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Meckel Diverticulum Carcinoid Tumor Complicated by Ileal Invagination. About One Case at Vichy Hospital

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Abstract

Meckel's diverticulum is a common pathology in children and rare in adults. We present a case of a 79-year-old patient in which a significant gastrointestinal bleeding, whose paraclinical explorations confirmed a fatty tumor of the terminal ileum. The exploratory coelioscopy revealed a tumor of the Meckel diverticulum complicated of intestinal invagination, resected at the same time with resection and extracorporeal anastomosis by mini coelio-guided laparotomy. Histology confirmed the presence of heterotopical tissue of the duodenal mucosa with Brunner cells and a carcinoid tumor. In conclusion, this clinical case shows that coelioscopy can be considered a very important diagnostic and therapeutic tool in this pathology especially in the elderly.

Keywords

Meckel's Diverticulum, Carcinoid Tumor, Invagination, Cœliosurgery

1. Introduction

Meckel's diverticulum (DM) is the most common congenital abnormality of the gastrointestinal tract (1% - 3%) of the population in autopsy studies and twice as frequently in the male sex [1] [2]. The risk of complications over the course of life is estimated at 4% in the form of digestive hemorrhage, occlusion, infection, or degeneration. The probability of complications occurring is highest before 2 years, about 1% around 40 years and still decreases to almost zero after 70 years [3] [4]. We report a case of intestinal invagination with carcinoid tumor of a Meckel diverticulum containing ectopic duodenal mucosa with Brunner glands in a 79-year-old patient.

2. Observation

It was a 79-year-old patient, admitted at the gastroenterology department for the management of a rectal haemorrhage complicated by iron deficiency anemia. He has a history of high blood pressure, hypothyroidism, radical prostatectomy in 2008 for localized prostatic adenocarcinoma, herniated disc in 2004 and 2005, left eye retinal central venous thrombosis in 2006 treated with hemodialysis. It also showed an NSTEMI with percutaneous coronary intervention in April 2020 (3 stents). He reported a jejunal and ileal angiodysplasia burned with argon plasma at the end of 2019. On clinical examination the patient was lethargic, with cutaneous pallor, cleavage angiomas, not hypertrichosis. The hemodynamic parameters were good with blood pressure 160/90mm Hg, pulse 98 beats/min, temperature 37.6˚C and BMI 34 kg/m^2. The abdomen was soft, painless, without palpable mass, no Troisier ganglion and a simple umbilical hernia. The rectal touch found no bleeding. The rest of physical examination was normal. The count and blood count showed normochrome anemia, normocytic with hemoglobin at 6.7 g/dl which was corrected by a blood transfusion of 3-unit packed cells and injectable iron. Kidney function, blood electrolytes and liver function were normal. The control bioassay showed a hemoglobin level of 10.2 g/dl and the rest of the blood count was normal with ferritin at 18. Esophagogastroduodenoscopy (EGD) found jejunal angiodysplasia coagulated to argon. An ileocolonoscopy found fresh blood in the last ileal loop without active hemorrhage found. The abdominal-pelvic CT-scan objectified a parietal thickening of 5 cm at the level of the terminal ileum centered on a 13 mm fatty element whose appearance evoked a lipoma with a significant adjacent thickening (**Figure 1**).

The video-capsule revealed an eroded surface lesion of sub-mucous surface about 15 cm from the caecum (**Figure 2**).

Faced with this chronic anemia refractory to transfusion and a suspected lesion of the mucosa of the terminal ileum, we planned a coelioscopy at the multidisciplinary consultation meeting. The patient was installed supine, under general anesthesia with orotracheal intubation. The CO_2 is breathed by open coelioscopy after a cutaneous incision supraumbilical and introduction of a trocar of 12 mm and the optics of 0˚. The intra-abdominal pressure is adjusted to 12 mm hg. Two 5 mm trocars under view control are introduced to the left iliac pit and left quadrant. After identification of the ileo-caecal valve, we examine the entire hail by unfolding loop by loop. This revealed the presence of a 15 cm long ileal invagination, located 50 cm from the ileo-caecal valve. We decided to make a mini laparotomy 5 cm across the right flank. Exteriorization of the invaginated ileum has been done. After reduction of the invagination, there was a Meckel diverticulum turned into a glove finger 8 cm long, based on implantation on the anti-mesenteric edge with a 2 cm ulcerated tumor at the tip of the diverticulum (**Figure 3**).

