Case report

OMPHALOMESENTERIC DUCT REMNANT ABNORMALITIES – A CASE OF MECKEL DIVERTICULUM

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Summary
Omphalomesenteric duct malformations range from completely patent omphalomesenteric duct at the umbilicus to a variety of lesser remnants including cysts, fibrous cords connecting the umbilicus to the distal ileum, granulation tissue at the umbilicus, umbilical hernias, and Meckel's diverticulum. Regression of the duct occurs as a normal embryonic event in the intrauterine life between the fifth and ninth weeks of gestation. In our case, the dissection reveals a Meckel's diverticulum in a mesenteric location, which is a distinct variation that differs from the cardinal findings of the antimesenteric location of this abnormality. Though asymptomatic and still controversial about its removal we believe that Meckel's diverticulum in a mesenteric location is a forgotten or underestimated variant that is difficult to distinguish from an ileal duplication.
Key words: vitelline duct, Meckel diverticulum, abnormalities.

Introduction
A Meckel's diverticulum, a true congenital diverticulum, is a small bulge in the small intestine present at birth. It is a vestigial remnant of the omphalomesenteric duct (also called the vitelline duct), and is the most frequent malformation of the gastrointestinal tract. It is present in approximately 2% of the population, with males more frequently experiencing symptoms and causing complications. The latter are reported in approximately 4–40% of patients such as inflammation (diverticulitis), hemorrhage from peptic ulceration, perforation, intussusception, intestinal obstruction, stone formation, and neoplasm [1].

A memory aid is the rule of 2's: 2% (of the population) - 2 feet (from the ileocecal valve) - 2 inches (in length) - 2% are symptomatic, there are 2 types of common ectopic tissue (gastric and pancreatic), the most common age at clinical presentation is 2, and males are 2 times as likely to be affected.

It was first described by Fabricius Hildanus in the sixteenth century and later named after Johann Friedrich Meckel, who described the embryological origin of this type of diverticulum in 1809 [2].

Embryological Basis
If either the vitelline duct or the allantois fail to involute normally, the remnant structures can be classified into three basic types [3]: (a) in the type 1 remnant, the entire duct remains patent; (b) in the type 2 remnant, one or the other end of the duct remains patent; and (c) in the type 3

remnant, only a midportion remains patent [4].

When the proximal portion of the vitelline duct is persistently patent, the resulting abnormality is referred to as a Meckel diverticulum. This anomaly is the most common type of umbilical remnant and has an estimated overall prevalence of 0.2%-3%, determined on the basis of autopsy studies [5].

Omphalomesenteric duct malformations range from completely patent omphalomesenteric duct at the umbilicus to a variety of lesser remnants including cysts, fibrous cords connecting the umbilicus to the distal ileum, granulation tissue at the umbilicus, umbilical hernias, and Meckel's diverticulum [6]. Regression of the duct occurs as a normal embryonic event in the intrauterine life between the fifth and ninth weeks of gestation [7].

Case presentation

The finding was observed during student dissection of an old female cadaver after disclosing the abdominal cavity. The authors used surgical caliper to do the standard measurements.

The dimensions of the diverticulum were 22 mm in its widest part and 19 mm along the left and 28 mm along the right margin. A small strip of double layer of peritoneum resembling "mesenteriolum" was established on the right side of the diverticulum and it was continuous with the mesenterium at the base of the structure. It was interesting that the Meckel's diverticulum was unusually located and wedged into the mesenteric side of the ileum (Fig. 1).

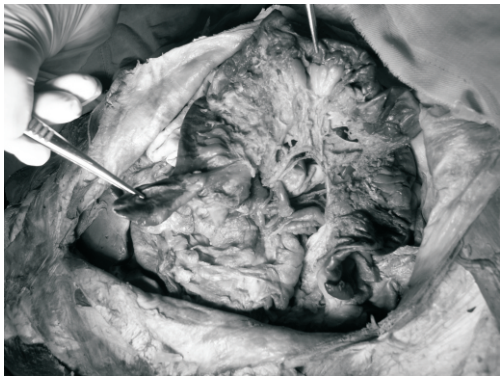

Figure 1. Meckel's diverticulum wedged into the mesenteric border of the ileum

Discussion

The antimesenteric location is emphasized as one of the cardinal findings in defining the Meckel's diverticulum [8]. The first description in a different location other than mesenteric_location was reported in 1941. Segal and colleagues recently described a case of Meckel's diverticulum in a mesenteric location that presented as an inflammatory mass. They considered enterogenous cyst in the differential diagnosis and favoured the diagnosis of Meckel's diverticulum. They emphasized that the mesenteric location of Meckel's diverticulum is a forgotten entity [9].

In our case, the dissection reveals a Meckel's diverticulum in a mesenteric location, which is a distinct variation that differs from the principal findings of the antimesenteric location of this abnormality.

Conclusions

Though asymptomatic and still controversial about its removal we believe that Meckel's diverticulum in a mesenteric location is a forgotten or underestimated variant that is difficult to distinguish from an ileal duplication.

References

1. Elsayes KM, Menias CO, Harvin HJ, Francis IR. Imaging manifestations of Meckel's diverticulum. Am J Roentgenol. 2007;189(1):81–8.
2. Meckel JF. Über die Divertikel am Darmkanal. Archiv für die Physiologie. Halle. 1809;9:421-53.
3. DiSantis DJ, Siegel MJ, Katz ME. Simplified approach to umbilical remnant abnormalities. Radiographics. 1991;11(1):59-66.
4. Lowman RM, Waters LL, Stanley HW. The roentgen aspects of the congenital anomalies in the umbilical region. Am J Roentgenol. 1953;70:883-910.
5. Maglinte DDT, Elmore MF, Isenberg M, Dolan PA. Meckel diverticulum: radiologic demonstration by enteroclysis. Am J Roentgenol. 1980; 134:925-932.
6. Moore TC. Omphalomesenteric duct malformations. Semin Pediatr Surg. 1996;5(2):116-23.
7. Gangopadhyaya AN, Upadhyaya VD, Sharma SP, Kumar V. Spontaneous regression of patent omphalo-mesenteric duct. Indian J Gastroenterol. 2007;26(3):140-1.
8. Donellan WL. Meckel's diverticulum and related anomalies. In: Donellan WL, Burrington JD, Kimura K, Schafer JC, White JJ, editors. Abdominal surgery of infancy and childhood. Luxembourg: Harwood Academic Publishers; 2001. p. 41/1-41/12.
9. Segal SD, Albrecht DS, Belland KM, et al. Rare mesenteric location of Meckel's diverticulum, a forgotten entity: a case study aboard USS Kitty Hawk. Am Surg. 2004;70:985-8.