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An Umbilical Polyp in an Infant

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The persistence at birth of the omphalomesenteric (vitelline) duct may result in life-threatening consequences. Early identification of this congenital anomaly is essential for prompt surgical treatment to eliminate the risk of prolapse and herniation. A neonatal umbilical polyp may indicate the presence of an omphalomesenteric duct remnant. We describe the diagnosis and surgical treatment of an infant with an umbilical polyp. We also present an overview of the diagnosis and treatment of vitelline duct remnants and their associated anomalies.

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In early embryogenesis, the vitelline duct connects the alimentary canal and the yolk sac. By the time of birth, this communication channel is usually obliterated. However, remnants of the embryonic communication may persist as a lesion on the umbilicus that is called an omphalomesenteric (vitelline) duct remnant. The lesion should be recognized and treated early because of its potential to coexist with life-threatening anomalies.

Case Report

A 3-month-old girl was referred to the dermatology clinic for evaluation of a nonhealing umbilical remnant. Her mother reported persistent drainage and occasional bleeding from the site. The results of a physical examination revealed an otherwise healthy infant with a bright cherry-red, glistening, 1-cm nodule on the umbilicus (Figure 1).

Results of a microscopic evaluation of a shave biopsy specimen showed a vitelline duct

remnant composed of a polypoid nodule with a squamocolumnar junction. The glandular component was composed of mucous cells and occasional Paneth granular cells (Figure 2). The underlying lamina propria was composed of lymphoid follicles, neutrophils, and eosinophils with ectatic vessels. Beneath it were bundles of smooth muscle fibers and a fibrovascular stroma. This glandular component abruptly abutted squamous epithelium.

The patient was referred for exploratory surgery. During laparotomy, no evidence was found of an associated Meckel diverticulum, an omphalomesenteric duct, or a patent urachus. The umbilical nodule was excised, and its base was cauterized. The patient recovered uneventfully.

Comment

Early in human embryogenesis, the alimentary canal communicates with the yolk sac through the umbilicus. As the embryo grows, the communicating omphalomesenteric duct narrows; by the fifth week of gestation, it is surrounded by the growing umbilical cord.¹ The duct normally loses any vestige of its former existence and disappears by about the sixth week.¹

Under abnormal conditions, part of the omphalomesenteric duct persists, resulting in anomalies. The most common may be Meckel diverticulum, which occurs in about 2% of the population.² This remnant is found 30 to 60 cm proximal to the adult ileocecal junction on the antimesenteric surface of the small bowel. It may be connected to the umbilicus through a fibrous tract. Other anomalies include a stand-alone fibrous tract, cysts within that tract or within the abdominal wall at the umbilicus, an umbilical sinus, or an external polyp at the umbilicus.² Cysts within the fibrous tract may migrate into the umbilical cord and cause fetal death.³ Finally, the remnant may persist as an open umbilical enteric fistula or a patent vitellointestinal duct connecting the lumen

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Figure 1. An omphalomesenteric polyp.

