Chirurgia. eCollection 2025 March

http://dx.doi.org/10.21614/chirurgia.120.eC.3082

Collision Tumor Consisting of Mantle Cell Lymphoma and Mucinous Adenocarcinoma in Ascending Colon: Case Report

Marija Milic Perovic[1]*, Aleksandar Karamarkovic[2,3], Radmila Jankovic[3,4], Svetlana Lazarevic[1], Jovan Juloski[2,3], Vladica Cuk[2,3]

[1]Department of Pathology, University Medical Center Zvezdara, Belgrade, Serbia
[2]Surgery Clinic Nikola Spasic, University Medical Center Zvezdara, Belgrade, Serbia
[3]University of Belgrade, Faculty of Medicine, Serbia
[4]University of Belgrade, Faculty of Medicine, Institute of Pathology, Belgrade, Serbia

***Corresponding author:**
Marija Milic Perovic, M.D.
Department of Pathology
University Medical Center Zvezdara
Dimitrija Tucovića 161, 11 000
Belgrade, Serbia
E-mail: mariemilic011@gmail.com

Received: 19.12.2024
Accepted: 12.02.2025

Rezumat

Tumoră de coliziune formată din limfom cu celule de manta și adenocarcinom mucinos în colonul ascendent: prezentare de caz

Introducere: Neoplasmele mixte reprezintă o familie largă de tumori complexe, caracterizate prin prezența a mai multor tipuri de țesut neoplazic. Aceste tumori mixte sunt clasificate în tumori de tip coliziune, compozite, carcinosarcoame şi tumori amficrine.
Prezentare de caz: În continuare, prezentăm un caz de tumoră de coliziune formată din limfom cu celule de manta şi adenocarcinom mucinos, localizată la nivelul colonului ascendent la un pacient de sex masculin, în vârstă de 63 de ani. Pacientul a fost internat în spital din cauza anemiei sideropenice, durerii abdominale centrale iradiate în flancul drept şi a episoadelor ocazionale de scaune diareice.
Rezultate: Investigațiile de laborator au evidențiat anemie sideropenică, trombocitoză şi sindrom inflamator. Colonoscopia a identificat o formațiune ulcero-vegetantă, situată la nivelul unghiului hepatic. Biopsia endoscopică efectuată din leziune a confirmat prezența unui adenocarcinom slab diferențiat. Tomografia computerizată a evidențiat o îngroşare circumferențială a peretelui colonului la nivelul unghiului hepatic, determinând o reducere a lumenului colonic pe o lungime de 10 cm. De asemenea, s-au observat adenopatii regionale multiple. În consecință, s-a decis practicarea unei hemicolectomii drepte cu ileo-transverso-anastomoză. Examinarea histopatologică a evidențiat o formațiune tumorală ulcero-vegetantă la nivelul colonului ascendent. Examinarea

microscopică a leziunii a confirmat prezența unui adenocarcinom mucinos slab diferențiat în coliziune cu un limfom cu celule de manta, diagnosticul fiind confirmat prin tehnici imunohistochimice. Ganglionii limfatici regionali erau măriți şi infiltrați de celule limfomatoase. După intervenția chirurgicală, pacientul a urmat chimioterapie de tip R-CHOP. Conform datelor disponibile, în literatura de specialitate au fost raportate doar patru cazuri similare până în prezent.
Din păcate, nu au fost disponibile informații privind evoluția pe termen lung a pacientului.
Concluzie: Diagnosticul tumorilor de coliziune rămâne o provocare, iar prognosticul şi conduita terapeutică nu sunt încă suficient studiate. Sunt necesare mai multe raportări de cazuri pentru a putea stabili protocoale standardizate de tratament.

