

Does Appendectomy Increase the Risk of Colorectal Cancer?

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Background: Colorectal cancer rank third of the most common cancers worldwide with increasing rate in many societies including the middle east countries. Many theories stated that there is a relation between colorectal malignancy and appendectomy.

Objectives: To determine the relation in between the colorectal cancer and appendectomy.

Design: Observational retrospective study.

Setting: Armed Forces Hospitals, Taif, Saudi Arabia.

Patients and methods: We reviewed from our database in Armed forces hospitals the patients who were diagnosed and operated for colorectal cancer in the period between October 2018 till October 2020. Our study included 79 patients. 73 of them were colon cancer and rectal cancer cases were 6. 12 of those patients we couldn't obtain their complete data either they died, or no contact details were available.

Results: Our results revealed no significant relation between patients who underwent appendectomy and development of cancer later.

Conclusion: Our data didn't support the hypothesis that patients with previous appendectomy have a higher risk of developing colorectal adenocarcinoma.

Key words: Colorectal cancer, post appendectomy, risk.

Introduction

Colorectal cancer ranks third of the most common cancers worldwide with increasing rate in many societies including the middle east countries.¹ It ranks first in males and third in females among all cancers in Saudi Arabia. Its frequency of diagnosis has increased significantly over the past ten years.² The risk factors of colorectal cancer include old age, male gender, a low-fiber diet, smoking, drinking, diabetes, genetics, and environment. Inflammation has also been implicated in the risk of cancers. Chronic intestinal inflammation, namely inflammatory bowel disease (IBD), is recognized as an important risk factor that promotes the development of colon cancer, although the cellular and microbial mechanisms remain unclear.³ The vermiform appendix in humans is generally regarded as a vestigial structure. However, studies suggest that it serves as a "safe house" for biofilm formation to preserve and protect commensal bacteria needed for the epithelial mucosa in the colon.³ The appendix is thought to have some immune function based on its association with substantial lymphatic tissue. The main function of appendix is not clearly described yet. It seems like a guardian of colon.¹ Appendectomy is the most performed emergency surgical procedure and accounts for 1-2% of all surgical operations.¹ The impact of appendectomy on colorectal cancer risk, particularly in the long term, is unclear. This idea initially hypothesized that appendectomy increases colorectal cancer risk due to decreased immunocompetency. However, recent studies conducted on clinical databases have

found little evidence of an association between prior appendectomy and colorectal cancer risk, other than a short-term increase in risk following the procedure in older individuals.⁴

Patients and methods

This was a retrospective observational study which was done From October 2018 to October 2020. Our study included 79 patients. Twelve patients were excluded from the study. In those 12 patients, we couldn't obtain complete data because, they either died, or no contact details were available. So, sixty-seven patients (38 females and 29 males) were included in this study at the General Surgery department, Armed Forces Hospitals, Taif, Saudi Arabia.

Including criteria

- Patients with positive histopathology for colorectal adenocarcinoma.
- Patients who underwent surgical management.

Exclusion criteria

- Pre-existing malignancy
- Inflammatory bowel disease
- Patient with no complete data either for loss of follow up or no contact details.

The files of all patients included in this study were checked. The patients' demographic data including gender and smoking status in addition to clinical

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data including all present and past history were studied. Specifically, history of past appendectomy was identified.

Technique

The technique involved in our study included all types of colectomies done for colorectal cancer both open and laparoscopic approaches. Also, appendectomy either open or laparoscopic was studied according to relevance.

Results

From October 2018 to October 2020, all colectomies done were registered {38 females (56.7%) and 29 males (43.3%)}, The mean age was 53.2 ± 13.7 (range 29 – 82) years and the median was 52 years (**Table 1**).

The Distribution of the studied cases according to Site of the tumor were ascending colon 16 cases (23.9%), Caecum 11 cases (16.4%), Transverse colon 6 cases (9%), Descending colon 21 cases (31.3%) and Rectosigmoid colon 13 cases (19.4%).

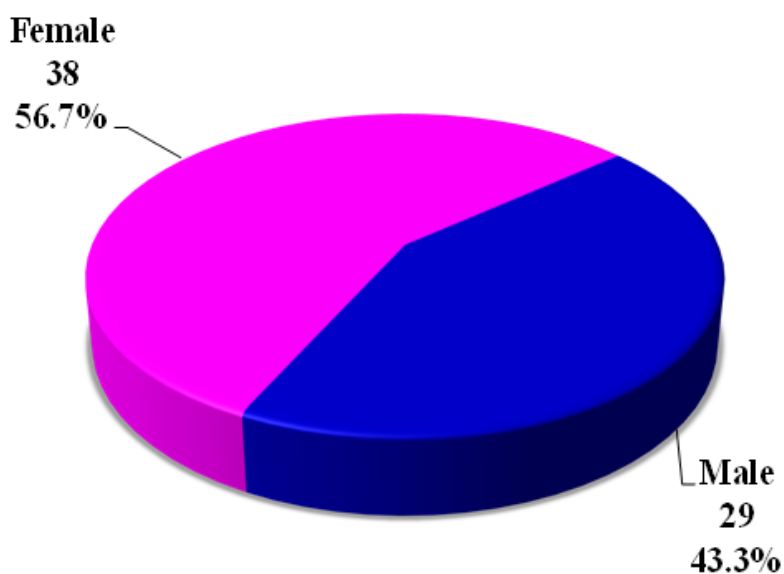


Fig 1: Distribution of the studied cases according to sex (N = 67).

