

**Small bowel adenocarcinoma in a young male: a case report**

Feras Mohammed Almajid<sup>1</sup>, Shumaila Tanveer<sup>2</sup>, Ali Mohammad Alamri<sup>3</sup>, Ahmed Alsayyah<sup>4</sup>, Areej Al Nemer<sup>4</sup>, Hanan Mesfer Alghamdi<sup>5</sup>

<sup>1</sup> MD, Assistant Professor, King Fahad Hospital of the University, Department of Surgery, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

<sup>2</sup> FCPS, Assistant Professor, King Fahad Hospital of the University, Department of Surgery, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

<sup>3</sup> MD, Professor, King Fahd Hospital of the University, Department of Internal Medicine, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

<sup>4</sup> MD, Associate Professor, King Fahd Hospital of the University, Department of Pathology, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

<sup>5</sup> MBBS, MD, SB-Surg, FICS, Hepatobiliary & Multiorgan Transplant Surgeon, Assistant Professor, King Fahad Hospital of the University, Department of Surgery, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

**Type of article:** Case report

**Abstract**

**Introduction:** Adenocarcinoma of the third part of the duodenum is a rare type of tumor that has challenges in its diagnosis and management. Segmental resection with pancreatic sparing is a safe and accepted choice for the surgical intervention of this type of cancer.

**Case Presentation:** A 33-year-old male presented with a 3-week history of symptoms of gastric outlet obstruction with anemia and weight loss. Upon investigating the patient with computed tomography and esophagogastroduodenoscopy, he was found to have an adenocarcinoma that involved the third part of the duodenum. The patient underwent segmental resection of the third and fourth part of the duodenum with pancreatic sparing. He had a smooth postoperative course. The pathological evaluation shows a 3 cm moderately differentiated adenocarcinoma with free margins. Six out of thirteen lymph nodes were having metastasis. The patient developed a soft tissue recurrence 18 months after the operation.

**Take-away Lessons:** Adenocarcinoma of the third part of the duodenum should be kept in mind in any patient presented with symptoms of gastric outlet obstruction. It can be managed safely with segmental resection avoiding the morbidity of resection of the pancreas.

**Keywords:** Adenocarcinoma of the small bowel, third part of the duodenum, segmental resection

**Note:** This case report is prepared using the CARE Checklist (2013) of information to include when writing a case report (<https://www.care-statement.org>). The CARE guidelines for case reports help reduce bias, increase transparency, and provide early signals of what works, for which patients, and under which circumstance.

**Ethics of case report:**

The case report was approved by the institutional review board at the university with IRB number 2015-01-148 on July 30, 2015. Authors are allowed to publish the case report, and the patient has authorized them to publish the analysis of their medical records anonymously.

**Corresponding author:**

Assistant Professor Dr. Hanan Mesfer Alghamdi, King Fahad Hospital of the University, Department of Surgery, College of Medicine, Imam Abdulrahman Bin Faisal University, AlKhobar, Saudi Arabia.

Tel: +966.502828333, Fax: +966.38468290, Email: [hmalghamdi@iau.edu.sa](mailto:hmalghamdi@iau.edu.sa) and [hananghamdi@yahoo.com](mailto:hananghamdi@yahoo.com)

Received: September 10, 2018, Accepted: March 19, 2019, Published: June 2019

iThenticate screening: March 02, 2019, English editing: April 02, 2019, Quality control: April 04, 2019

This article has been reviewed / commented by three experts

© 2019 The Authors. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

## 1. Introduction

Small bowel cancer is one of the rare types of cancer as its incidence accounts for less than 1% of all other types of cancer in the United States (1). Moreover, it accounts only for about 2.3% of cancers of the digestive system. Duodenum is the most affected part of the small bowel with cancer (2). However, cancer involving the third or fourth part of the duodenum has its unique challenges in its diagnosis and management due to its complex anatomical location (3). We reported this rare case of a young male with adenocarcinoma in the third part of the duodenum and reviewed the relative literature.

