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Successful Management of the Omphalomesenteric Fistula: About Three Case Reports

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Abstract **Case Report**

The omphalomesenteric duct is an embryologic connection between the midgut and yolk sac, which typically disappears at the 5th to 7th week of gestation. Failure of the obliteration process can lead to omphalomesenteric duct remnants. It usually has a difficult diagnosis, manifested by a variety of cutaneous signs, such as an umbilical mass, granulation tissue, or discharge. This article reports three cases of total persistence of the OMD and reviews the surgical management of those lesions. The first case reports a 6-day-old boy with a patent omphalomesenteric duct fistula opening to the umbilicus presenting with feces sprouting from the umbilical stump. The second one reports a one-month-old infant brought to the hospital with umbilical granuloma, with no response to topical treatment that later started draining feces from the umbilical cord. The third one reports a three-day-old male newborn that manifested a granuloma-like lesion on the umbilical scar with no improvement with topical treatment. A simple catheterization with a relation catheter was performed in all cases showing drainage of a bilious secretion. they were then diagnosed with a persistence of the Vitelline Duct. All infants had a similar surgical approach, with an abdominal elective incision made around the lesion on the abdominal wall. Identification of the fistula trajectory, followed by resection of the bowel segment that contains the fistulae and a formation of a terminal-terminal anastomosis.

Keywords: Omphalomesenteric Duct, Fistula, Newborn, Transumbilical Approach.

INTRODUCTION

Persistent vitellointestinal duct, also known as omphalomesenteric duct (OMD), is a rare congenital gut malformation affecting approximately 2% of the population, with complete patency occurring in less than 0.1% [1, 2]. It typically manifests within the first year of life, with a higher incidence among males [1-3]. Usually, the duct fully disappears at the 5th to 7th week of gestational age. However, if the duct fails to be closed at appropriate times, it results in several residual structures called OMD remnants [4]. Due to its rarity, diagnosing total OMD persistence can be challenging. Patients may present with various symptoms, including skin lesions, granulomas, masses, or discharge in the umbilical area, as well as abdominal symptoms like pain. Some patients may remain asymptomatic [1].

We report three cases of total persistence of the Vitelline Duct and aim to bring to mind this differential diagnosis and briefly review the surgical management of those lesions.

CASES PRESENTATIONS

Case 1: A six-day-old male, was born at term, which occurred without further complications, the baby was delivered by cesarean section. He was admitted to the neonatal intensive care unit because of respiratory distress syndrome and was referred to the pediatric surgical emergency department. A yellowish discharge, found to be digestive fluid was leaking from the opening in the umbilical stump, and an umbilical protrusion was noticed (Figure 1), an exploration of the umbilical scar by a catheterization relation catheter led to the drainage of feces from the catheter. The infant was then diagnosed with a persistence of the Vitelline Duct. Surgical correction of the vitello intestinal fistula was scheduled.

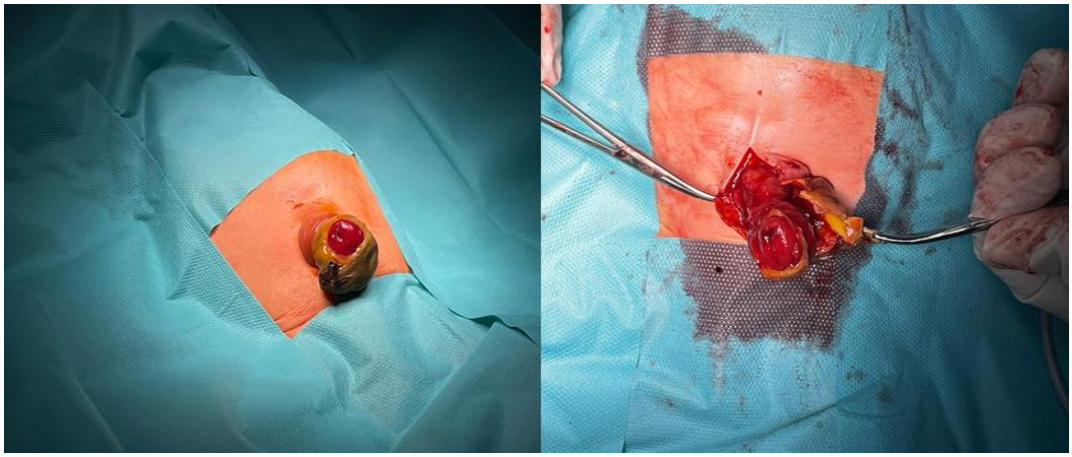

Figure 1: Pictures of the first patient showing clinical (left) and per-operative (right) aspects of the omphalomesenteric fistula

