Inguinal herniation of vitelline duct remnant
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A B S T R A C T
Meckel’s diverticulum and vitelline duct cysts result from incomplete obliteration of the vitelline or omphalomesenteric duct in utero. We report a case of an infant with a vitelline duct remnant within an inguinal hernia sac, incidentally encountered during inguinal herniorrhaphy and orchidopexy. The cystic remnant had a fibrous connection to the umbilical ring, suggesting an auto-amputated Meckel’s diverticulum with persistent residual cord to the umbilicus. This rare anomaly has the potential to cause serious complications by providing an intra-abdominal band with the risk for volvulus or internal herniation of small intestine.

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1. Case report

The patient was a 4 month old male, born at full term. His mother’s past medical history was significant for alcohol abuse. At birth, the child was noted to have several physical abnormalities, including club feet, lumbar scoliosis, as well as bilateral undescended testicles. At 4 months of age, he underwent scheduled orchidopexy and left inguinal hernia repair. Intraoperatively a cyst like structure resembling the vermiform appendix was found, contained in the inguinal hernia sac. After being incised, meconium was expressed. The structure was noted to be adherent to the internal lining of the hernia sac (Fig. 1). A thick fibrous stalk from its base leading to intra-abdominally was found. Transinguinal laparoscopy revealed a continuous connection of the cyst to the umbilicus. Subsequent transumbilical laparoscopy confirmed a free band connecting the umbilical ring with the cyst within the inguinal canal (Fig. 2). The leading diagnosis at the time was a herniated and incarcerated Meckel’s diverticulum, that had auto-amputated. No residual small bowel diverticulum was found on laparoscopic exploration. The cyst including cord to the umbilicus were excised and sent to pathology which showed intestinal mucosa, consistent with vitelline remnant or auto-amputated Meckel’s diverticulum.

2. Discussion

In this report, we present a case of a vitelline duct remnant within an inguinal hernia sac. We suspect an intrauterine auto-
amputation of a Meckels' diverticulum or vitelline duct cyst in this infant male, found incidentally during an orchidopexy and inguinal hernia repair. Vitelline duct remnants present in a broad variety; from obliterated bands to complete sinus tracts between small bowel and umbilicus with or without continuous connection between the intestine and the umbilical ring. Diagnostic laparoscopy did not reveal a residual outpouching of the small intestine, suggesting a complete detachment of a vitelline duct remnant at its intestinal base with residual obliterated cord to the umbilicus.

We speculate that the vitelline duct remnant either became strangulated within the processus vaginalis in utero, leading to hypoperfusion at its base with subsequent detachment, or spontaneously detached from its intestinal origin followed by herniation through the open processus vaginalis. Though this infant was asymptomatic at presentation, there are several potential complications of vitelline duct remnants (Table 1). The most concerning finding in this case was the fibrous band connecting the remnant with the umbilicus crossing the peritoneal cavity similar to a violin string, posing a risk for volvulus.

To our knowledge, there is only one previously reported case of auto-amputation of a Meckel's diverticulum [4]. However, our case differs in terms of time course, presentation, and anatomy of this phenomenon. The previously reported patient was a 52 year old male who presented with a bowel obstruction by a diverticulum attached to the abdominal wall via an adhesion that developed subsequent to abdominal surgery several years prior. In contrast, our patient was an asymptomatic infant with a congenital diverticulum attached to the umbilicus.

The processus vaginalis is an outpouching of the peritoneum that follows the intra-abdominal descent of the testes through the internal inguinal ring. Once the testes reach the scrotum, the processus vaginalis obliterates above the testicle, and persists below as the tunica vaginalis. In the majority of full term neonates, the processus vaginalis is closed at birth. Failure of this process can result in an indirect inguinal hernia. Testicular descent and closure of the processus vaginalis are likely linked biochemically and anatomically; undescended testicles are often accompanied by patency of the processus vaginalis [5,6]. One possible explanation for the phenomenon observed in this patient is that in utero incarceration of the vitelline duct remnant prevented closure of the processus vaginalis and testicular descent.

The reported prevalence of Meckel's diverticulum is 1.2–2% [7,8]. Patients are typically asymptomatic and the reported mortality rate is less than 0.01% [8]. Because Meckel's diverticulum is rare and has a low morbidity, routine screening is not justified. Furthermore, Meckel's diverticulum is not easily detected. Since Meckel's diverticula often contain heterotopic gastric mucosa, they may be detected using scintigraphy with technetium-99m per-technetate, which accumulates in mucoid epithelial cells. However, the sensitivity of this imaging modality is moderate and dependent on the amount of heterotopic tissue causing symptoms, such as bleeding [9,10]. Given the asymptomatic presentation we think that there was no indication for preoperative scanning or imaging this infant.

3. Conclusion

In this report, we present the unique case of an inguinal herniation of an isolated vitelline duct remnant with fibrous connection to the umbilical ring, but no association to the intestinal tract. The patient was asymptomatic and the remnant an incidental finding. The intra-abdominal cord was excised along with the remnant to prevent serious complications like volvulus or intestinal hernias.

Conflicts of interest

None.

References