## 2. Case Presentation

### 2.1. History and physical examination

A 33-year-old male, who is not known to have any chronic medical illness, was presented to the emergency room complaining of recurrent epigastric discomfort and postprandial vomiting for 3 weeks duration. The patient also gave a history of unintentional weight loss over three months prior to his presentation. The patient denies any history of fever, change of bowel habits, or jaundice. He was a heavy smoker (2 packs per day for about 10 years, but he quit smoking 3 years prior to his presentation). He denied any gastrointestinal malignancies in his family. Physical examination revealed a cachexic and pale young male with body mass index of 19.3 kg/m<sup>2</sup> (Weight = 55 kg, height = 1.69 m). He was maintaining normal vital signs. His abdominal examination was unremarkable.

### 2.2. Laboratory and imaging investigation

The patient's initial blood laboratory investigations were unremarkable except for a low hemoglobin level of 10 g/dl. Carcinoembryonic antigen and carbohydrate antigen were in normal range. CT scan of the chest, abdomen, and pelvis revealed the presence of a circumferential 2 cm mass involving the third part of the duodenum that is abutting the superior mesenteric artery without significant lymph-nodes enlargement (Figure 1). There was no evidence of distant metastasis. Esophagogastroduodenoscopy identified an ulcerative lesion in the third part of the duodenum (Figure 2). Histopathological examination of the biopsy specimen from that lesion revealed a moderately differentiated adenocarcinoma.

### 2.3. Treatment and outcomes

The patient underwent segmental resection of the third and fourth part of the duodenum with sparing of the pancreas. Reconstruction was made using Roux-en-Y duodenojejunostomy. The patient tolerated the procedure well and had a smooth postoperative course with no immediate or late postoperative complication. Histopathological evaluation of the resected specimen revealed a moderately differentiated adenocarcinoma of the duodenum of a 3.5 cm in size. Six out of thirteen lymph nodes were found to be positive for malignancy and all the surgical margins were free from malignancy (Figure 3). The malignancy was staged as T3N2M0. The patient had a smooth postoperative course and was discharged home on 6<sup>th</sup> day post-operatively in good condition. One month later, the patient went under adjuvant chemotherapy in the form of cisplatin and capecitabine. However, only three cycles of treatment was given since patient declined continuation of chemotherapy and opted for alternative medicine.



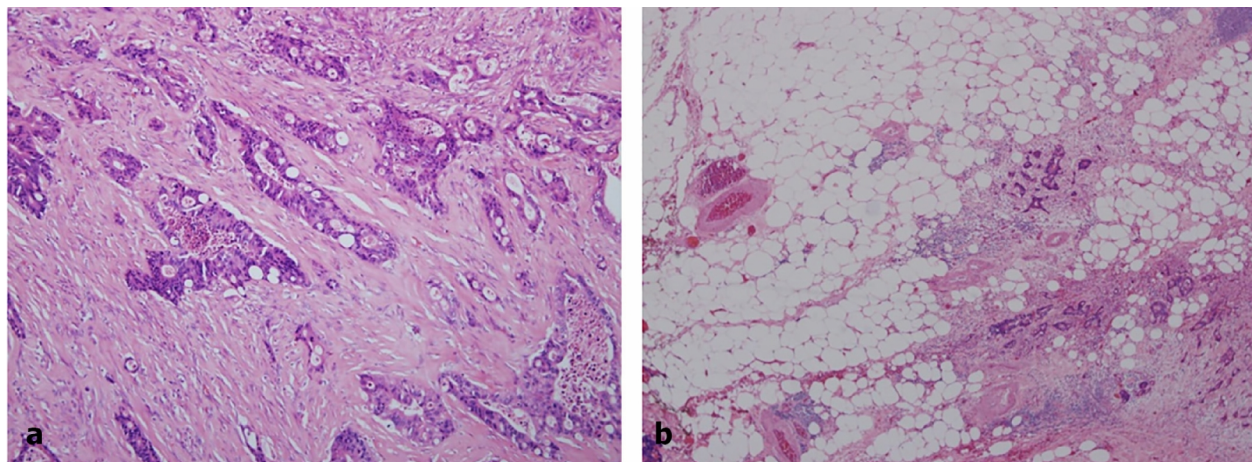
**Figure 1.** Computed tomography scan of the abdomen showing mural thickening of the third part of the duodenum