Case 2: An one-month-old infant, was born at term, which occurred without further complications. The patient was discharged home soon after its birth. Later, after perceiving a persistence of the umbilical cord at the end of the first month of life (Figure 2), the mother sought medical assistance. She reported that a silver nitrate-based cream was prescribed to the umbilical scar at the time, with no improvement of the lesion. She then perceived the drainage of feces from the umbilical scar and was referred to the pediatric surgical emergency department in its follow-up consultations. On ambulatory follow-up, the patient underwent an exploration of the umbilical scar by catheterization with a simple relation catheter that led to the drainage of feces from the catheter. The infant was then diagnosed with a persistence of the Vitelline Duct. Surgical correction of the vitello intestinal fistula was scheduled.

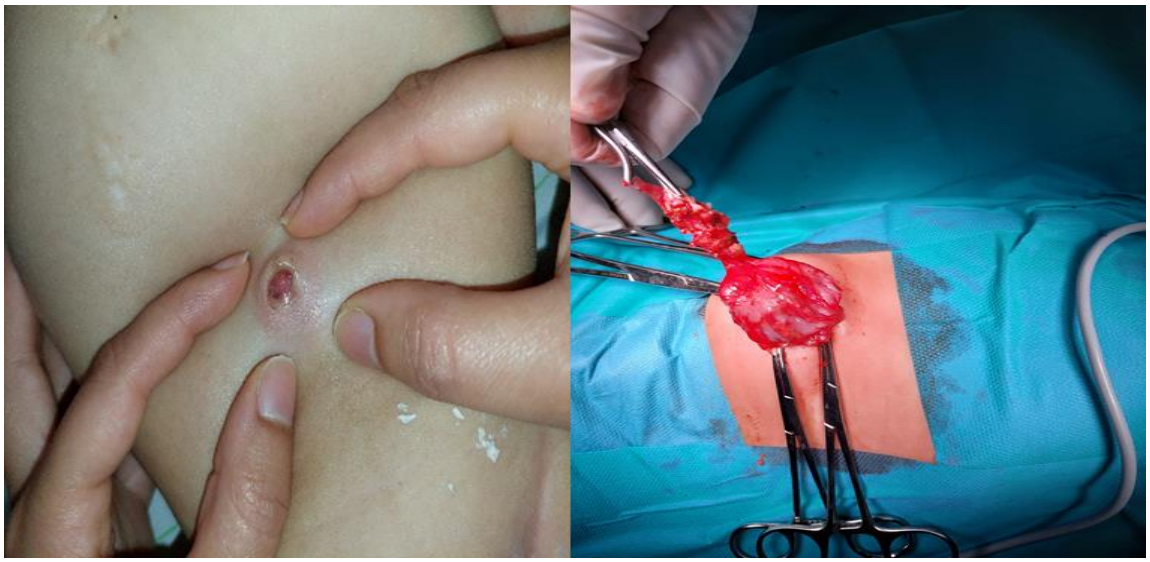

Figure 2: Pictures of the second patient showing clinical (left) and per-operative (right) aspects of the omphalomesenteric fistula

Case 3: A three-day girl, The baby was delivered by vaginal birth at the 38th week of gestation. On initial evaluation, the patient was diagnosed with an umbilical granuloma (Figure 3), and a topical treatment with 20% NaCl was indicated.

After 48 hours of the initial evaluation by the pediatric surgery team, a reevaluation was solicited, since the newborn had started to eliminate feces by the umbilical cord. A simple catheterization with a nelaton catheter was performed showing drainage of a bilious secretion. The infant was also diagnosed with a persistence of the Vitelline Duct. Surgical correction of the vitello intestinal fistula was scheduled.

In our work, all infants underwent a similar procedure. An elective abdominal incision was made around the lesion on the abdominal wall. The fistula trajectory was then identified followed by segmental resection and termino-terminal anastomosis with interrupted stitches was performed, the abdominal wall was then closed. After surgery, all patients were

discharged on the 6th post-operative day, Up to today, patients did not present any further complications related to the fistula.

