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Hernia

Incarcerated ventral (epigastric) hernia containing a strangulated Meckel's diverticulum

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Summary: A Meckel's diverticulum is the result of an incomplete obliteration of the omphalomesenteric, or vitelline, duct. The duct connects the midgut to the yolk sac of the developing intestinal tract and normally atrophies by the eighth to ninth week of gestation. This event fails to occur in approximately two percent of the population, resulting in the congenital anomaly named after Johann Friedrich Meckel, who first characterized this diverticulum in 1809. Our patient presented with signs and symptoms consistent with a small bowel obstruction secondary to an incarcerated hernia, and underwent emergent laparotomy. An ischemic small bowel segment with a Meckel's diverticulum was resected. Pathology revealed ectopic pancreatic tissue within the diverticulum. Meckel's diverticula have been observed among the contents of hernia sacs in various locations including the inguinal, femoral, and umbilical regions. We report a case of a Meckel's diverticulum presenting in a spontaneous ventral (epigastric) hernia.

Key words: Hernia — Ventral — Incarcerated — Meckel's diverticulum — Littre's hernia

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Meckel's diverticulum is the most common congenital anomaly of the small intestine and perhaps of the entire intestinal tract [Haber 1947]. The majority of these diverticula do not give rise to any clinical symptoms and are encountered incidentally at operation or autopsy. These vitelline duct remnants are subject to any pathology that may occur in the small intestine, including tumor, hemorrhage, ulceration, inflammation, obstruction, strangulation, and herniation. Herniation of a Meckel's diverticulum is an exceedingly rare occurrence. Approximately ninety percent of Meckel's hernias are in the inguinal, femoral, or umbilical region with other locations accounting for the remaining occurrences [Watson 1948, Bird 1943, Gray 1934]. To our knowledge, this is the first report of a Meckel's diverticulum presenting in a spontaneous ventral (epigastric) hernia.

Case report

An obese, fifty-two year old male presented to the Emergency Room with an incarcerated ventral hernia. Two days prior to admission, the hernia became progressively more firm and painful, and was accompanied by anorexia, fever, chills, nausea, and finally vomiting. On physical examination, a 30x28x18 cm midline epigastric hernia was firm, non-reducible, and tender to light palpation. The remainder of his physical exam was unremarkable.

His WBC count on admission was 5,000/mm^3. Abdominal and pelvic films revealed air fluid levels, dilated loops of small bowel, thickened small bowel mucosal folds, and bowel outside the abdominal cavity within a hernia sac. There was no free air.

A diagnosis of small bowel obstruction secondary to an incarcerated ventral (epigastric) hernia was made. Laparotomy revealed a markedly attenuated fascia over a supraumbilical abdominal wall defect, approximately ten centimeters in diameter. Serosanguinous ascites was noted upon entering the hernia sac, together with a Meckel's diverticulum approximately four centimeters in length, with adjacent infarcted small bowel (Fig. 1). The sac contained the majority of the gastrocolic omentum and the transverse colon. A smaller epigastric defect (cephalad) and an umbilical hernia were also detected. A 13 centimeter ischemic small bowel segment containing the Meckel's diverticulum was resected, along with a portion of ischemic omentum. A side-to-side stapled ileo-ileostomy was performed, and the fascial edges of the epigastric hernia were exposed and re-approximated using interrupted polypropylene sutures. A drain was placed within the subdermal cavity and the skin was approximated using staples. After an unremarkable post-operative course, the patient was discharged from the hospital on post-operative day six.

The resected small bowel and the Meckel's diverticulum revealed scattered areas of hemorrhage and infarction, with submucosal edema and hemorrhage, necrotic muscularis propria, and a variable appearance (viable to necrotic and sloughed) of the surface epithelium. No perforation was evident. Within the diverticular mucosa were multiple rests of ectopic pancreatic tissue, exocrine pancreatic ducts and acinar glands, and scattered poorly differentiated islets (Fig. 2).