Cuvinte cheie: tumoră de coliziune, adenocarcinom mucinos, limfom cu celule de manta, colon ascendent

Abstract

Introduction: Mixed neoplasms represent a big family of complex tumors that consist of more than one neoplastic tissue. Mixed tumors are categorized into collision, composite, carcinosarcomas, and amphicrine tumors.
Case Report: Hereinafter, we describe a case of a collision tumor composed of mantle cell lymphoma and mucinous adenocarcinoma located in the ascending colon in a 63-year-old man. A patient was admitted to the hospital due to sideropenic anemia, central abdominal pain spreading into the right lumbal area, and occasional loose stools.
Results: Laboratory tests revealed sideropenic anemia, thrombo-cytosis, and inflammatory syndrome. A colonoscopy detected an ulcer-proliferative mass located at the hepatic flexure. Endoscopic biopsy from the mass confirmed poorly differentiated adenocarcinoma. A computed tomographic scan demonstrated a circumferential thickening of the hepatic flexure that narrows the colon lumen to the length of 10 cm. Multiple regional lymph nodes were enlarged. Consequently, the patient underwent a right hemicolectomy with ileotransverse colon anastomosis. Pathologic findings showed an ulcer-exophytic mass in ascedens. Microscopic examination of the lesion detected a poorly differentiated mucinous adenocarcinoma colliding with mantle cell lymphoma that was confirmed by immunohistochemistry. Regional lymph nodes were enlarged, involved by lymphoma. Following the surgery, the patient received R-CHOP chemotherapy. To the best of our knowledge, only four such cases have been reported in the literature so far. Unfortunately, long-term follow-up was not available.
Conclusions: The diagnosis of collision tumors can be very challenging, and prognosis and therapy are still not investigated enough. More reports of collision tumors should be documented to establish standard protocols for treatment.

Key words: collision tumor, mucinous adenocarcinoma, mantle cell lymphoma, ascending colon

Introduction

Mixed neoplasms represent a big family of complex tumors that consist of more than one neoplastic tissue. It is an infrequent and complex group of tumors, mostly described in case reports and case series. Thus, their diagnosis can be very challenging, and prognosis and therapy are still not investigated enough. According to Shizas (1), mixed tumors are categorized into collision tumors, composite tumors, carcinosarcomas, and amphicrine

tumors. Regardless of the many criteria that differentiate these tumors, they overlap frequently. As a result, it is difficult to distinguish them.

Hereinafter we describe a case of collision tumor consisting of mantle cell lymphoma and mucinous adenocarcinoma located in the ascending colon. To the best of our knowledge, only four such cases have been reported in the literature so far.

Case Report

A 63-year-old man was admitted to the hospital due to sideropenic anemia. He had a two-month history of central abdominal pain spreading into the right lumbal area and occasional loose stools. His previous medical history included diabetes mellitus type II and hypertension. Laboratory tests revealed sideropenic anemia, thrombocytosis, and inflammatory syndrome. Esophagogastroscopy showed signs of oesophageal candidiasis and chronic gastritis. A colonoscopy revealed an ulcer-proliferative mass located at the hepatic flexure. Endoscopic biopsy specimen from the mass confirmed poorly differentiated adenocarcinoma. A computed tomographic scan demonstrated a circumferential thickening of the hepatic flexure that narrows the colon lumen to the length of 10 cm. Multiple regional lymph nodes were enlarged, ranging in diameter from 0,7 to 2,1 cm. Paraaortal, paracaval, and iliac lymph nodes were normal, measured from 0,6 to 0,7 cm. Hepatomegaly and splenomegaly were not noticed. Consequently, the patient underwent a right hemicolectomy with ileotransverse colon anastomosis.

Pathologic Findings

The resected colon showed an ulcer-exophytic mass (diameter 8 cm) in ascedens, 6 cm from the distal colonic margin. The cut surface of the lesion was homogenous grayish-white, extending into the pericolic tissue. Twenty-four regional lymph nodes, ranging from 0,4 to 2 cm in maximum dimension, were found in the pericolic fat tissue. Representative sections of tumor and regional lymph nodes were sampled.

Paraffin-embedded blocks were prepared conventionally and sections were stained with hematoxylin-eosin. Microscopic examination of the previously described lesion revealed a poorly differentiated mucinous adenocarcinoma invading through the muscularis propria into the pericolic fibro-adipose tissue (*Fig. 1A*). Adenocarcinoma consisted of nests, stripes, and small glands floating in the large extracellular mucin lakes, comprising more than half of the tumor mass. In addition, in the subserosal fat tissue, multiple lymphoid aggregates slightly interspersed with mucin pools of adenocarcinoma were found. Lymphoid

