ANNALI ITALIANI DI CHIRURGIA

Digital Edition
e-publish on-line
ISSN 2239-253X
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Ann Ital Chir, 2021; 10 - Sept. 13
pii: S2239253X21036616
Online Epub

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Meckel's diverticulum as an occasional finding during major surgery. What to do? Case report and literature review

Meckel's Diverticulum is the most frequent congenital anomaly of the digestive system in the population, with a prevalence of 2% on results of a postmortem. Clinically, it can remain silent through all life, or it gets complicated in an acute abdomen sight.
In emergency, we can find Meckel's Diverticulum much more in childhood than in adult subjects, with a ratio of 2:1, and, therefore, it joins differential diagnosis with other pathologies being able to cause acute abdomen sight. In adult subjects that doesn't happen: usually, we can achieve the diagnosis sureness only during an exploratory laparotomy.
The Authors report the clinic case of a Meckel's Diverticulum found in a 78 years old patient during an exploratory laparotomy like accidental discovery.

KEY WORDS: Complications, Laparoscopy, Meckel's disease, Diverticulum

Introduction

Meckel's diverticulum is the most common congenital malformation of the gastrointestinal tract and its incidence is approximately 1% in the world population.
Although it is asymptomatic in 60-70% of cases, it can lead to symptoms in adulthood such as occlusion, bleeding, diverticulitis and intestinal perforation. The incidence of tumors resulting from Meckel's diverticulum is 0.5-3.2%.
The treatment of symptomatic Meckel's diverticulum is surgical resection, controversial is the indication for the treatment of asymptomatic Meckel's diverticulum (surgery or watchful waiting), while removal is generally indicated if detected during abdominal surgery for another pathology.

Pervenuto in Redazione Maggio 2021. Accettato per la pubblicazione Giugno 2021
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Case Report

A 55-year-old woman came to our hospital with anemia and abdominal pain. After routine examinations, CT scan and colonoscopy, colon cancer was found that required major surgery.
Already during the CT scan, the presence of a Meckel's diverticulum was highlighted, in this case asymptomatic. During the surgery, we identified the diverticulum and decided to remove it with a shot of a mechanical stapler.

Discussion

Meckel's diverticulum derives from the incomplete obliteration of the onphalon-mesenteric duct during fetal development. It appears as an extroflexion structurally similar to the intestine, located on the antimesenteric edge of the ileum, about 60 cm from the ileocecal valve. It is considered a "true diverticulum" as it consists of all the tissue layers making up the small intestine (mucosa, submucosa, muscle, serous). It has a variable length, on average from 5 to 8 cm, if very small it

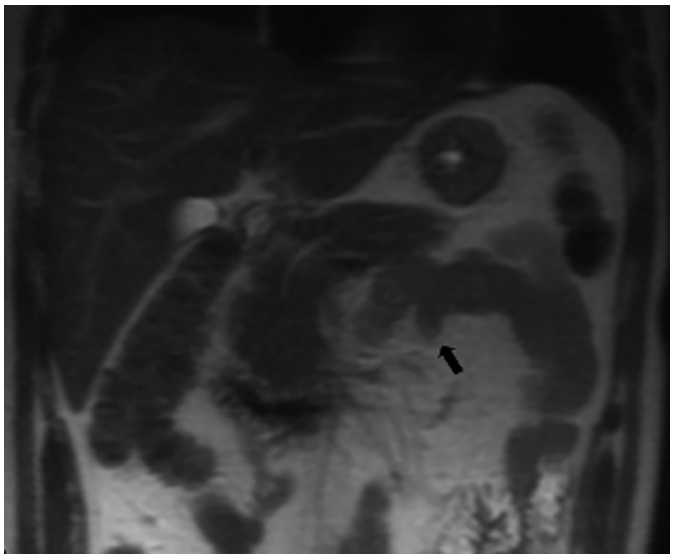

Fig. 1: TC Scan - Asymptomatic Meckel's diverticulum.

Fig. 2: Meckel's diverticulum found unexpectedly during laparotomic colon resection.

appears as a button-shaped protrusion of the intestinal wall.

It can contain ectopic colon, gastric or pancreatic tissue, and based on this it can lead to different symptoms in different age groups.

The presence of gastric ectopic tissue, the most common variant, releases non-neutralized HCl from pancreatic juices as normally occurs in the duodenum. This causes ulceration of the mucosa with consequent pain and bleeding 1.

In some cases, Meckel's diverticulum is connected by a thin fibrous band to the umbilical scar, which can result in intussusception or intestinal volvulus.

Long-term complications of Meckel's diverticulum are anemia and malignant transformation: various histotypes of neoplasia originate from Meckel's diverticulum, and in order of incidence the carcinoid (33-44%), leiomyosarcoma (18-25%), adenocarcinoma (12-16%) and finally GIST gastrointestinal stromal tumors (12%).

The treatment of symptomatic Meckel's diverticulum, for each age group, is surgery, performed with an open or laparoscopic technique.

The indication of removal of Meckel's diverticulum identified during surgery for another pathology (incidentaloma) is controversial.

In this regard, in 2006 a new approach was proposed based on a Risk Scale used to calculate the probability that Meckel's diverticulum may become symptomatic in the future: the risk factors identified were male, age less than 45 years, the length of the diverticulum greater than 2 cm and the presence of the fibrous band. A score greater than 6 suggested resection.

To find out the currents state of the art on the surgical approach of Meckel's diverticulum discovered during major surgery, we researched on Pubmed, and, in order to minimize statistical bias, only Observational Studies published in Pubmed from 1990 to the present date are considered, and all studies with less than 45 patients are excluded.

