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Case Report

Fertility preservation in a young female with rectal mucinous adenocarcinoma and tailgut cyst: a multidisciplinary case report

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ABSTRACT

Colorectal cancer (CRC) in women of reproductive age is rare, and its coexistence with congenital lesions such as tailgut cysts is exceptionally uncommon. Moreover, fertility preservation during multimodal oncologic therapy remains an evolving domain in young rectal cancer patients. We report a 22-year-old female, gravida 2 para 1, who presented with altered bowel habits. Imaging revealed an irregular rectal mass with posterior fat plane loss and a presacral cystic lesion suggestive of a tailgut cyst. Biopsy confirmed moderately differentiated mucinous adenocarcinoma of the rectum. Given the need for pelvic radiotherapy, ovarian transposition was performed to preserve fertility. The patient subsequently received 28 sessions of radiotherapy followed by six cycles of neoadjuvant CAPOX chemotherapy (capecitabine and oxaliplatin). Abdominoperineal resection was later performed, during which the presacral lesion was excised and confirmed histologically as a benign tailgut cyst. Post-treatment monitoring showed normalization of carcinoembryonic antigen (CEA) levels and no evidence of recurrence. This case highlights the importance of a multidisciplinary approach incorporating early diagnosis, fertility-preserving surgical strategies, and contemporary chemoradiation protocols. While ovarian transposition demonstrated preserved ovarian function, long-term follow-up remains crucial. The coexistence of a tailgut cyst and rectal adenocarcinoma in such a young patient raises potential embryological and oncogenic associations that merit further investigation. Fertility preservation should be an integral component of CRC management in young women. This case underscores the feasibility of successful oncologic and reproductive outcomes through personalized, multidisciplinary care.

Keywords: Second-trimester uterine rupture, Spontaneous rupture, Hemoperitoneum

INTRODUCTION

Rectal cancer tends to grow slowly and usually starts in the lining of the rectum. Most cases begin as adenomatous polyps, small clusters of abnormal cells that can turn cancerous over time, often taking 10 to 15 years to develop into full-blown cancer, Colorectal cancer (CRC) is a major health issue worldwide, and rectal cancer alone ranks eighth in global cancer cases, with about 729,833 reported in 2022 according to GLOBOCAN.[1,2] Asia experiences the highest number of cases, making up 57.2% of the total, or 417,357 cases. Contributing factors include obesity, diabetes, smoking, and diets high in red and processed meat, each adding about a 20% increased risk.[3]

CRC during pregnancy is uncommon, with rectal cancers being rarer than colon malignancies. A systematic review by Pellino et al. analyzed 79 studies, identifying 119 cases of CRC in pregnancy, equating to an incidence of about 0.002% (2 per 100,000 pregnancies). Of these, 53.4% involved the colon, while 44% affected the rectum. The case highlights the rarity of the condition and suggests that rectal cancer may be reported more frequently due to earlier symptom detection.[4]

CRC presents with bleeding from the rectum, anemia, nausea, vomiting, constipation, and abdominal pain. During pregnancy, constipation and abdominal pain are common and usually linked to the growing uterus pressing on the bowels or slower digestion. Bleeding from the rectum at this time is often caused by harmless issues like hemorrhoids or small tears near the anus. While gaining weight is a normal part of pregnancy, it's not unusual for some women to lose weight early on. Since weight loss is also a possible sign of cancer, this overlap can delay recognizing rectal cancer in pregnant women.[5]

CASE REPORT

We presented a case of 22-year-old female, gravida 2 para 1+0, whose last child was born 5 years back through spontaneous vaginal delivery, presented with complaints of altered bowel habits. On digital rectal examination, a firm mass was palpated. Initial laboratory investigations revealed mild anemia with a hemoglobin level of 11.6 g/dL. The white blood cell count was 10.1×10^9/l, and the platelet count was 212×10^9/l. The complete blood count showed normochromic anisocytosis. Coagulation parameters were within normal limits with a prothrombin time (PT) of 9.8 seconds and an international normalized ratio (INR) of 0.9. Hepatitis screening was negative, with HBsAg <0.10 and anti-HCV at 0.13.