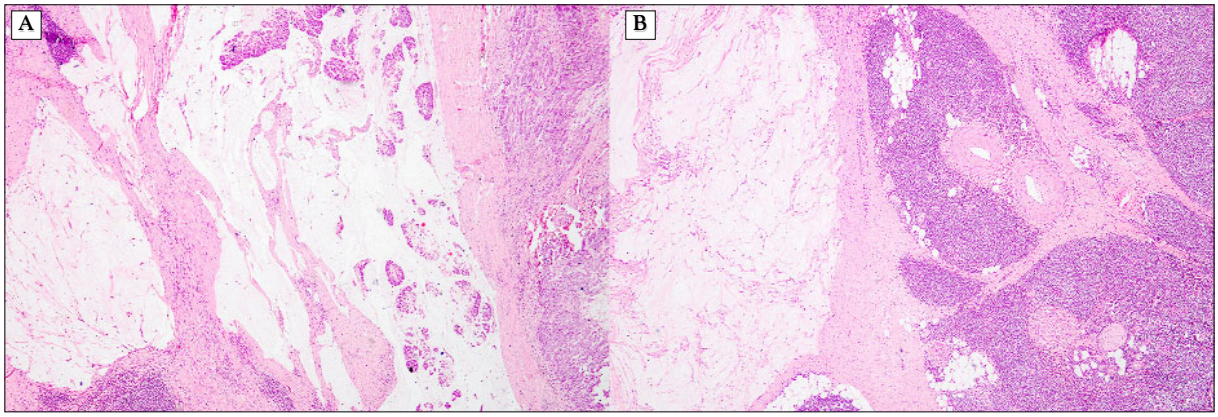

Figure 1. **(A)** Mucinous adenocarcinoma invades through muscularis propria (H&E x4); **(B)** Mucin pools of adenocarcinoma with multiple lymphoid aggregates in the subserosal fat tissue (H&E x4)

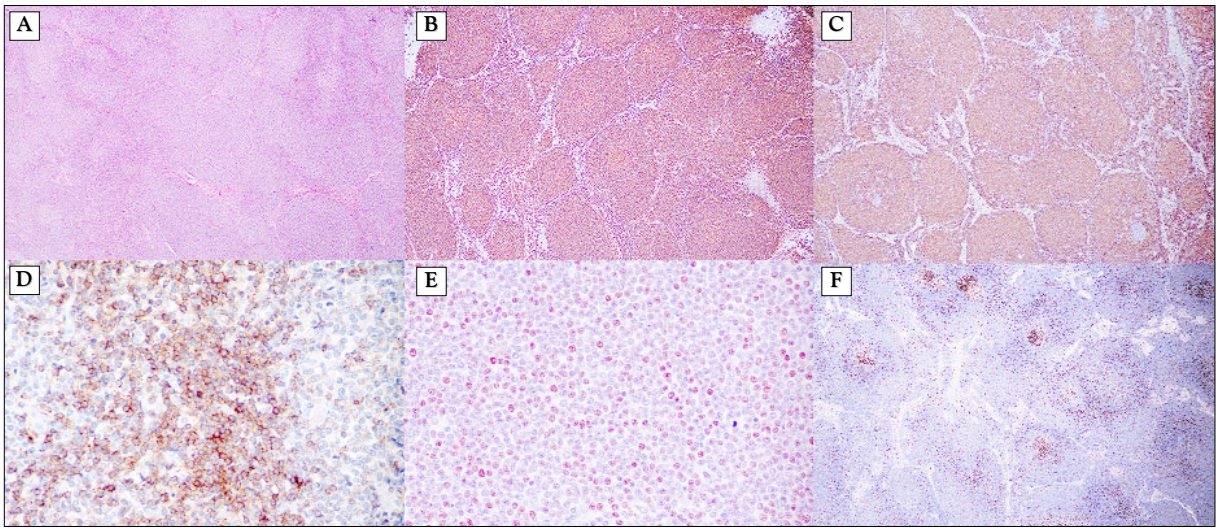

Figure 2. **(A)** Lymph node replaced by lymphoid cells (H&E x4); **(B)** Diffuse immunostaining positivity for CD20 (x4); **(C)** Bcl2 positivity (x4); **(D)** CD5 positivity (x40); **(E)** Cyclin D1 positivity (x40); **(F)** Ki-67 positivity is detected in 15-20% of lymphoid cells (x4)

aggregates consisted of small cells with scant pale cytoplasm, irregular nuclei, clumped chromatin, and inconspicuous nucleoli (*Fig. 1B*). Twenty-four regional lymph nodes were negative for metastatic adenocarcinoma. Still, they were replaced by a uniform-appearing population of lymphoid cells with microscopic features similar to those seen in the colon (*Fig. 2A*).