#### **2.4. Follow-up**

The patient was on regular follow up with an oncology clinic and hepatobiliary and pancreatic surgery clinic with an annual computed tomography scan. After two years of follow-up, the patient was discovered to have a soft tissue mass on the computed tomography. Its size was 2×4.5×3cm and was located over the surgical bed. This mass was avid in the positron emission tomography-computed tomography (PET/CT) scan indicating a local recurrence. A tumor board was conducted with a recommendation of giving 12 cycles of concurrent chemo-radiotherapy of FOLFIRINOX regimen with no need for another surgical intervention. The patient received the therapy with a good response. Repeated PET/CT scan one year later revealed remaining of that soft tissue recurrence. Since the patient was asymptomatic, no further management was required.



**Figure 2.** Esophagogastroduodenoscopy image of the ulcerative lesion in the duodenum



**Figure 3.** Microscopic image of **a)** the moderately differentiated adenocarcinoma invading through the muscularis propria **b)** the tumor reaching the pericolic fat

### 3. Discussion

There are various histological types of small bowel cancer in which adenocarcinoma constitute about 36.9% of them. Other types are carcinoid (37.4%), stromal tumors (8.4%), and lymphomas (17.3%) (4). In an analytic study of small bowel adenocarcinoma, duodenum was the most commonly affected part (57%) followed by jejunum (29%) and ileum (10%) (5). Furthermore, duodenal adenocarcinoma is less common in the third part than in the second part of the duodenum (6). Patients with cancer in the third or fourth part of the duodenum usually presented after their third decade of life with symptoms of gastric outlet obstruction, anemia, and weight loss (3, 7). Our case presented with these symptoms in younger age (33 years old). The diagnosis of cancer of the third or fourth part of the duodenum remains challenging. In a series of 47 patients with adenocarcinoma of the third or fourth segment of the duodenum reported by Tocchi A et al. (7), the tumor was diagnosed barium swallow test of the gastrointestinal tract (80.9%) while upper gastrointestinal endoscopy had a 36% false negative result as the study was terminated before reaching the site of the lesion. Therefore, a high index of suspicion is warranted to establish the diagnosis in these cases.

The decision to treat this type of tumor with segmental resection with sparing of the pancreas or with pancreaticoduodenectomy is still controversial. Compared to pancreaticoduodenectomy, segmental resection of the tumor is considered to be safe and effective with no impact on survival (8, 9). Also, segmental resection is associated with a negligible rate of morbidity and mortality, while allowing for satisfactory margin clearance and adequate lymphadenectomy (7). Our patient underwent segmental resection of the tumor that achieved reaching free margins in all sites around the tumor. Moreover, he had a smooth postoperative course.

The role of adjuvant therapy in improving the overall survival remains unclear (5). In a meta-analysis of 15 studies of the role of adjuvant therapy in the management of small bowel adenocarcinoma, adjuvant therapy did not show a significant survival benefit (10). Several studies focused on the prognostic factors affecting the survival of patients with duodenal adenocarcinoma. Performing a curative surgery, lymph node metastasis, and tumor stage were common significant prognostic factors in these studies (6, 11, 12). Moreover, patients with more than three lymph nodes positive for metastasis had significantly reduced overall survival (13). The estimated 5-year survival rates reach 46.4% after curative surgery (12). In our patient, six out of thirteen lymph nodes were positive for metastasis. This may contribute to his development of soft tissue recurrence two years after the operation.

### 4. Conclusions

Adenocarcinoma of the third part of the duodenum is a rare malignancy that has its challenges in the diagnosis and management. Segmental resection is a safe and preferred surgical management for these cancers. Curative surgery and lymph node metastasis are the main factors affecting the overall survival of the patients.

### Acknowledgments:

This case was managed at King Fahd Hospital, Imam Abdulrahman Bin Faisal University, Alkhobar, Saudi Arabia. The case report was approved by the institutional review board at the university with IRB number 2015-01-148 on July 30, 2015. Thanks are conveyed to all who contributed to the management of the case, in particular, the gastroenterology, pathology, and oncology teams.

### Conflict of Interest:

There is no conflict of interest to be declared.

