

MECKEL'S DIVERTICULUS IN CHILDHOOD: LITERATURE REVIEW

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Abstract: introduction: Meckel's diverticulum (DM) is caused by an embryonic failure where the closure of the omphalomesenteric duct does not occur during pregnancy. Most patients are asymptomatic until the diverticulum becomes pathological. There may be abdominal pain and gastrointestinal bleeding, even resulting in anemia, the most common symptomatology being bleeding secondary to an ulceration caused by acid secretion due to ectopic gastric mucosal tissue. The treatment for symptomatic Meckel's is surgical, and laparoscopic or open diverticulectomy must be performed. Segmentectomy with primary anastomosis may be necessary, depending on the size of the diverticulum and the condition of the bowel.

Objective and methodology: To review the literature about Meckel's diverticulum in childhood. The methodology consisted of a bibliographic survey in the Scielo and Pubmed databases, from 2000-2020. **Results and conclusion:** Meckel's diverticulum (DM) is a rare embryological remnant, which usually remains asymptomatic in childhood. Clinically, the most common presentations of symptomatic diverticulum are abdominal pain resulting from intestinal obstruction and painless bleeding. Still, diagnosis is challenging due to clinical and imaging overlap with other inflammatory conditions of the abdomen.

Keywords: Meckel, diverticulum, diverticulectomy.

INTRODUCTION:

Meckel's diverticulum (DM) is caused by an embryonic failure where the closure of the omphalomesenteric duct does not occur during the 5th week of pregnancy. This channel is responsible for connecting the yolk sac to the midgut. The persistence of this communication leads to the formation of several anomalies, including DM, persistence of the omphalomesenteric conduit, fibrous

band, polyp and umbilical cyst. DM is a true diverticulum, containing all layers of the intestinal wall (BIDARMAGHZ 2019).

According to the “rule of 2” when it comes to Meckel’s diverticulum, it is observed to occur in about 2% of the population, 2 boys for every 1 girl, normally discovered before 2 years of age, located 2 feet (60 cm) of the ileum-cecal valve, is usually 2 cm in diameter and 2 inches (5 cm) long, and may contain 2 types of heterotopic mucosa, the most common being gastric, followed by pancreatic and intestinal mucosa. (LIN, et al 2017; ASHCRAFT 2014).

Most patients are asymptomatic until the diverticulum becomes pathological. There may be abdominal pain and gastrointestinal bleeding, even resulting in anemia, in addition to some rarer complications such as: intestinal obstruction, intussusception, perforation and inflammation (LIN, et al 2017). However, the most common symptomatology is bleeding secondary to an ulceration caused by acid secretion due to an ectopic gastric mucosal tissue (BIDARMAGHZ 2019).

The main causes of symptomatic Meckel’s diverticulum are intestinal obstruction, gastrointestinal bleeding and inflammation of the diverticulum with or without perforation (HANSEN 2018).

The accidental diagnosis of DM occurs if the patient is asymptomatic and the diverticulum is accidentally found during surgery unrelated to the anomaly. If the patient is symptomatic, initially the symptomatology must be evaluated and related to the clinical pathology. The tests used in the diagnosis include technetium-99m scintigraphy, ultrasonography, angiography and capsule endoscopy (Lin et al., 2019).

The treatment for symptomatic Meckel’s is surgical, and laparoscopic or open diverticulectomy must be performed. Segmentectomy with primary anastomosis may be necessary, depending on the size of

the diverticulum and the state of the bowel. Diverticulum resection as an accidental finding remains controversial.

Meckel’s diverticulum (MD) is a rare embryological remnant, which usually remains asymptomatic in childhood. It is an important differential diagnosis in patients with gastrointestinal obstruction or bleeding. Clinically, the most common presentations of symptomatic diverticulum are abdominal pain resulting from intestinal obstruction and painless bleeding. Still, diagnosis is challenging due to the overlap of clinical and imaging studies with other inflammatory conditions of the abdomen. Particularly in childhood, one must always raise the suspicion of DM in cases of painless gastrointestinal bleeding and recurrent intestinal invaginations. Due to the varied clinical manifestations in the pediatric age group, DM remains a diagnostic challenge for pediatricians and also for pediatric surgeons.

OBJECTIVE AND METHODOLOGY:

To review the literature about Meckel’s diverticulum in childhood. The methodology consisted of a bibliographic survey in the Scielo and Pubmed databases, from 2000-2020.

RESULTS:

Meckel’s Diverticulum (MD) is a cause of abdominal pain, as well as intestinal obstruction and abdominal bleeding. Only 4% of people will experience symptoms in their lifetime. There is no familial predisposition, but the prevalence increases in children with neoplasms, omphalocele and gastroschisis or malrotation (KEESE 2019).

