month after surgery to prevent recurrence and metastasis. Oxaliplatin is a platinum-containing compound, which belongs to the large group of alkylating agents, whereas capecitabine is an antimetabolite. These drugs help ensure any cancer cells remaining after surgery are eliminated [13]. Six cycles of therapy were administered with the duration of 21 days, after which end-to-end anostamosis was done.

To date, the patient is cancer free. His prognosis was congruent with the findings of various trials [10-11]. Both studies recommend that close follow-up and intensified adjuvant therapy improves survival for patients with stage III SRCC.Postoperative adjuvant chemotherapy, which research shows results in a 25%-30% reduction in future metastases, is an accepted component of multimodal therapy [12].

## Nursing Management

Nursing care plays a vital role caring for patients with rectal carcinoma during the various modalities of treatment such as radiation therapy, surgery and postoperative chemotherapy. The patient, in this case, was prepared both physically and psychologically before these treatments. Informed consent was obtained, explaining the nature of treatments, benefits and their short-and long-term side effects.

Nursing monitored the patient for adverse effects such as skin changes, blanching, erythema, desquamation, sloughing, ulcerations of mucous membranes, nausea and vomiting, diarrhea, burning micturition or gastrointestinal bleeding, as well as white blood cell and platelet counts for significant decreases [14].

**Preliminary education:** Part of the patient's care included his and his family's education about radiation therapy and the following points:

Care of the skin at the radiation site. Instructions were specific to wash the skin marked as the radiation site with plain water only, not with soap; do not apply any deodorant or lotions, medications, perfume, or talcum powder to the site during the treatment period.

**`Do not wash off the treatment marks.**

Do not rub, scratch, or scrub treated skin areas. Inspect the skin for damage or remarkable changes, and report these to the radiologist.

Wear loose, soft clothing over the treated area. Protect skin from sun exposure during treatment.

Rest, drink more fluids and eat a balanced diet. Preoperative care: After the patient was cleared by a cardiologist and an anesthetist for surgery, he was admitted to the hospital 2 days before surgery. Apart from routine preoperative preparations such as lab tests, fasting, skin preparation, laxatives and enemas, the patient was given whole bowel irrigation with two liters of Peglec solution to clear the bowel. To relieve his fear and anxiety, the patient met the stoma and colostomy nurse since he would have a temporary colostomy. The patient received preoperative health teaching about postoperative wound and drainage tube care, colostomy care, dietary restrictions, and early ambulation and pain control measures (epidural analgesia), as well as education froma physiotherapist on use of the spirometer to prevent pulmonary complications postoperatively.

**Postoperative care:** After colon resection, the patient was taken to the post-anesthesia care unit and was monitored closely by the nurses till anesthesia wore off. After vital signs were stable and the patient was awake and oriented, he was transferred to the postoperative ward. The patient was on IV fluids until the colon recovered sufficiently for food and fluid to be taken by mouth. Analgesics were administered intravenously for pain management. Nothing was allowed by mouth until it was certain that normal colon function has resumed; typically the passage of stool is an indication the colon is healing. After colon function returned, the patient was given clear liquids, and the nasogastric tube was removed. Once clear liquids were tolerated, the diet was slowly advanced until the patient was eating solid foods. The day after surgery, the patient was encouraged and assisted in moving around to stimulate bowel function and enhance blood circulation. Drainage tubes and the urinary catheter were removed on the eighth post operative day and abdominal wound staple pins were removed the next day. Postoperative period was uneventful, and the patient was discharged on the tenth post op day as per the plan.

Nursing care during adjuvant chemotherapy: Chemotherapy nurses ensure the patient has the basic knowledge to decide about treatment options. Accordingly, appropriate up-to-date information regarding the aim of the treatment, side effects, and outcomes were given to the patient. Clinical review and nursing assessment were done before each cycle of chemotherapy to ensure no toxicities so the patient was fit to continue. During chemotherapy, nurses assessed vein fragility to ensure there were no signs of extravasation [15].

As important as the physical assessment, is the nursing role in assessing the psychological impact of a diagnosis of cancer; and educating the patient on how to cope with chemotherapy. Body image changes such as weight loss, hair loss, skin texture, fatigue, and stoma management confound the psychological distress. Holistic needs assessment tools were used to assess the general well-being of the patient as well as the toxicities.

## CONCLUSION

Primary SRCC is a rare condition based on clinical and pathological features. This case study demonstrates exceptional management of primary SRCC of the rectum. Treatment of locally advanced primary and recurrent SRCC of the rectum with preoperative short-course radiotherapy followed by excision is associated with good prognosis. To date there is no evidence of recurrent disease in the patient. Finally, a patient with locally advanced SRCC should be offered preoperative short-course radiotherapy.

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