Adenocarcinoma mucoproducotor in Meckel’s diverticulum. Case report and review

ABSTRACT

Background: Meckel’s diverticulum is the most common congenital anomaly in the small intestine, which results from incomplete obliteration of the omphalomesenteric duct. Diagnosis is usually incidental, rarely showing bleeding, obstruction, diverticulitis or in rare cases neoplasm.

Clinic case: We present the case of a 67-year-old female whose condition evolved with urinary symptoms (dysuria, frequency, bladder tenesmus and straining). According to the study protocol a cystogram was performed and demonstrated a defect in the bladder dome edges with compression effect. Computed tomography reported a bladder-infiltrating hypodense lesion, which was decided to resect, revealing Meckel’s diverticulum with a tumor infiltrating the bladder dome. Histopathological report confirmed the diagnosis. Free but insufficient margins were obtained, and a reintervention was needed to increase margins. All the extension studies demonstrated no tumor activity.

Conclusions: Mucus-producing adenocarcinoma derived from a Meckel’s diverticulum is a clinical entity that because of its nonspecific symptomatology and variability of presentation is diagnosed incidentally on radiological images. The disease has a high mortality rate but a low prevalence.

Key words: Meckel’s diverticulum, adenocarcinoma.
BACKGROUND

According to Thirunavukarasu et al., in 1598 Fabricius Hildarus described the diverticulum in the small intestine (distal ileum) that later would receive the name of the German anatomist Johann Meckel who described its embryology in 1809. Meckel’s diverticulum is a true diverticulum, a remnant of the omphalomesenteric duct due to an incomplete obliteration.1,2 Meckel’s diverticulum is a common congenital anomaly of the gastrointestinal tract with a frequency of 2%. The predominant location in 90% of the cases is at 100 cm of the ileocecal valve and is ~3 cm in length.1,3

Various types of tumors derived from Meckel’s diverticulum have been described, of which the carcinoid is the most common. Other types include adenocarcinoma, pancreatic carcinoma, intraductal papillary neoplasm, GIST, leiomyosarcoma, lipomas, lymphomas, adenomyomas and villus adenomas.4,5

The coexistence of Meckel’s diverticulum implies an elevated risk of cancer because when the surface of the diverticulum is compared in relationship with that of the ileum, the risk of cancer is 70 times greater than in the rest of the ileum. This is based on what has been reported in a review of the Surveillance Epidemiology and End Results Program, which in a period of > 30 years found an incidence of 0.7 cases/100,000 inhabitants a year, which given a lifetime risk is 50-60 times greater in that population.6

Meckel’s diverticulum are asymptomatic except when there are concomitant complications, which have a lifetime incidence of ~4-6% and are hemorrhage (rare in patients < 30 years), intestinal obstruction and diverticulitis.7 The last two appear in 20% of patients with Meckel’s diverticulum who are symptomatic and is accompanied by a clinical syndrome that is impossible to differentiate from acute appendicitis (80%). In 0.5-3.2% of symptomatic Meckel’s diverticulum there are neoplasms, almost always carcinoid tumors.3

In the case of cancers of the small intestine, almost all are asymptomatic until the tumor grows to a sufficient size. Partial obstruction of the small intestine is the principal cause of concurrent symptoms: colicky-type abdominal pain, distention, nausea and vomiting.

Physical examination is of little use because it does not reveal information that points to the nosologic diagnosis, and 25% of patients with malignant neoplasms of the small intestine have a palpable abdominal tumor. The clinical picture is nonspecific for each type of tumor of the small intestine.7

The greater part of Meckel’s diverticulum are discovered as a finding on radiological images during endoscopy or during surgery. When there is no hemorrhage, Meckel’s diverticulum are rarely diagnosed before surgical intervention. For those who do have symptoms suggestive of Meckel’s diverticulum, it is difficult to obtain images for its confirmation.7

Because of the absence of specific cardinal symptoms, most neoplasms of the small intestine are rarely diagnosed before surgical intervention. Laboratory tests are nonspecific. In the case of carcinomas, they are accompanied by high CEA levels, but only when there is metastasis to the liver.