Immunohistochemical analyses showed that the atypical lymphoid cells in the colon and lymph nodes as well were reactive for CD20, Bcl-2, CD5 and Cyclin D1 (*Fig. 2B, C, D* and *E*) and undetectable for Bcl-6, CD10, CD3, CD23 and MUM1 (not shown). The Ki-67 antibody detected a proliferative activity of 15-20% (*Fig. 2F*). Small undifferentiated cells of adenocarcinoma were diffusely positive for MUC2 and CDX2 (*Fig. 3A, B*).

The morphological and immunohistochemical findings were consistent with the diagnosis of collision tumor comprising of mantle cell lymphoma and mucinous adenocarcinoma.

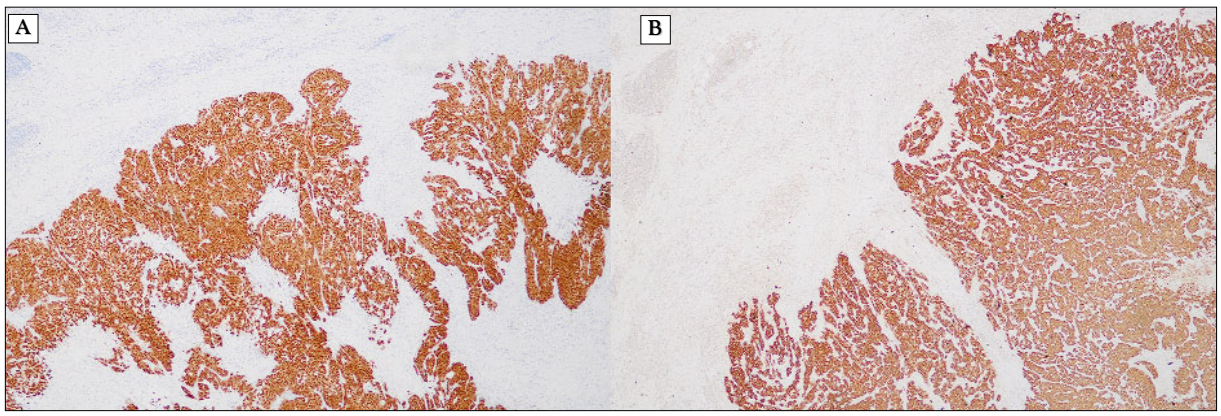

Figure 3. Adenocarcinoma was diffusely positive for **A)** MUC2 and **B)** CDX2.

After surgery, the patient received R-CHOP chemotherapy. Unfortunately, long-term follow-up was not available.

Discussion

Collision tumors are a rare clinical entity consisting of two histologically distinct tumor types that occur at the same anatomical site (2). Collision tumors were first described by Bernet in 1902 and modified by Meyer in 1919. (3). There are a few theories about the origin of collision tumors. The first theory suggests that the occurrence of both tumors is coincidental. Two tumors develop in continuity through the accidental meeting. The second theory implies that a carcinogenic stimulus may interact with different tissues, producing different neoplasms that later collide (4). This theory could explain the origin of collision tumors in the stomach, such as adenocarcinoma and lymphoma due to H. pylori infection or Ebstein-Barr Virus infection (5). Still, there is no evidence of etiologic factors that can cause the development of both adenocarcinoma and malignant lymphoma in the colon. Another hypothesis suggests that the presence of the first tumor alters the microenvironment, such as angiogenesis and inflammation, which facilitate the development of the second adjacent tumor (6). Additionally, some reports insinuate that excessive lymphoid reaction, as a part of an immune response, in adenocarcinoma, can lead to malignant transformation of lymphoid tissue and the development of the lymphoma (7).

