



# Synchronous Appendiceal Neoplasia of Ascending Colon Cancers: Three Case Reports And Review of the Literature

## Senkron Primer Apendiks ve Asendan Kolon Tümörü: Üç Olgu Sunumu ve Literatür Derlemesi

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### ABSTRACT

Colorectal carcinomas are the most common malignancies of the gastrointestinal tract. The incidence of synchronous primary appendicular neoplasms associated with colorectal cancer has been reported as 0.3-4.1%, but most of the studies are case reports and the actual incidence still remains unclear. Appendix embryologically originates from the large intestine, so the actual incidence of synchronous appendix tumors may increase. In this study, we aimed to report three patients who underwent right hemicolectomy for ascending colon adenocarcinoma and who had synchronous primary appendicular neoplasia determined histopathologically.

**Keywords:** Synchronous tumor, appendix, ascending colon

### ÖZ

Kolorektal kanserler, gastrointestinal sistemin en sık görülen maligniteleri olup, kolorektal kansere eşlik eden senkron apendiks tümörleri ile ilgili literatürde yetersiz sayıda çalışmanın çoğunluğu olgu sunumu şeklinde olması nedeniyle senkron apendiks tümörlerinin sıklığı net olmamakla birlikte %0,3-4 olarak bildirilmiştir. Apendiksin embriyolojik olarak kolondan köken alması göz önünde bulundurularak kolorektal tümör varlığında senkron apendiks tümör insidansının daha yüksek olabileceği değerlendirilerek; çalışmamızda insidental olarak senkron primer apendiks tümörü ve sağ kolon adenokarsinomu tespit ettiğimiz 3 olguyu sunmayı amaçladık.

**Anahtar Kelimeler:** Senkron tümör, apendiks, asendan kolon

### Introduction

The most common malignancies of the gastrointestinal tract are colorectal tumors. It has been reported that synchronous colorectal neoplasms are 3-5% and metachronous colorectal neoplasms are 2-3%.<sup>1</sup>

Neoplastic lesions of the appendix are rare, and approximately 25% of patients with appendix tumors are reported to be synchronous or metachronous colon tumors.<sup>2</sup>

The appendix is originated embryologically from large intestine and has a similar mucosal pattern to the colon and rectum, therefore, any neoplastic alteration of colon and rectum will affect appendix.<sup>3,4</sup> Appendiceal tumors are usually detected incidentally in patients who were operated for acute appendicitis and preoperative diagnosis is rare.<sup>3</sup> We present three cases of appendix tumors, which we detected incidentally in the right hemicolectomy specimens of ascending colon tumor cases.



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## Case Reports

### Case 1

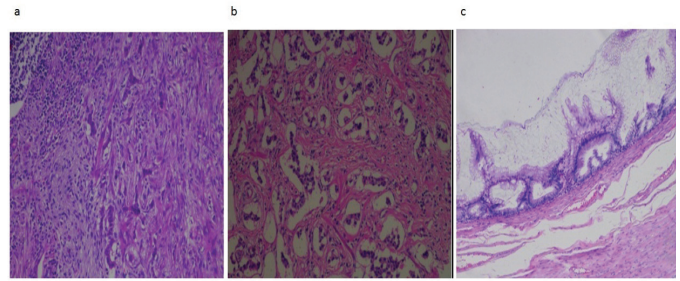
A 73-year-old female patient was diagnosed as adenocarcinoma of cecum by colonoscopy performed for anemia etiology. In terms of regional and distant organ metastasis, whole body radiological examination was performed and it revealed no additional pathology except for wall thickening of cecum. Right hemicolectomy was performed. Histopathological examination of the specimen revealed a moderately differentiated subserosal adenocarcinoma of cecum of 3x2.5x0.7 cm and a synchronous 0.3 cm neuroendocrine tumor (NET) of appendix (Figure 1a). Tumor was considered as T3N1aM0 (stage 3b-AJCC 2017) due to one metastasis from 30 removed lymph nodes. Postoperative adjuvant chemotherapy was performed and 37<sup>th</sup> month follow-up continues without any complications or recurrence.

### Case 2

A 58-year-old male patient was admitted to our clinic with complaints of abdominal pain, change in defecation habits and weight loss (20 kg/3 months). Colonoscopy showed an ulcerovegetant mass at hepatic flexure and biopsy was reported as adenocarcinoma. Right hemicolectomy was performed. Histopathological evaluation of the right hemicolectomy specimen revealed 8x2.5 cm, moderately differentiated subserosal adenocarcinoma with a mucinous component located at hepatic flexure. In addition, a 0.4 cm NET of appendix invading the superficial muscle layer was reported (Figure 1b). Metastatic involvement was one out of 46 removed lymph nodes. The patient was considered as T3N1aM0 (stage 3b-AJCC 2017). Postoperative adjuvant chemotherapy was performed and 34<sup>th</sup> month follow-up continues without any complications or recurrence.