The usual imaging techniques may be used to rule out other pathologies or metastasis; however, there is a pathognomonic imaging study of this carcinoma. X-ray of the small intestine with contrast could show benign or malignant lesions with a sensitivity of 90% on detection of tumors of the small intestine and it is the study of choice for neoplasms of the distal small intestine.
Radionuclide scan (99mTc pertechnetate) aids in the diagnosis of Meckel's diverticulum but only has a positive result if the diverticulum contains ectopic gastric mucosa capable of uptake of the radionuclide. Its sensitivity is 90% in pediatric patients and < 50% in adults.

The sensitivity of computed tomography for detection of intraluminal or mucosal tumors is low, but it is useful for staging of intestinal malignancies. Tumors related with major hemorrhage are found with angiography or erythrocyte studies tagged with radioisotopes.7

Mucinous adenocarcinoma is diagnosed when > 50% of the tumor comprises a mucinous pattern on histological examination. It represents 6-20% of all colorectal cancers and differs from non-mucinous adenocarcinoma according to its clinical pathological characteristics, genetic profiles and pathogenic pathways.8

Surgical treatment of Meckel’s diverticulum consists of a diverticulectomy with excision of the bands that bind the diverticula to the wall of the abdomen or intestinal mesentery. If the diverticulectomy reveals hemorrhage, a segment resection of the ileum is carried out, which encompasses the diverticulum and adjacent ileal peptic ulcer. Segmentary ileal resection may be necessary if the diverticulum contains a tumor or if the base of the diverticulum is inflamed or perforated.7

In general, surgical treatment of malignant small intestine neoplasms tends to be wide resection of the intestine that contains the lesion. In the case of adenocarcinoma, a wide excision of the corresponding mesentery is done so as to achieve a regional lymphadenectomy as is done with adenocarcinomas of the colon. In case of locally advanced disease or metastasis, palliative resection of intestinal bypass is done. In the complementary or palliative treatment of carcinomas of the small intestine, the effectiveness of CT has not been demonstrated.7

The prognosis of mucinous adenocarcinoma has been a matter of discussion in previous studies. It is reported that the mucin can be an independent prognostic factor for survival. The directives established by the National Comprehensive Cancer Network do not describe the mucinous histological report as a clinical factor that should influence in the therapeutic algorithm; however, some studies report that mucous-producing adenocarcinoma is associated with poorer clinical pathological characteristics and poor prognosis.8 The general objective of this study is to report on a case of mucous-producing adenocarcinoma with a Meckel’s diverticulum.

CLINICAL CASE

We present the case of a 67-year-old female patient with a past medical history of systemic arterial hypertension, bilateral renal cysts, hiatal hernia, diverticula diagnosed by colonoscopy and recurrent urinary tract infections. Surgical history includes a cholecystectomy and hysterectomy due to myomatosis, both without complications.

The condition that is the reason for this report began in 2007 with dysuria, pollakiuria, cramps, and bladder urgency accompanied by colicky pain in the hypogastrium and output of gelatinous material through the urethra. The study protocol began with a cystogram that reported a defect at the dome of the bladder with irregular margins and compression effect. Cystoscopy reported permeable elastic urethra with symmetric trigone without lesions and horseshoe orthotopic meatus with clear urine. The floor, walls and fundus and neck were free of tumor or stones. In the bladder dome a 3-cm wide-base tumor with a vegetative appearance and with multiple sites of necrosis and vascular fragility was identified. Tomography of the abdomen reported liver with regular margins without evidence of lesions or tumors and a normal-appearing pancreas, calcifications in the abdominal aorta, Bosniak I left
renal cyst, normal right kidney, and infiltrating hypodense lesion on the dome of the bladder.

Preoperative laboratory reports were as follows: leukocytes 4.9 mil/µL, hemoglobin 13.2 g/dL, hematocrit 40.7%, platelets 209,000/µL, PT 13.2 sec, INR 1.04, PTT 32.1 sec, glucose 86 mg/dL, urea 22 mg/dL, creatinine 0.5 mg/dL, albumin 3.3 g/dL and LDL 547 U/L.