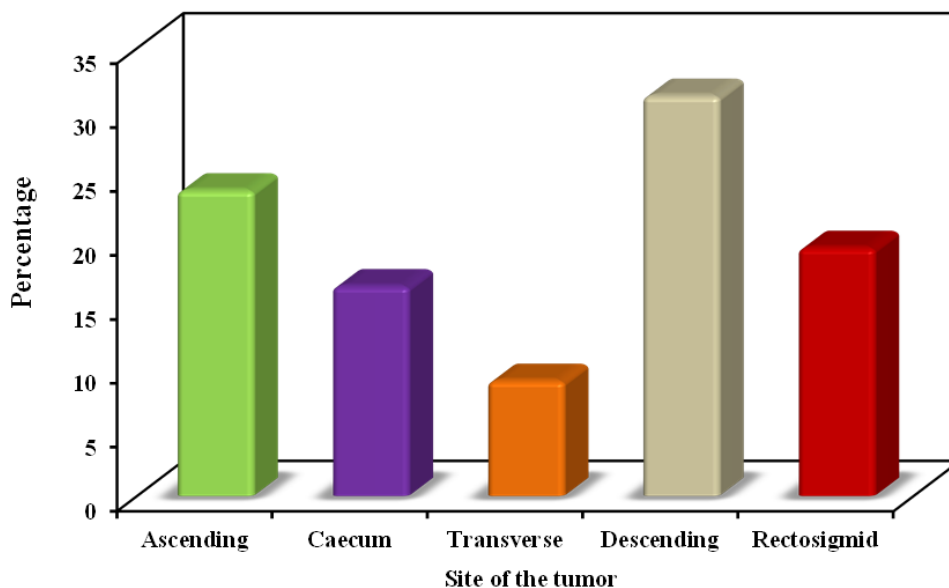


Fig 2: Distribution of the studied cases according to site of the tumor (n = 67).

Table 1: Preoperative data (Sex and age)

	No. (%)
Sex	
Male	29 (43.3%)
Female	38 (56.7%)
Age (years)	
Mean ± SD.	53.2 ± 13.7
Median (Min. – Max.)	52 (29 – 82)
SD: Standard deviation.	
Site of the tumor	
Ascending	16 (23.9%)
Caecum	11 (16.4%)
Transverse	6 (9%)
Descending	21 (31.3%)
Rectosigmoid	13 (19.4%)

Discussion

The impact of appendectomy on colorectal cancer risk, particularly in the long term, is unclear.⁴ Conflicting data exist regarding colorectal cancer risk following appendectomy. In a cohort of 167,561 persons who received multiphasic health checkups were followed up for cancer development. A history of appendectomy showed slightly negative non-significant associations with the development of cancer of the colon, rectum, and all sites combined.⁵ This study provides evidence against the hypothesis that a history of appendectomy or appendicitis indicates an increased risk of colorectal cancer. These data provide no support to the view that a missing appendix lessens immuno-competency and thereby increases the likelihood of cancer. Their findings do not support the hypothesis that there is an appendicitis-colon cancer association due to low dietary fiber, which is going with the same results of our pilot study.

In another study, Ergul et. al reviewed the medical records of 455 patients who received medical and/or surgical treatment with the diagnosis of colorectal carcinoma in two medical centers in a five-year period. Also, they reviewed the records of 166 patients (As control group) at the same period.¹ According to their analyses, being appendectomized increases the risk of rectum adenocarcinoma 3.232 times, left colon adenocarcinoma 2.537 times and right colon carcinoma 3.607 times. They hypothesized that appendix may particularly protect the colon from orally taken carcinogens and this view is against the results of our pilot study.

In 2015, Wu1 et. al identified a cohort of 75979 patients who underwent appendectomy between 1997 and 1999 based on the insurance claims of Taiwan. A comparison cohort of 303640 persons without appendectomy was selected randomly, frequency matched by age, sex, comorbidity, and entry year was also selected. They monitored subsequent colorectal cancer development in both cohorts. The overall colorectal cancer incidence was 14% higher in the appendectomy patients than in the comparison cohort ($p < 0.05$): the highest incidence was observed for rectal cancer, and the lowest incidence was observed for cancer of the cecum-ascending colon for both cohorts. Men were at higher risk than women. Results of their study suggested that appendectomy in patients with appendicitis was likely associated with the development of colorectal cancer in the post-surgery period.³

Our results revealed no significant relation between patients who underwent appendectomy and development of cancer later. Our data didn't support the hypothesis that patients with previous appendectomy have a higher risk of developing colorectal adenocarcinoma. Co-operation of multiple centers providing a bigger sample with prospective studies to follow the patients post appendectomy with a base line colonoscopy post operatively is recommended.

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