### Authors' contributions:

FMA and HMA conceptualized and designed the research project. HMA performed the data collection. All authors contributed to the analysis or interpretation of data. FMA and HMA drafted the manuscript. All authors revised the manuscript. All authors provided significant input in the manuscript, and read and approved the final version of it. All authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

### References:

- 1) Siegel RL, Miller KD, Jemal A. Cancer statistics, 2018. *CA Cancer J Clin.* 2018; 68: 7–30. doi: 10.3322/caac.21442. PMID: 29313949.
- 2) Pan SY, Morrison H. Epidemiology of cancer of the small intestine. *World J Gastrointest Oncol.* 2011; 3: 33–42. doi: 10.4251/wjgo.v3.i3.33. PMID: 21461167, PMCID: PMC3069308.

- 3) García-Molina FJ, Mateo-Vallejo F, Franco-Osorio J de D, Esteban-Ramos JL, Rivero-Henández I. Surgical approach for tumours of the third and fourth part of the duodenum. Distal pancreas-sparing duodenectomy. *Int J Surg*. 2015; 18: 143–8. doi: 10.1016/j.ijso.2015.04.051. PMID: 25917202.
- 4) Bilimoria KY, Bentrem DJ, Wayne JD, Ko CY, Bennett CL, Talamonti MS. Small Bowel Cancer in the United States. *Ann Surg*. 2009; 249: 63–71. doi: 10.1097/SLA.0b013e31818e4641. PMID: 19106677.
- 5) Halfdanarson TR, McWilliams RR, Donohue JH, Quevedo JF. A single-institution experience with 491 cases of small bowel adenocarcinoma. *Am J Surg*. 2010; 199: 797–803. doi: 10.1016/j.amjsurg.2009.05.037. PMID: 20609724.
- 6) Lee SY, Lee JH, Hwang DW, Kim SC, Park KM, Lee YJ. Long-term outcomes in patients with duodenal adenocarcinoma. *ANZ J Surg*. 2014; 84: 970–5. doi: 10.1111/ans.12112. PMID: 23656271.
- 7) Tocchi A, Mazzoni G, Puma F, Miccini M, Cassini D, Bettelli E, et al. Adenocarcinoma of the third and fourth portions of the duodenum: results of surgical treatment. *Arch Surg*. 2003; 138: 80–5. doi: 10.1001/archsurg.138.1.80. PMID: 12511157.
- 8) Cloyd JM, Norton JA, Visser BC, Poultides GA. Does the extent of resection impact survival for duodenal adenocarcinoma? Analysis of 1,611 cases. *Ann Surg Oncol*. 2015; 22: 573–80. doi: 10.1245/s10434-014-4020-z. PMID: 25160736.
- 9) Dorcaratto D, Heneghan HM, Fiore B, Awan F, Maguire D, Geoghegan J, et al. Segmental duodenal resection: Indications, surgical techniques and postoperative outcomes. *J Gastrointest Surg*. 2015; 19: 736–42. doi: 10.1007/s11605-015-2744-0. PMID: 25595309.
- 10) Ye X, Zhang G, Chen H, Li Y. Meta-analysis of postoperative adjuvant therapy for small bowel adenocarcinoma. *PLoS One*. 2018; 13: e0200204. doi: 10.1371/journal.pone.0200204. PMID: 30096150, PMCID: PMC6086425.
- 11) Chung WC, Paik CN, Jung SH, Lee KM, Kim SW, Chang UI, et al. Prognostic factors associated with survival in patients with primary duodenal adenocarcinoma. *Korean J Intern Med*. 2011; 26: 34–40. doi: 10.3904/kjim.2011.26.1.34. PMID: 21437160, PMCID: PMC3056253.
- 12) Kim MJ, Choi SB, Han HJ, Park PJ, Kim WB, Song TJ, et al. Clinicopathological analysis and survival outcome of duodenal adenocarcinoma. *Kaohsiung J Med Sci*. 2014; 30: 254–9. doi: 10.1016/j.kjms.2013.12.006. PMID: 24751389.
- 13) Liang TJ, Wang BW, Liu SI, Chou NH, Tsai CC, Chen IS, et al. Number of involved lymph nodes is important in the prediction of prognosis for primary duodenal adenocarcinoma. *J Chinese Med Assoc*. 2012; 75: 573–80. doi: 10.1016/j.jcma.2012.08.002. PMID: 23158035.