During surgery, adhesions were found in the space of Retzius that affected the dome and peritoneum. When adhesiolysis was done, a tumor of ~3 cm was found in the dome of the bladder that infiltrated the bladder wall (Figures 1 and 2) and continued up to a Meckel’s diverticulum which, on palpation of the distal portion of the diverticula, revealed another tumor of ~3 cm, two small peritoneal cysts and mucous-appearing fluid. It was decided to carry out a partial cystectomy with resection of the diverticulum with end-to-end anastomosis. During the postoperative course the patient was stable and without complications. She was discharged and continued to be followed as an outpatient.

The histopathological report was a well-differentiated mucous-producing adenocarcinoma with pannural invasion up to the serosa (Figure 3), 1.2 cm tumor, mouth of the diverticulum with surgical margin of 0.6 cm from margin of the neoplasm. Biopsy of the bladder wall reported a chronic-acute inflammatory process with reparative changes and wall fibrosis without evidence of infiltrating neoplasm.

Additional studies did not demonstrate metastasis or tumor activity. Two months later the patient was surgically intervened for the second time with the purpose of widening the margins. The bladder was found without evidence of tumor, with multiple adhesions, prior intestinal anastomosis.
in the ileum at 100 cm of the ileocecal valve, mesenteric tumor of $2 \times 2 \times 3$ cm in diameter at the level of the anastomosis without adenopathy. Resection was done 5 cm proximal and 5 cm distal to the site of the lesion with manual end-to-end anastomosis. Histopathological study reported margins free of lesion and negative inflammatory activity for malignancy.

The patient was discharged from the hospital in good general condition. She remained under outpatient physician monitoring and at 9 months of follow-up had no data suggestive of tumor activity or metastasis.

**DISCUSSION**

Meckel’s diverticulum is the most common anatomic variant of the gastrointestinal tract, which is characterized by complications in 4-6% of the cases, for example: bleeding, intestinal obstruction and diverticulitis. In addition, this type of anatomic variant has a high probability of becoming a neoplasm with an incidence of 0.5-3.2% with the carcinoid type being the most common. This is in contrast to our patient who was diagnosed with adenocarcinoma, which occupies the third place in frequency.$^3$

Generally, Meckel’s diverticulum is asymptomatic until the neoplasm increases in size, which frequently causes symptoms of intestinal obstruction. What is relevant in our case is its atypical presentation with urinary symptoms secondary to infiltration of the bladder by mucous-producing adenocarcinoma in Meckel’s diverticulum. On the face of these findings the decision was made to carry out a partial cystectomy with resection of the diverticulum with anastomosis. A re-operation was required to widen the margins, which was the best treatment option in this case for the patient because during follow-up there were no reports of tumor activity.$^3$ Due to the high risk of neoplasm of these tumors, Irunavukarasu,$^1$ Park,$^4$ and Lesquereux-Martínez et al.$^9$ recommend resection of the diverticulum when Meckel’s diverticulum is diagnosed as a finding and that, in addition, is associated with other risk factors such as age < 50 years, male gender, diverticular length of $>2$ cm and abnormal tissue histology. Cullen and Kelly$^10$ reported that the risk of complications from a diverticulum does not decrease with age and demonstrated that in the long-term the risks are less when incidental diverticulectomies are carried out. From the oncological point of view, such as with our case, a second surgical re-intervention was carried out to widen the margins of resection to remove abnormal tissue that can be found in up to 60% and only in 38% would a Meckel’s diverticulum be palpable in an asymptomatic patient. For this reason these recommendations are made because of the high potential of a curative resection and good long-term survival.$^1$

In conclusion, due to its low specificity of symptoms and variability of presentation, mucus-producing adenocarcinoma derived from a Meckel’s diverticulum is a clinical entity diagnosed as a finding in radiological studies. The manifestations are directly related with the degree and duration of the obstruction. This carcinoma has a high rate of mortality but a low prevalence, which adds to its not being well known and its high complexity.

**REFERENCES**