The Observational Studies present on Pubmed from 1990 to today, and which indicate to carry out, in any case, the resection of Meckel's diverticulum are a total of 9 studies, for a total of 2923 patients. The largest study is that of Matsagas et al., Which includes as many as 2074 patients; the study recommends resection regardless of the age and comorbidities of the patients.

The observational studies that conclude with the indication not to remove Meckel's diverticulum are 2, 137 patients in total. The most recent dates back to 2004, that of Stone et al., Which advises not to remove Meckel's diverticulum, and particularly for female patients.

There are 4 observational studies that recommend resection of Meckel's diverticulum only if associated with particular risk factors, for a total of 2050 patients. The risk factors considered are age, gender, comorbidities, the presence of diverticula, the location of or the presence of ectopic tissue in Meckel's diverticulum. The study with the largest number of patients is that of Park JJ et al., Who recruited 1,476 patients, and who recommended resection in patients who are less than 50 years of age, or who are men, or with diverticula greater than 2 centimeters or with suspicion of neoplastic tissue within Meckel's diverticulum.

Table I

1991	St-Vil D, Brandt ML, Panic S, Bensoussan AL, Blanchard H: Meckel's diverticulum in children: a 20-year review[8].	164 Patients	Recommend resection if ectopic mucosa is present or diverticulum is connected to mesentery via fibrous band
1994	Cullen JJ, Kelly KA, Moir CR, Hodge DO, Zinsmeister AR, Melton LJ: Surgical management of Meckel's diverticulum. An epidemiologic, population-based study.[2]	58 Patients	Recommend resection
1995	Peoples JB, Lichtenberger EJ, Dunn MM: Incidental Meckel's diverticulectomy in adults[3].	90 Patients	Does not recommend resection
1995	Matsagas MI, Fatouros M, Koulouras B, Giannoukas AD: Incidence, complications, and management of Meckel's diverticulum.[4]	2074 Patients	Recommend resection
2000	Chiu EJ, Shyr YM, Su CH, Wu CW, Lui WY: Diverticular disease of the small bowel[5].	88 Patients	Recommend resection
2001	Groebli Y, Bertin D, Morel P: Meckel's diverticulum in adults: retrospective analysis of 119 cases and historical review[6].	119 Patients	Recommend resection in male patients, less than 40 years old, based on the position of the diverticulum and whether it is palpable
2003	Onen A, Ciğdem MK, Oztürk H, Otçu S, Dokucu AI.: When to resect and when not to resect an asymptomatic Meckel's diverticulum: an ongoing challenge.[7]	74 Patients	Recommend resection in all children under 8 years old
2004	Stone PA, Hofeldt MJ, Campbell JE, Vedula G, DeLuca JA, Flaherty SK: Meckel diverticulum: ten-year experience in adults.[8]	47 Patients	Does not recommend resection
2005	Park JJ, Wolff BG, Tollefson MK, Walsh EE, Larson DR: Meckel diverticulum: the Mayo Clinic experience with 1476 patients (1950-2002).[1]	1476 Patients	Recommend resection in patients under the age of 50, or men, or with diverticula greater than 2cm or the presence of neoplastic tissue
2008	Zulfikaroglu B, Ozalp N, Zulfikaroglu E, Ozmen MM, Tez M, Koc M: Is incidental Meckel's diverticulum resected safely?[9]	76 Patients	Recommend resection
2011	Thirunavukarasu P, Sathaiah M, Sukumar S, et al.: Meckel's diverticulum--a high-risk region for malignancy in the ileum. Insights from a population-based epidemiological study and implications in surgical management.[2]	163 Patients	Recommend resection
2016	Gezer HÖ, Temiz A, İnce E, Ezer SS, Hasbay B, Hiçsönmez A: Meckel diverticulum in children: evaluation of macroscopic appearance for guidance in subsequent surgery.[10]	50 Patients	Recommend resection
2018	Chen Q, Gao Z, Zhang L, et al.: Multifaceted behaviour of Meckel's diverticulum in children.[11]	286 Patients	Recommend resection
2019	Demirel BD, Hancioglu S, Bicakci U, Bernay F, Aritürk E: Complications of Meckel's diverticulum in children: a 10-years' experience.[12]	62 Patients	Recommend resection
2019	Mora-Guzmán I, Muñoz de Nova JL, Martín-Pérez E: Meckel's diverticulum in the adult: surgical treatment.[13]	66 Patients	Recommend resection

Conclusion

From the studies we have considered, the indication for the surgical removal of Meckel's diverticulum discovered during surgery for another pathology is clear, especially by virtue of the most recent studies that increasingly converge for removal.

Certainly, the large number of complications to which the patient who has a Meckel's diverticulum can be exposed has tipped the scales towards removal; from

ulceration to neoplastic transformation. Another important consideration is that, going to operate a patient who has undergone major intestinal surgery again multiplies the surgical risks, and for this reason the risk of new operations must be minimized, and Meckel's diverticulum represents an important one.

Riassunto

Il Diverticolo di Meckel è l'anomalia congenita dell'apparato digerente più frequente nella popolazione, con una prevalenza del 2% sui risultati di un'autopsia. Clinicamente, può rimanere silente per tutta la vita, o complicarsi in una vista acuta dell'addome.
In emergenza, possiamo trovare il Diverticolo di Meckel molto più nell'infanzia che nei soggetti adulti, con un rapporto di 2:1, e, quindi, è necessario effettuare diagnosi differenziale con altre patologie che possono causare l'addome acuto. Nei soggetti adulti questo non accade: di solito, possiamo raggiungere la certezza della diagnosi solo durante una laparotomia esplorativa.
Gli Autori riportano il caso clinico di un Diverticolo di Meckel trovato in un paziente di 78 anni durante una laparotomia esplorativa come, quindi, incidentaloma.

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