A 12 cm ileal section carrying the area reached by an endo-GIA 60 mm clamp and lymph node dissection of the superior mesenteric pedicle and a latero-lateral

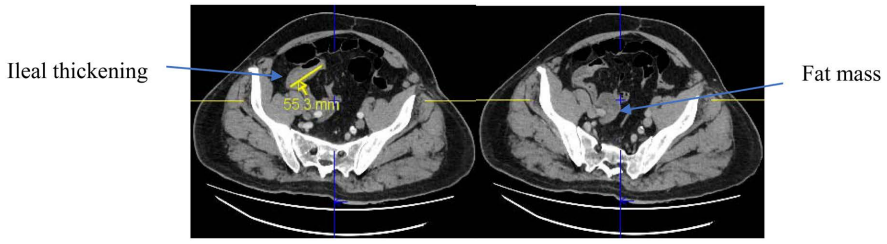

Figure 1. CT-Scanner showed a fat mass and ileal thickening evoking a lipoma ileal.

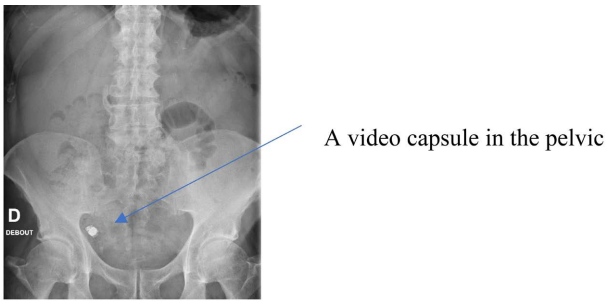

Figure 2. X-ray showed a video-capsule in the pelvic.

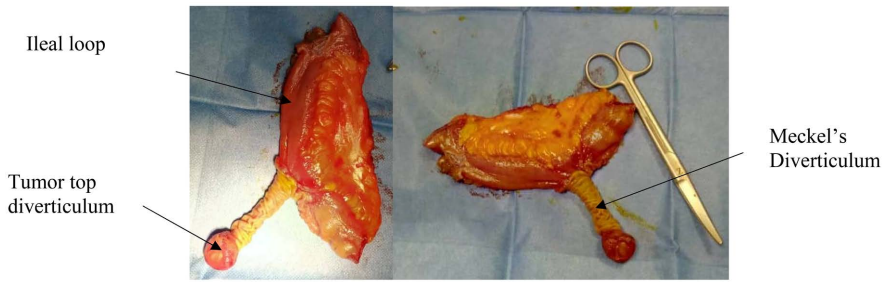

Figure 3. Specimen ileal segment showing the Meckel's diverticulum with a tumor in the top.

ileo-ileal anastomosis manual iso peristaltic with 2 overjets at PDS 2-0 was carried out. Intravenous antibiotic treatment (amoxicillin-clavulanic acid 3 g/d and metronidazole 1500 g/d) was started in intraoperative and continued until Day 5. The aftermath was simple with some episodes of food pain and vomiting on the 3rd day postoperative calmed by medical treatment. The checkup was normal. The patient was released on the 6th day after surgery. The macroscopic examination of the surgical room of a 12.6 cm ileal segment showed a diverticulum 3.5 cm long by 2 cm of diameter, which had a 2.3 cm diameter by 1.5 cm of height tumor at its tip, which was ulcerated by 1.2 cm of diametre. The appearance was rounded, although limited rather homogeneous. This diverticulum was located 5 cm from the first surgical cut and 7 cm from the second. In histology, the diverticulum was covered with ileal mucosa. In place, this mucous membrane presented duodenal metaplasia territories with Brunner glands. This mucous membrane was ulcerated at the tip of the diverticulum. Compared to the ulceration, within the mucous membrane, we observed a tumor proliferation of endocrinoid architecture, in the nest of round cells with granular chromatin sometimes orga-