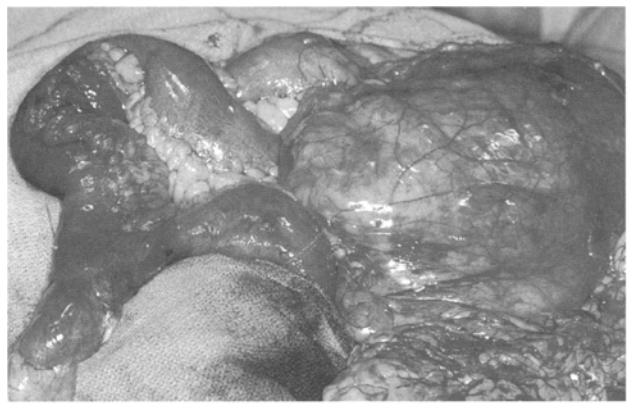

Fig. 1
Intra-operative photograph demonstrating hernia sac, segment of ischemic small bowel, and adjacent Meckel's diverticulum

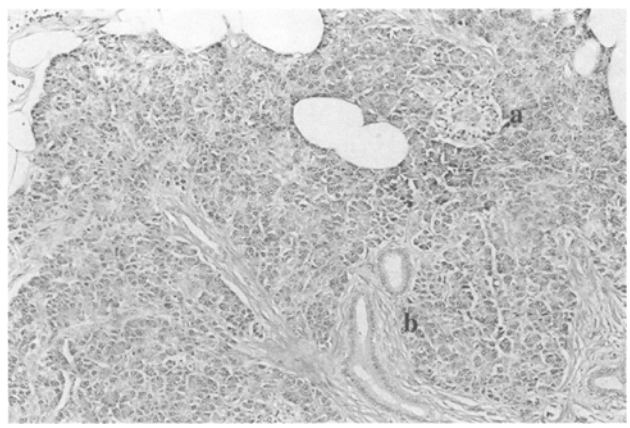

Fig. 2
Section of distal tip of Meckel's diverticulum showing ectopic pancreatic tissue: a, pancreatic acinus and b, islet of Langerhaans (hematoxylin-eosin stain; magnification X 100)

Discussion

While Meckel's diverticulum is a relatively common anomaly, herniation of these embryologic remnants is an exceedingly rare event. A Meckel's diverticulum is not likely to be observed within a ventral hernia for several reasons: a) the base of the small bowel mesentery is tethered, b) the location of a Meckel's diverticulum is in the distal ileum, and c) the supraumbilical location of an often moderate sized fascial defect which occurs with ventral hernias. These factors minimize the likelihood of finding a single diverticulum within a facial defect without any adjacent or accompanying bowel or viscera (ie. Littre's hernia). In addition, most patients are asymptomatic from their diverticuli, and therefore the diagnosis is seldom made pre-operatively [Littre 1709].

Our patient's ventral herniorrhaphy consisted of identification, exposure, and vertical approximation of an intact fascial edge bilaterally. A tension-free type repair using non-absorbable mesh would have been preferable [Young 1994], especially in the presence of obesity, multiple fascial defects, and a large, primary defect, (which increases the risk of recurrence to greater than 40% [Hesselink 1993]). However, the presence of necrotic bowel, with subsequent resection and anastomosis, would have significantly increased the likelihood of a prosthetic infection. If the defect were of such magnitude so as to preclude direct fascial approximation, several other methods of abdominal wall reconstruction could have been performed [Shaw 1990]. The option of mesh repair, should the hernia recur, would still be available.

Direct complications from a Meckel's diverticulum, such as bleeding or obstruction, would be an indication for a partial small bowel resection. If the small bowel within the hernia sac was not ischemic and the Meckel's diverticulum was not bleeding or obstructing, then it would not be so apparent whether segmental resection was indicated, given that the diverticulum was broad based with palpable ectopic mucosa. A laparoscopic approach, despite its lower overall morbidity [Hasizume 1996], may not clarify or simplify the optimal surgical maneuver due to limited visibility and a decrease in tactile sensation.

To our knowledge, this case report is the first documentation of a Meckel's diverticulum within a spontaneous ventral hernia. The factors which must be considered in the surgical management of such patients include the type of hernia repair to employ, whether or not to resect the Meckel's diverticulum, and whether an open or laparoscopic approach is more appropriate.

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