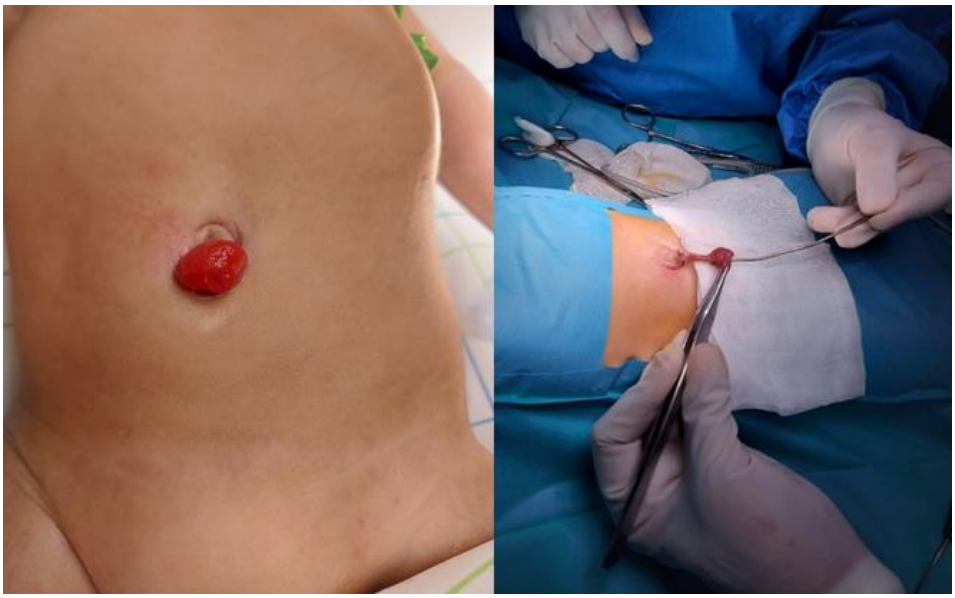

Figure 3: Pictures of the third patient showing clinical (left) and per-operative (right) aspects of the omphalomesenteric fistula

DISCUSSION

The omphalomesenteric duct (OMD) usually disappears completely during the 5th to 7th weeks of gestational age, and the failure to close is termed an OMD fistula or vitelline fistula [5]. Many umbilical abnormalities such as fistulas, sinus tracts, cysts, mucosal remnants, and congenital bands require surgical correction and are usually caused by OMD remnants [6]. When OMD is present from the ileum to the umbilicus, it results in the discharge of meconium from the umbilicus [6].

OMD abnormalities occur in about 2% of newborns, and 6% of the ducts remain patent. The exact etiology of incomplete obliteration is still unknown. In 1959, Soderlund [7] categorized these abnormalities into six sections, which are umbilical cyst, umbilical sinus with a band, umbilical polyp covered with intestinal mucosa, a fibrous band containing a cyst, Meckel's diverticulum, and patent OMD. Our reported cases are related to a complete patency malformation, two of the three infants were from the male sex, relating to the higher rates among boys. All cases were also diagnosed within the first months of life.

The malformation has variable clinical manifestations, presenting more often as an umbilical area abnormality, such as a mass, a polyp, or a discharge. Those lesions are differential diagnoses for other umbilical area disorders. Some patients might also show symptoms of an acute abdomen, such as abdominal pain, hematochezia, and obstructive symptoms [2, 8-10]. Two of our three patients were initially diagnosed as a case of umbilical granulomas and had topical treatments prescribed, having their diagnosis corrected later as the lesion started to present discharge. The same investigation process occurred with patients described in other case reports [1, 8, 9]. In our cases, clinical examination was sufficient with a simple catheterization with a relation catheter showing drainage of a bilious secretion. However, as is commonly used in abdominal disease imaging has an important role in diagnosing OMD persistence and for surgical preparation, especially contrasting techniques [3, 8]. A review of the literature shows that both ultrasonography and fistulography were used as effective diagnostic tools for OMD fistula and other related remnants of the OMD [11-13].

The surgical procedure usually involves a circular incision around the umbilical scar giving access to the OMD remnants, proceeding with the remnants resection through the abdominal, reaching the bowel section connected to the fistula. After complete resection of the OMD bowel reconstruction is performed. Both procedures were performed in all cases without complications, with all patients being discharged showing no further complications after surgery.

CONCLUSION

The omphalo-mesenteric fistula is rare. The diagnosis relies on clinical evaluation supplemented by ultrasonography and fistulography. Surgical treatment via an elective peri-umbilical approach has shown favorable outcomes.

Conflict of Interest: All the authors declare that they do not have any conflict of interest.

Consent of Publication: Consent from parents has been taken.

Author's Contribution: All the authors have contributed to the redaction of this manuscript.

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