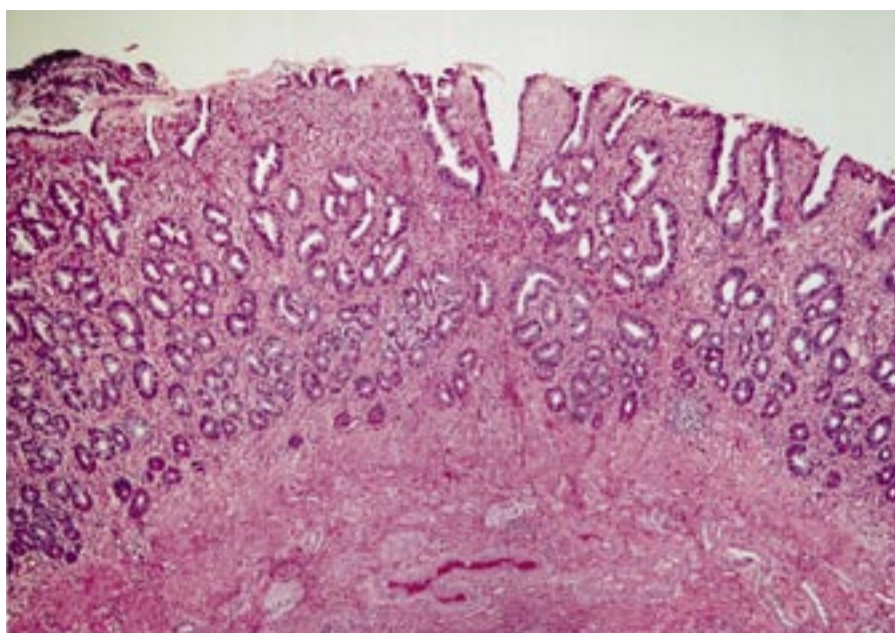


Figure 2. Gastriclike mucosa with goblet cells shows overlying granulation tissue (H&E, original magnification $\times 100$).

of the small intestine to the external surface through the umbilicus.⁴

The patent omphalomesenteric duct is the most problematic vitelline remnant. This lesion affects infant boys 8 times as often as it does infant girls.⁵ In 1786, in one of the earliest reports, Hamilton⁶ noted the passage of *Ascaris lumbricoides* through the duct; in 1941, Mikhelson⁷ described a similar worm expulsion. The presence of gas or fecal material at the navel is adequate presumption of a vitelline communication. Diagnosis can be verified by probing, which risks

perforation, or by sinography with suitable contrast medium.⁸

A confirmed patent omphalomesenteric duct, especially a short one, is considered a surgical emergency because of its high risk of prolapse and herniation. Kittle et al⁸ found 27 cases of prolapse in 131 patients. Almost all reported cases occurred in infants younger than 6 months; most of these infants had prolapse the first month after birth.⁵ Prolapse starts with increased intra-abdominal pressure when the infant coughs, cries, or strains.⁹

Differential Diagnosis of Vitelline Umbilical Remnant*

Vitelline remnant
Umbilical (pyogenic) granuloma
Vascular neoplasms, including sarcomas and congenital hemangiomas
Patent urachus
Ligated umbilical hernia
Capillary hemangioma

*Definitive diagnosis requires pathologic findings.

Four degrees of prolapse are recognized: (1) simple mucosal protrusion, (2) moderate prolapse, (3) complete prolapse of the duct and herniation of the ileum, and (4) complete prolapse of the duct and prolapse of the ileum.¹⁰ After prolapse and eversion of the ileum into the hernia, peristalsis and antiperistalsis continue the process, until 10 cm or more of everted ileum is prolapsed.⁹ Ileal prolapse is difficult to reduce and invariably necessitates resection of the small intestine.¹ Soutar et al⁹ advocated surgical exploration and resection of a patent duct in infants with intestinal mucosa on the umbilicus. Nursal et al¹¹ reported successful laparoscopic resection of a patent omphalomesenteric duct in an adult patient. There also are rare reports of spontaneous regression of a patent omphalomesenteric duct.¹²

External remnants of the omphalomesenteric duct occur as a bright-red polyp. The polyp may communicate with a patent duct or sinus. Mucosal secretions give it a sticky surface. When gastriclike glandular elements are present, the polyp may be surrounded by severely erosive irritant contact dermatitis. For uncomplicated polyps, surgical excision may be adequate.¹³

Pathologic diagnosis requires the presence of ectopic gastrointestinal epithelium. Steck and Helwig¹ reviewed 40 cases of omphalomesenteric remnant at the Armed Forces Institute of Pathology. Fourteen of these patients were adults. Thirteen of the 40 patients had gastric mucosa (predominant in 9); 25 patients had small bowel mucosa (4 mixed with gastric mucosa); 5 had predominantly large bowel mucosa; and 1 had ectopic pancreas.

The differential diagnosis of umbilical polyp includes umbilical granuloma, which is darker red, more apt to bleed, and responsive to silver nitrate cauterization, and also vascular neoplasms, including sarcomas and congenital hemangiomas (Table). It also includes a patent urachus, whose presence is confirmed by the passage of urine through the umbilicus.⁸ An inadvertently ligated loop of bowel that has herniated into the umbilical cord also may simulate a patent omphalomesenteric fistula, especially when there is an intestinal fistula.⁸

Conclusion

An omphalomesenteric remnant should be considered in any patient who has a persistent neonatal umbilical lesion. Early diagnosis of this lesion can facilitate treatment and lessen the risk from associated congenital anomalies of the primitive vitelline connection.

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