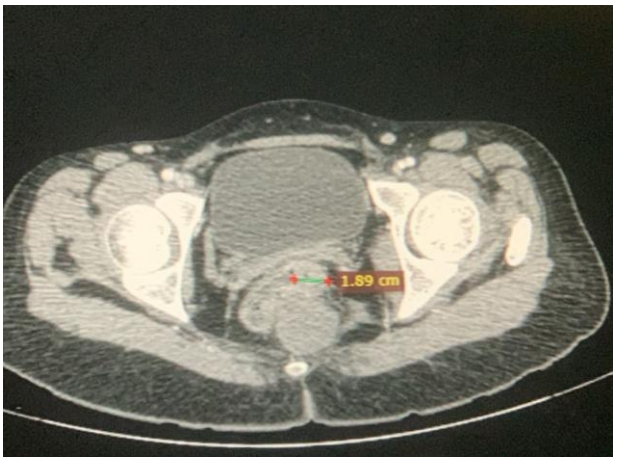

Figure 1: Pelvis CT scan (axial view).

A computed tomography (CT) scan of the abdomen and pelvis showed irregular circumferential thickening of the rectum with posterior loss of fat planes and a well-defined presacral cystic lesion measuring 1.89×3.90 cm, suggestive of a tailgut cyst, as shown in Figures 1 and 2.

Magnetic resonance imaging (MRI) of the pelvis further demonstrated a rectal mass infiltrating the posterior rectal wall and abutting a cystic presacral lesion closely related to the sacrum. Mesorectal lymphadenopathy was also noted. A biopsy of the rectal mass confirmed the diagnosis of moderately differentiated mucinous adenocarcinoma of the rectum.

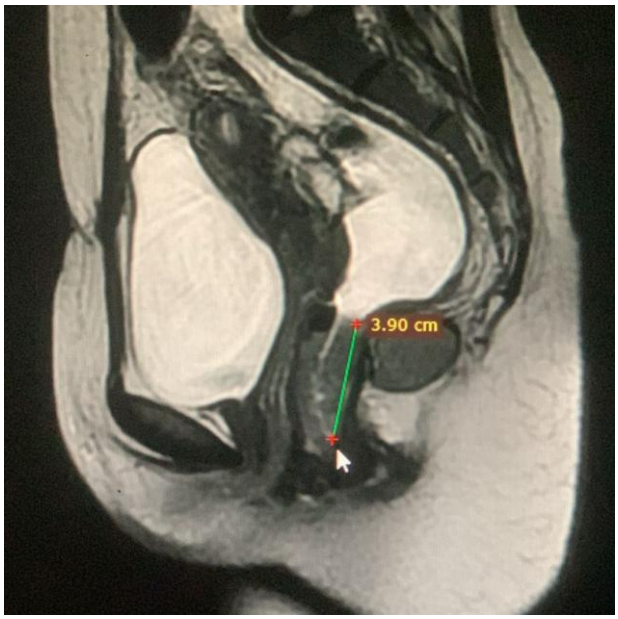

Figure 2: MRI (Midline Sagittal view, T2-weighted).

The woman had undergone ovarian transposition, which involved surgically moving the ovaries outside the radiation exposure field to maintain fertility before pelvic radiation therapy. The goal of this preventative measure was to reduce the gonadotoxic effects of scheduled pelvic radiotherapy.

She then received 28 sessions of pelvic radiotherapy between September 2, 2021, and October 8, 2021. The treatment was delivered using 16 MV energy photons, targeting the pelvis for local control of the primary malignancy.

By December 2021, follow-up laboratory testing showed an improvement in hemoglobin to 12.6 g/dl, with a slight decline in platelet count to 144×10^9/l. The white blood cell count remained stable at 6.6×10^9/l, and red cell morphology was normochromic and normocytic. Coagulation parameters continued to remain within the normal range, with a PT of 9.3 seconds (control: 10.5 seconds) and an INR of 0.88. Repeat hepatitis screening remained negative.

In early 2022, the patient started neoadjuvant chemotherapy with the CAPOX regimen (Capecitabine and Oxaliplatin), which is commonly used to treat

colorectal cancer. Capecitabine is an oral medication turned into 5-fluorouracil (5-FU) in the tumor, interfering with DNA production. Oxaliplatin, given through an IV, damages DNA and prevents cells from copying it. The treatment was given in 3-week cycles: oxaliplatin on day 1, followed by 14 days of capecitabine, and then a 7-day break.

A coagulation test in March 2022 showed normal results with a PT of 11.0 seconds and an INR of 1.05. In April 2022, tumor marker tests showed a CEA level of 2.94 ng/mL, slightly above the normal range for non-smokers, which is <3 ng/ml.