According to Shizas et al., the most frequent localization of collision tumors in the gastrointestinal system is the distal third of the esophagus. The large intestine represents the least frequent localization of collision tumors in an alimentary tract. Furthermore, the most common combination of neoplastic tissue in the collision tumor of the large intestine is a mixture of adenocarcinoma and neuroendocrine tumor (1). Collision tumors consisting of adenocarcinoma and lymphoma are very infrequent, with only 23 cases reported in the literature from 1969 to now (8).

In general, primary extranodal colonic lymphoma is very rare; approximately 0.16 - 0.60% of all primary colorectal cancers and 10-20% of all gastrointestinal lymphomas (9). On the other hand, adenocarcinoma is the most common histologic subtype of colorectal carcinoma, and its distinct histologic subtype is mucinous adenocarcinoma, which is featured by abundant mucinous components that contain at least 50% of the tumor volume (10). It is more commonly found in the proximal colon than the rectum or distal colon (11,12). Primary colonic lymphoma is also more frequently documented in the proximal colon (8,9,12,13,14,15,16). The above-mentioned is assumed due to the rich and active proliferation of lymphoid tissue in this region. Despite that, there are a few cases of primary lymphoma colliding with adenocarcinoma, documented in the rectum and sigmoid colon, as well (17,18). The collision tumor in the current case occurred in the ascending colon.

The most frequently found lymphomas colliding with adenocarcinoma in the literature are diffuse large B-cell lymphoma, followed by mucosa-associated lymphoid tissue lymphoma and small lymphocytic lymphoma (19,12). To the best of our knowledge, there are only five cases documented in the literature of synchronous adenocarcinoma and mantle cell lymphoma, and four of them being reported as coexisting adjacent tumors in the large intestine (*Table 1*) (13,17,20,21). In most reported cases, mantle cell lymphoma was presented as a polypoid lesion or nodular area, except in one case, where the remaining mucosa was grossly unremarkable. Adenocarcinoma was located in the caecum, rectum, and ascending colon, with tumor extension through the muscularis propria into pericolonic fibro adipose tissue. In one case, liver metastases were present. Regional lymph nodes were mostly involved by lymphoma, in two cases both lymphoma and carcinoma were present, and only in one case were negative. Therapy consisted of surgery and a combination of chemotherapy for lymphoma and adenocarcinoma and radiation therapy for adenocarcinoma, as well.

Table 1. Cases with synchronous adenocarcinoma and mantle cell lymphoma in the colon in the literature

No	Year	Age/ Sex	Carcinoma location	MCL location	Carcinoma -Gross appearance/Depth	MCL-Gross appearance	Lymph node involvement	Treatment
1	1995 (20)	74/F	Caecum and rectum	Caecum	Caecum: ulceration/PAT Rectum: polypoid mass/PAT	Polypoid mass	Lymphoma	Panproctolecomy
2	2001 (17)	54/M	Ascending colon	Ileum	Exophytic mass/PAT liver metastasis	Polypoid mass	Negative	Right hemicolectomy and chemotherapy
3	2001 (17)	74/M	Rectum	Rectum	Ulcerated mass/PAT	Grossly unremarkable	Both	Low anterior resection and radiation therapy
4	2003 (13)	85/M	Caecum	Caecum, ileum	Exophytic mass/PAT	Nodular area	Lymphoma	Right hemicolectomy
5	2023 (21)	63/M	Rectum	Rectum, colon, ileal	Ulcerated mass PAT	Multiple nodules	Both	Low anterior resection with ileum resection and R-CHOP chemotherapy
Present case		63/M	Ascending colon	Ascending colon	Ulceration/PAT	Grossly unremarkable	Lymphoma	Right hemicolectomy and R-CHOP chemotherapy

F, female; M, male; MCL, mantle cell lymphoma; PAT, pericolic fibro-adipose tissue

The diagnosis of a collision tumor can be very challenging. One of the biggest mistakes is that one of the components of a collision tumor is missed and neglected, so consequently, a patient will not receive proper therapy. The small amount of tissue in the biopsy specimen usually contains only one component of the collision tumor. Only pathohistological evaluation of the surgical specimen can give a complete insight into the tumor. It may be missed as a reactive lymphoid proliferation if the lymphoma component is low-grade. Furthermore, if the lymphoma component is high-grade, it may be mixed with poorly differentiated adenocarcinoma (8). Hence, thorough and careful examination of biopsy and surgical specimen is crucial for the correct diagnosis. Immunohistochemistry for epithelial and lymphoid markers is necessary for definitive diagnosis. In our case, we didn't reveal lymphoma during the preoperative examination. The diagnosis on biopsy was poorly differentiated adenocarcinoma. It was discovered inadvertently throughout pathohistological examination of the surgical specimen, and afterwards confirmed with immunohistochemical analyses.