### Case 3

An 80-year-old female patient was admitted to our clinic with complaints of weakness, colic-type abdominal pain and weight loss (5 kg/2 months). Colonoscopy showed an ulcerovegetant mass that narrowed the lumen of the ascending colon. Abdominal CT revealed wall thickening of cecum without any metastasis. Right hemicolectomy was performed and histopathological examination of the right hemicolectomy specimen revealed 5.5x5 cm moderately differentiated serosal adenocarcinoma of cecum and a low-grade mucinous neoplasia of appendix (Figure 1c). There was no metastasis in 27 removed lymph nodes. The patient was considered as T4aN0M0 (Stage 2b-AJCC 2017). Twelfth month follow-up without adjuvant chemotherapy continues without any complications or recurrence.



**Figure 1.** Histopathology of primary appendix neoplasia. a, b) Appendix vermiformis; small conglomerations and lined like trabecular modality of neoplastic cells without mitosis and atypia, (neuroendocrine tumor grade 1), haematoxylin and eosin x200, c) appendix vermiformis neoplasia (low grade appendiceal mucinous neoplasm); partly composed of villous structures with low grade atypia and floored by epithelial cells consisting of apical mucin, haematoxylin and eosin x100

## Discussion

Tumors of the appendix are very rare. Preoperative diagnosis is difficult and most of them are diagnosed incidentally after histopathologic examination of appendectomy specimens of acute appendicitis cases. The incidence of appendiceal tumors was reported as 1%, but actual incidence was accepted up to 5% because of missed histopathologic examination of appendectomy specimens.<sup>4</sup> There are studies reporting that appendix tumors are more common in colorectal tumor patients,<sup>2,5</sup> because the appendix originates embryologically from the colon and has a similar mucosal structure like colon and rectum.<sup>6,7</sup> Tumors of the appendix are NET, mucocèles and adenocarcinomas. NETs, commonly referred to as carcinoid tumors, are the most common tumors of the appendix. They constitute 80% of all appendiceal masses and 0.5% of appendectomy materials.<sup>8</sup> NET mostly originates from appendix in gastrointestinal system at a rate of 40-50%.<sup>9</sup> The clinical importance of NET is being synchronous with other gastrointestinal malignancies at a rate of 55%.<sup>10</sup> Mucocèle constitutes 0.2-0.5% of all appendiceal neoplasms.<sup>11</sup> Appendiceal adenocarcinoma accounts for 6% of appendiceal tumors and 0.2-0.5% of all gastrointestinal tumors.<sup>12</sup> The appendix tumors with these clinical features do not have any pathognomonic signs or symptoms, and it is difficult to diagnose them preoperatively. In our study, two cases were NET and one was mucinous neoplasia.

Recently, some studies have recommended incidental appendectomy during colorectal cancer operations because of the difficulties in the diagnosis of synchronous appendix tumors preoperatively. Khan and Moran<sup>13</sup> reported the incidence of synchronous appendiceal and colorectal cancer as 4.1% in 169 patients with colorectal cancer who had incidental appendectomy. In the same study, the authors reported that more appendix tumors

were diagnosed histopathologically for rectal cancers than right hemicolectomy surgeries<sup>13</sup> and it was considered that separate appendectomy specimens were examined more carefully than appendix in a right hemicolectomy specimen. Albright et al.<sup>14</sup> defined a lifetime appendectomy risk of 6-7%. They considered that additional appendectomies for colorectal malignancies were cost effective because additional appendectomy would not prolong operative time and future appendectomies would be more difficult because of previous abdominal operations. Lohsiriwat et al.<sup>15</sup> reported that the rate of synchronous primary appendix tumor was 0.3%, and the secondary appendix tumor/appendix metastasis was 1% in 293 cases who underwent incidental appendectomy. Some authors recommend incidental appendectomy in colorectal tumor surgery, defining that appendectomy does not cause an additional risk of infection in major bowel surgery, and some authors argue this association as coincidental because of they are being the most common gastrointestinal tumors. In our study, we detected only three appendix tumors in the last 5 years in patients who underwent right hemicolectomy due to colon tumors. We deliberated that prospective studies consisting of large case series are needed for the decision of incidental appendectomy in colorectal tumor surgery. Incidental appendectomies during colorectal malignancy surgeries will not affect wound infection rates and mortality or morbidity rates, so that incidental appendectomies can be added for all colorectal malignancy surgeries.

### Ethics

**Informed Consent:** Written informed consent obtained from all cases.

**Peer-review:** Internally peer-reviewed.

### Authorship Contributions

Surgical and Medical Practices: M.T.B., Concept: İ.Y., M.S., Design: İ.Y., Data Collection or Processing: M.T.B., A.S., Analysis or Interpretation: M.T.B., A.S., Literature Search: O.E., Writing: İ.Y., M.S.

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