From June 30, 2022, to October 13, 2022, the patient completed six cycles of chemotherapy. Afterward, based on recommendations from a tumor board, she had an abdominoperineal resection (APR). During the surgery, a presacral lesion was found and removed, which turned out to be a tailgut cyst. Post-surgery tests confirmed that she had rectal adenocarcinoma.

After surgery, the patient was monitored closely, including regular checks of tumor markers. By November 2023, her CEA level had dropped to 1.08 ng/mL, indicating there was no sign of active cancer.

This case is notable for the rare combination of rectal adenocarcinoma in a young woman with a congenital tailgut cyst in the presacral area. The patient's clinical journey underscores the importance of early diagnosis, timely fertility-preserving intervention, multimodal therapy including chemoradiation and surgery, and long-term surveillance. The presence of a tailgut cyst in such a young patient raises questions about congenital anomalies potentially contributing to colorectal carcinogenesis. Moreover, the successful normalization of CEA levels post-treatment illustrates the value of this tumor marker in disease monitoring. A multidisciplinary and patient-centered approach was essential to achieving a favorable outcome.

DISCUSSION

Our case presents a rare occurrence of moderately differentiated mucinous CRC in a woman of reproductive age, with a coexisting tailgut cyst. The patient's young age, fertility preservation, and unusual tumor-cyst association make this case particularly noteworthy. Recent literature suggests malignant transformation rarely occurs.[6] Our patient's presentation differs notably as the adenocarcinoma arose from the rectal wall, while the adjacent tailgut cyst showed no malignant change, in contrast with most reported cases where malignancies originate from the cyst epithelium, mostly in middle-aged females.[6]

The approach to preserve fertility in this case represents an important clinical consideration. While ovarian transposition is well established in gynecological malignancies, its application in rectal cancer remains underreported.[7] This approach led to the successful preservation of ovarian function, which aligns with the reported success rate of approximately 65% in patients undergoing pelvic radiotherapy.[8] In contrast to the failure rate of 40% occurs when fertility preservation measures are not taken.[8] This aspect of the case highlights the growing importance of oncofertility considerations in the management of CRC patients of reproductive age, as a minimally invasive laparoscopic approach successfully preserved ovarian function in a young female.[9]

The chemotherapy regimen used on this patient provides a valuable insight into contemporary rectal cancer management. The excellent response to the neoadjuvant CAPOX regimen, post-abdominoperineal resection, supports the efficacy of these drugs in young patients.[10] This is consistent with recent meta-analyses demonstrating favourable outcomes.[11] Although it is effective, the CAPOX regimen is also being linked with a higher side effect profile, leading to lower completion rates in comparison with other available regimens, suggesting careful need for monitoring and comparison with other regimens.[12] The diagnostic approach in this case also merits discussion, as it demonstrates the value of high-resolution MRI in differentiating between primary rectal malignancies and congenital prescaral lesions, unlike previous misdiagnosed cases of tailgut cysts.[13]

This case contributes to the current literature by presenting that tailgut cysts may coexist with primary CRC without direct malignant transformation. Moreover, it provides supporting evidence for fertility preservation measures in young rectal cancer patients.[3,7] It also raises important questions regarding potential embryological links between congenital presacral lesions and colorectal carcinogenesis, warranting further research. Thirdly, it also adds to the growing body of evidence supporting CAPOX efficacy in such patients.[11]

The favourable outcome achieved in this patient underscores the importance of a comprehensive, multidisciplinary approach that addresses both oncological control and quality-of-life considerations.[14] This case is an example of how integrating advanced imaging techniques, fertility preservation strategies, and modern chemotherapy regimens, can lead to optimal outcomes in young CRC patients.[8,10,13] These findings are particularly relevant given the increasing incidence of CRC in young adults and the growing emphasis on personalised cancer care.[15]

CONCLUSION

This case shows a rare instance of rectal mucinous adenocarcinoma in a young woman with an accompanying tailgut cyst, treated successfully through multidisciplinary management. The application of the CAPOX regimen had a good response, but emphasizes the need for more documented, age-related evidence and guidelines because of its toxicity profile. While ovarian transposition was

utilized for fertility preservation, its variable success highlights the importance of offering alternative options such as oocyte or embryo cryopreservation, freezing of ovarian tissue, and GnRH analogues. There should be extensive oncofertility planning and customized cancer treatment since the incidence of colorectal cancer rises in young adults.).

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