Regarding the rare and complex nature of collision tumors, it is very hard to predict their biological behavior. There is no standard protocol for treatment and prognosis. However, some studies suggest that treatment should focus on the collision tumor's more aggressive element, more precisely, on the infiltration pattern of the lymph nodes (18,22,23). In most cases, lymph node metastases derive only from one component. However, there are some cases with a biphasic pattern of infiltration, where both components are present in lymph nodes (17,21,24,25). In the current case, all lymph nodes were involved by mantle cell lymphoma. Thus, depending on the stage and size of the more aggressive tumor, therapy can include surgical removal, chemotherapy, and radiation. In the present case, we performed surgical resection because the pathohistological report pointed out poorly differentiated adenocarcinoma. Microscopic analysis of surgical specimen showed mucinous adenocarcinoma in pT3N0Mx stadium and infiltration of mantle cell lymphoma. Mantle cell lymphoma generally exhibits a moderately aggressive clinical course, and the disease is considered incurable (26). Mucinous adeno-carcinoma has a poorer prognosis than nonmucinous colorectal adenocarcinomas, with a 5-year survival rate of 41% (27). However, in our case, long-term follow-up was not accessible.

Conclusion

In summary, we describe a rare case of

collision tumor comprising mucinous adenocarcinoma and mantle cell lymphoma, which was not detected grossly and only diagnosed postoperatively. Clinicians and pathologists should be aware of these complex and rare tumors and try to avoid missed and inaccurate diagnoses. Furthermore, more reports of collision tumors should be documented to establish standard protocols for treatment and long-term follow-up of these patients.

Conflict of Interests

The authors declared no potential conflicts of interest.

Ethical Statement

This publication did not involve any data requiring ethical approval.