The most common symptomatology in the pediatric population is bleeding secondary to ulceration in the heterotopic mucosa with or without abdominal pain (BIDARMAGHZ

2019), however obstruction is the most frequent complication in symptomatic pediatric cases, being reported by PARK 2005 and KEESE 2019. The most common heterotopic type is gastric, present in 29% of all diverticula (PARK 2005) reaching 60% (KEESE 2019) followed by pancreatic. The presence of heterotopic tissue continues as a cause of possible complication of DM. Imaging diagnosis takes computed tomography into account, as abdominal X-rays and ultrasonography are of no benefit. Technetium 99 -Tc-99m- scintigraphy remains the most sensitive, around 80% sensitivity and up to 95% specificity in children (uptake of the radioisotope by the heterotopic gastric mucosa (LIN 2017). Capsule endoscopy can be used for the diagnosis, since the search for occult bleeding is among its indications (LIN 2019). Double balloon enteroscopy can also be used, being superior to the capsule, as it does not depend on the angle of the camera (LIN 2019). In diverticula Intraoperative accidental cases, controversy over removal continues. Recommendation for resection must be based on previous symptomatology and those with palpable mass, diverticulectomy resection margin must be wide, in others, simple diverticulectomy must suffice (PARK 2005). advocate that accidental diverticula must be removed to avoid future complications, especially those with palpable mucosa (“mass”) or fibrous bands (LIN 2017).

Treatment of symptomatic diverticula via laparotomy or laparoscopy (which also serves as a diagnosis) consists of diverticulectomy or intestinal segmental resection, depending on the size of the diverticulum and the situation of the intestinal loop, as well as the presence of heterotopic mucosa.

CONCLUSION:

Meckel’s diverticulum (DM) is a rare embryonic remnant, caused by an embryonic failure where the closure of the omphalomesenteric duct does not occur during the 5th week of gestation.

The literature maintains the “rule of 2” when it comes to Meckel’s diverticulum: it is observed that it occurs in about 2% of the population, 2 boys for every 1 girl, normally discovered before 2 years of age, located 2 feet (60 cm) of the ileum-cecal valve, is usually 2 cm in diameter and 2 inches (5 cm) long, and may contain 2 types of heterotopic mucosa.

Although usually asymptomatic in childhood, it is an important differential diagnosis in patients with gastrointestinal obstruction or bleeding.

Diagnosis remains a challenge due to the overlap of clinical and imaging studies with other inflammatory conditions of the abdomen. Particularly in childhood, one must always raise the suspicion of DM in cases of painless gastrointestinal bleeding and recurrent intestinal invaginations.

REFERENCES

- 1) Ashcraft's pediatric surgery, 6th Ed, 2014 pp 548-52
- 2) Bidarmaghz, B., McGregor, H., Raufian, K., & Tee, C. L. (2019). **Perforation of the Meckel's diverticulum with a chicken bone: a case report and literature review.** *Surgical case reports*, 5(1), 15. <https://doi.org/10.1186/s40792-019-0577-x>
- 3) Hansen CC, Søreide K. **Systematic review of epidemiology, presentation, and management of Meckel's diverticulum in the 21st century.** *Medicine (Baltimore)*. 2018;97(35):e12154. doi:10.1097/MD.00000000000012154
- 4) Keese D, Rolle U, Gfroerer S, Fiegel H. **Symptomatic Meckel's Diverticulum in Pediatric Patients-Case Reports and Systematic Review of the Literature.** *Front Pediatr*. 2019;7:267. Published 2019 Jun 26. doi:10.3389/fped.2019.00267
- 5) Lin XK, Huang XZ, Bao XZ, Zheng N, Xia QZ, Chen CD. **Clinical characteristics of Meckel diverticulum in children: A retrospective review of a 15-year single-center experience.** *Medicine (Baltimore)*. 2017;96(32):e7760. doi:10.1097/MD.00000000000007760
- 6) Lin L, Liu K, Liu H, Wu J, Zhang Y. **Capsule endoscopy as a diagnostic test for Meckel's diverticulum.** *Scand J Gastroenterol*. 2019;54(1):122-127. doi:10.1080/00365521.2018.1553353
- 7) Park JJ, Wolff BG, Tollefson MK, Walsh EE, Larson DR. **Meckel diverticulum: the Mayo Clinic experience with 1476 patients (1950-2002).** *Ann Surg*. 2005;241(3):529-533. doi:10.1097/01.sla.0000154270.14308.5f