Contemplating the navel: Omphalomesenteric duct remnant disorders

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The umbilicus is the site of multiple of disorders of concern to dermatologists, including congenital and acquired malformations, genodermatoses (leukocyte adhesion deficiency), primary dermatoses, immunobullous disorders, infectious diseases, tumors (benign, malignant, or metastatic), omphaliths, or retained foreign bodies.[1]

Comprehending umbilical malformations mandates understanding umbilical embryology. At 3 weeks' gestation, the embryo is connected to the chorion by a connective stalk, containing the developing umbilical vessels and allantois. The primitive gut develops from the yolk sac and is connected, along with vitelline vessels, to the extracoelomic part via the vitelline duct (omphalomesenteric duct [OMD]). By the ninth week of gestation, the vitelline duct involutes, whereas the allantois obliterates by the fifth month into the urachus, a fibrous structure that connects the urinary bladder to the umbilicus, to leave behind the umbilical cord.[2]

A failure of the OMD to disappear may lead several defects, depending on the remnant site:

- Meckel's diverticulum (MD) arises from the ileum, caused by failed obliteration of the proximal portion of the OMD. MD occurs in approximately 2% of the population. Inflammation may be misdiagnosed as appendicitis.
- Vitelline fistula that communicates from the ileum to the umbilicus, clinically manifested by the discharge of fecal contents at the umbilicus.
- Vitelline sinus that opens at the umbilicus, caused by failed obliteration of the distal OMD, which may lead to umbilical discharge of mucus.
- Vitelline cysts caused by failed obliteration of the middle portion of the OMD, potentially leading to infection and purulent umbilical discharge.

Abbreviations used:

MD: Meckel's diverticulum
OMD: omphalomesenteric duct

- Vitelline bands connecting the intestine with the umbilicus, due to OMD persistence as a fibrous band, risking intestinal volvulus, obstruction, and strangulation.[3]

Of these defects, MD is the most common. Rare cases of OMD remnant adenocarcinomas have been reported.[4]

In this issue of the *Journal of the American Academy of Dermatology*, Cohen et al provide a systematic review of the literature evaluating OMD anomalies presenting with cutaneous symptoms, with attention to an index case of an 11-month-old boy. This patient presented with a pink nodule believed to be a pyogenic granuloma but showed features of an OMD remnant on biopsy. The authors reviewed 536 cases, and 97% of the patients were infants (mean age, 11 months). In 7.5% of cases, the diagnosis was established only after treatment failure (usually surgical excision). In 6.4%, nonlethal complications (such as intussusception or volvulus) were reported, and in 10.3% the outcome was death (due to sepsis, peritonitis, intestinal obstruction), partly related to delayed diagnosis or mismanagement. Deaths have been rare in the 21st century because of modern imaging. Importantly, the authors are not implying that every benign-appearing umbilical lesion, such as pyogenic granulomas or umbilical granulomas, should be imaged. They appropriately warn that red flags such as abnormal umbilical discharge, signs of peritonitis, or fever

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should lead to further investigation and/or surgical consultations.[5]

In conclusion, dermatologists confronted with umbilical lesions should carefully contemplate their patient's navel, considering whether OMD remnant pathology is a possibility.

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