References

1. Schizas D, Katsaros I, Michalinos A, Damaskos C, Garmpis N, Ntomi N, et al. Collision Tumors of the Gastrointestinal Tract: A Systematic Review of the Literature. Anticancer Res. 2018;38(11):6047-6057.
2. Murthaiah P, Truskinovsky AM, Shah S, Dudek AZ. Collision tumor versus multiphenotypic differentiation: a case of carcinoma with features of colonic and lung primary tumors. Anticancer Res. 2009;29(5):1495-7.
3. Meyer R. Beitrag zur verstandigung uber die namengebung in der geschwurstiehre. Zentralbl Allg Pathol. 1919;30:291–6
4. Nirenberg A, Ostor AG, Qiun MA. Collision tumor: serous adenocarcinoma and steroid cell tumor of the ovary. Pathology. 1992;24(2):60-2.
5. Michalinos A, Constantinidou A, Kontos M. Gastric collision tumors: An insight into their origin and clinical significance. Gastroenterol Res Pract. 2015:2015:314158.
6. Shigeno T, Fujimori K, Tsuruta F, Nozawa Y, Nagaya T, Maejima T. Ileocecal collision tumor composed of adenocarcinoma and primary malignant lymphoma. Clin J Gastroenterol. 2011;4(2):79-84.
7. Mannweiler S, Dinges HP, Beham-Schmid C, Hauser H, Starlinger M, Regauer S. Colliding/concomitant tumors of the intestine: report of 3 cases. Pathol Oncol Res. 2003;9(3):188-92. .
8. Bao L, Feng X, Wang T, Xing F. Collision tumor of carcinoma and lymphoma in the cecum: case report and review of literature. Int J Clin Exp Pathol. 2020;13(11):2907-15.
9. She WH, Day W, Lau PY, Mak KL, Yip AW. Primary colorectal lymphoma: case series and literature review. Asian J Surg. 2011;34(3):111–4.
10. Bosman FT, Carneiro F, Hruban RH, Theise ND. WHO classification of tumors of the digestive system. 4th ed. Geneva: World Health Organization Classification of Tumours; 2010.
11. Hugen N, Verhoeven RH, Radema SA, de Hingh IH, Pruijt JF, Nagtegaal ID, et al. Prognosis and value of adjuvant chemotherapy in stage III mucinous colorectal carcinoma. Ann Oncol. 2013;24(11):2819-24.
12. Jiang M, Yuan X. Collision tumor of primary malignant lymphoma and adenocarcinoma in the colon diagnosed by molecular pathology: A case report and literature review. World J Clin Cases. 2023;11(26):6289-97.
13. Padmanabhan V, Trainer TD. Synchronous adenocarcinoma and mantle cell lymphoma of the colon. A Case Report and Review of the Literature. Arch Pathol Lab Med. 2003;127(2):E64-6.
14. Kus T, Aktas G, Kalender ME, Sari I, Ulker E, Camci C. Collision tumor consisting of primary follicular lymphoma and adenocarcinoma in the cecum: A case report and literature review. Oncol Lett. 2016;11(4): 2801-2805.
15. Kataoka J, Nitta T, Ota M, Fujii K, Ishii M, Senpuku S, et al. Collision Tumor Comprising Primary Malignant Lymphoma and Adenocarcinoma in the Ascending Colon. Case Rep Gastroenterol. 2021;15(1):379-388.
16. Sasaki S, Hatanaka K, Sahara N, Uekusa T, Hirayama K, Shirahata A et al. Collision tumor of primary malignant lymphoma and adenocarcinoma in the colon: report of a case. Surg Today. 2010;40(10):975-81.
17. Kanehira K, Braylan RC, Lauwers GY. Early phase of mantle cell lymphoma: a report of two cases associated with advanced colonic adenocarcinoma. Mod Pathol. 2001;14(8):811-7.
18. Lin H, Jiang JK, Lin JK. Collision tumor of low-grade B-cell lymphoma and adenocarcinoma with tuberculosis in the colon: a case report and literature review. World J Surg Oncol. 2014;12:147.
19. Parra-Medina R, Rocha F, Castaneda-Gonzalez J, Moreno-Lucero P, Veloza L, Romero-Rojas. Synchronous or collision solid neoplasms and lymphomas A systematic review of 308 case reports. Medicine (Baltimore). 2022;101(28):e28988.
20. Hopster D, Smith PA, Nash JRG, Elders K, Poston GJ. Synchronous multiple lymphomatous polyposis and adenocarcinoma in the large bowel. Postgrad Med J. 1995;71(837):443.
21. Vu KV, Trong NV, Khuyen NT, Nga DH, Anh H, Trung NT et al. Synchronous rectal adenocarcinoma and intestinal mantle cell lymphoma: A case report. World J Clin Cases. 2023;11(24):5772-5779.
22. Mesina C, Vasile I, Ciobanu D, Calota F, Gruia CL, Streba L, et al. Collision tumor of recto-sigmoidian junction - case presentation. Rom J Morphol Embryol. 2014;55(2 Suppl):643-7.
23. Haddadi S,Touati R, Graidia N, Ourdane R, Yahia Messaoud Y, Namaoui Y. Synchronous adenocarcinoma and marginal zone B-cell lymphoma of the colon. A case report. Int J Surg Case Rep. 2021;84:106025.
24. Jernstrom P and Murray GC. Synchronous double primary lymphosarcoma and adenosarcoma (collision tumor) of the stomach with cancer-to-cancer metastasis. Cancer. 1966;19(1):60-6.
25. Parks TG. Malignant carcinoid and adenocarcinoma of the stomach. Br J Surg. 1970;57(5):377-9.
26. Cohen JB, Zain JM, Kahl BS. Current Approaches to Mantle Cell Lymphoma: Diagnosis, Prognosis, and Therapies. Am Soc Clin Oncol Educ Book. 2017:37:512-525.
27. Kanemitsy Y, Tomoyuki K, Takashi H, Yasui K, Morimoto T, Shimizu Y, et al. Survival after curative resection for mucinous adenocarcinoma of the colorectum. Dis Colon Rectum. 2003;46(2):160-7.