nized in bays with a cytoplasm rich in eosinophil. The tumor proliferation reached the musculoskeletal gland which it infiltrated and protruded to extend to the sub-serous. Less than two mitoses were observed on 10 fields. The resection margins were healthy. At immunohistochemistry, Ki 67 was evaluated at 1%, chomogranin and synaptophysin were positive. The follow up of the patient was very well, without complications. He didn t need a add treatement.

3. Discussion

The DM represents a residual channel between the intestinal tract and the embryonic sac deriving from the incomplete obliteration of the omphalo-mesenteric channel, which normally obliterates between the 5˚ and the 7˚ week of life [5] [6]. It is rare and only 2% of the population carries it [4] [5]. It is a true diverticulum with all layers of the intestinal wall and is usually located at 70 - 100 cm from the ileo-caecal valve on the anti-mesenteric with its own mesentery and its own vascularization by a terminal branch of the superior mesenteric artery [4] [5] [6]. Most often asymptomatic, DM may be discovered incidentally in the course of an imaging examination or during surgery but can be revealed by a complication in 4% to 7% of cases [4] [6]. These complications occur in 60% in patients under 2 years of age and 3 to 4 times more frequently in men [4]. The DM responsible for a nonspecific panoply of symptoms is known as the "big simulator". Painless bleeding, periumbilical abdominal pain, repeated umbilical discharge, occlusive or sub-occlusive signs should evoke the diagnosis [1] [4]. Although bleeding is the most common complication in children, occlusion is indicative of 14% - 40% of symptomatic diverticula in adults [2] [4]. Among the various causes of occlusion, Meckel's diverticular invagination is the most common complication in the literature. The other causes are the diverticular volvulus or twisting around a meso-diverticular strip, an acquired flange, a Littre's hernia [4] [6]. The occurrence of invagination is linked to hyperperistalsis induced by DM especially if it is degenerated. DM, due to its mucous heterotopia, can give rise to many types of benign or malignant tumors. Malignant tumors represent only 0.5% to 3.2% of complications [1] [4] [6]. Several DM tumors have been described, with carcinoids being the most common. Adenocarcinomas, pancreatic carcinoma, intraductal papillary mucinous neoplasm, gastrointestinal stromal tumors, lymphomas, lipomas, and adenomas may occur on a DM [7]. The risk of developing a tumor on DM is 70 times greater than on any other segment of the small intestine [7]. Carcinoid tumors are the most common and account for two-thirds of the tumors developed on DM [4] [7]. DM carcinoid tumors had the best survival (243 months) compared to adenocarcinomas which were 13 months in the Thirunavukarasu study [7]. Although there is no consensus in the management of DMs, whether on the way first, the type of intervention, especially in case of incidental discovery, surgical treatment is the only option in the complicated form. Cœlioscopy can be of a valuable help especially in case of doubt diagnosis and the elderly. Surgical treatment can be entirely coelioscopic or cœlio-assisted de-

pending on the importance of intestinal resection required and the experience of the surgeon [4] [6]. A resection followed by an extracorporeal terminal-end anastomosis by a cœlio-assisted mini-laparotomy represents an ideal, minimally invasive and safe option [4] [5] [7] as was done in our case. The ileal resection must be wide enough to remove all abnormal or heterotopical tissue [4] [5].

4. Conclusion

Although representing the most common congenital malformation of the digestive tract, DM can have various complications, including bleeding, infection, perforation, occlusion, and degeneration. The carcinoid tumor of complicated DM invagination is a form rarely found in the literature. Most often, endoscopy, colonoscopy and more recently capsule endoscopy can highlight the diagnosis of bleeding. Coelioscopy can be useful in diagnosis and therapeutic management.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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