

## Coexistence of Multiple Omphalomesenteric Duct Anomalies

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### ABSTRACT

The omphalomesenteric duct is an embryonic structure which connects the yolk sac to the midgut. The omphalomesenteric duct attenuates between the 5<sup>th</sup> and 9<sup>th</sup> week of gestation. Failure of the omphalomesenteric duct involution, either partial or complete, results in various omphalomesenteric duct remnants including Meckel's diverticulum, patent vitelline duct, fibrous band, sinus tract, umbilical polyp and cyst. Omphalomesenteric duct remnants are present in 2% of the population but related diseases have seldom been reported in adults. The simultaneous presence of sinus tract, omphalomesenteric cyst, fibrous ligament and Meckel's diverticulum has, according to authors' knowledge, never been reported. We present a case of a 23 years old male with persisting umbilical discharge for 2 years in whom there was coexistence of the above mentioned anomalies of the omphalomesenteric duct.

**Key words:** Vitelline duct. Meckel's diverticulum. Omphalomesenteric cyst. Sinus tract. Fibrous band.

### INTRODUCTION

The presence of umbilical discharge in adults is quite rare but when persistent, it can become very irritating for the patient.<sup>1</sup> It is a symptom of varied pathology, owing both to congenital diseases and acquired conditions, which represent the most common cause of umbilical discharge.<sup>1,2</sup> Embryonic anomalies of the omphalomesenteric duct can also be the cause of umbilical discharge.<sup>1-4</sup> Omphalomesenteric duct remnants include Meckel's diverticulum, patent vitelline duct, fibrous band, sinus tract, umbilical polyp (mucosal remnant) and cyst.<sup>5</sup> Diseases related to omphalomesenteric duct remnants have seldom been reported in adults.<sup>6-8</sup> The simultaneous presence of sinus tract, omphalomesenteric cyst, fibrous ligament and Meckel's diverticulum has, according to authors' knowledge, never been reported.

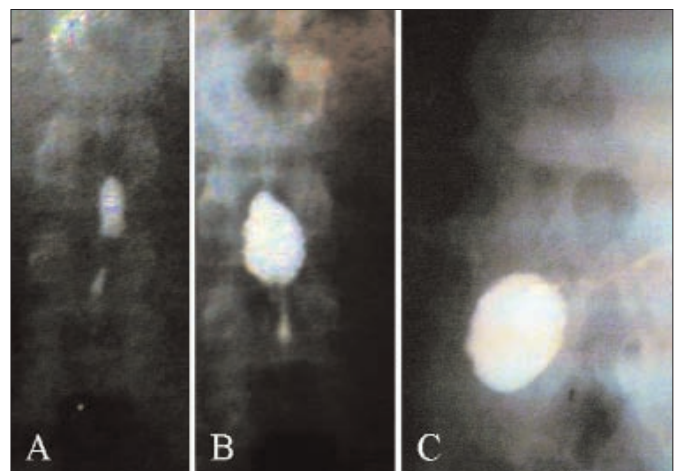
We present a case of a 23 years old male with persistent umbilical discharge for 2 years in whom there was coexistence of the previously mentioned anomalies of the omphalomesenteric duct.

### CASE REPORT

A 23 years old man presented with complains of chronic umbilical discharge. The symptoms were present for about 2 years and despite various treatments including local and systematic antibiotic therapy and non-steroid

anti-inflammatory drugs there was no clinical improvement. Clinical examination revealed inflammation of the umbilical area and purulent discharge of the umbilicus from a sinus tract. Laboratory investigations were within the normal limits, while the cytological exam of the discharge revealed the presence of leukocytes and the cultures were negative.

A fistulogram was performed which demonstrated the sinus tract and the presence of an umbilical cyst (Figure 1). Surgical intervention was decided. Methylene blue was injected through the sinus tract in order to paint both the tract and the cyst. Through a semicircular infraumbilical incision the sinus tract was followed up to the junction with the omphalomesenteric cyst which extended into the peritoneal cavity where the cyst's posterior wall was attached to a fibrous band leading to Meckel's diverticulum, without any pathological lesions (Figure 2). The sinus tract, the cyst and the fibrous band



**Figure 1:** A fistulogram demonstrating the sinus tract (A) and the omphalomesenteric cyst (B) which appears to extend through the abdominal wall to the peritoneal cavity (C). (A, B: face, C: profile).

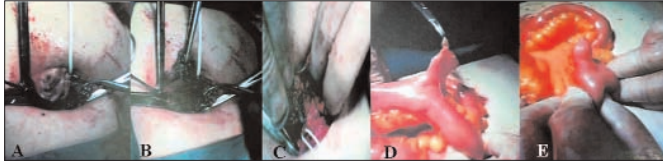
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**Figure 2** Through a semicircular infraumbilical incision (A), the sinus tract was prepared (setons) leading to the omphalomesenteric cyst (B). The posterior wall of the omphalomesenteric cyst was attached to a fibrous band (setons) (C). This band (forceps) (D) extended to the Meckel's Diverticulum (D,E) connecting the cyst to the diverticulum. Distinct blood supply of the Meckel's diverticulum was also observed (D).

were resected while the Meckel's diverticulum was excised using a transverse wedge incision. Histopathologic examination showed the presence of intestinal mucosa both to the omphalomesenteric cyst and the Meckel's diverticulum.

The patient's postoperative course was uneventful and the patient was discharged on the 8<sup>th</sup> postoperative day.

## DISCUSSION

The omphalomesenteric duct, also called vitelline duct, is an embryonic structure which connects the primitive yolk sac to the primitive midgut, through the umbilical coelome, and contains the omphalomesenteric vessels which provide nutrition to the early developing embryo until the placenta is established.<sup>6-8</sup> The omphalomesenteric duct gradually attenuates as the placental circulation is increasing and atrophies, separates from the intestine and finally disappears between the 5<sup>th</sup> and 9<sup>th</sup> week of gestation.<sup>3,7-9</sup> Failure of the omphalomesenteric duct involution, either partial or complete, results in various residual anatomical entities.<sup>3,7-9</sup>

Omphalomesenteric duct remnants are present in 2% of the population.<sup>9</sup> Meckel's diverticulum is the most common presentation of an omphalomesenteric duct remnant and is generated when the proximal duct persists.<sup>1-9</sup> In cases the entire duct remains patent, an omphalomesenteric fistula is formed between the umbilicus and the ileum, while a persistent lesion of the distal duct forms a sinus tract and the patency of the intermediate duct with closure at both ends leaves an omphalomesenteric cyst.<sup>7</sup> Finally, a fibrous ligament may be present with no open fistulas connecting the umbilicus to the intestine.<sup>7</sup> In the present case, the entire omphalomesenteric duct has remained, but instead of forming a patent fistula, it presented with a sinus tract communicating with an omphalomesenteric cyst, which was connected by a fibrous band to a Meckel's diverticulum, a coexistence of multiple omphalomesenteric remnants that has, according to authors' knowledge, never been reported.

Under considering the observation that a patent omphalomesenteric fistula may spontaneously regress and form a Meckel's diverticulum,<sup>9</sup> it is possible that in

the present case a patent omphalomesenteric fistula has only partially regressed and resulted in this variety of lesions. However, the patient history was not clear about the presence of umbilical discharge during infancy. Another interesting point of the present case is that the omphalomesenteric cyst drained through the sinus tract to the umbilicus, which also according to our knowledge has never been reported, as omphalomesenteric cysts are closed at both ends. In this case, the cyst may have been open at all times, but it is also possible, taking into account the fact that the patient's umbilical discharge was reported for only the last two years, that the cyst was closed and the communication with the sinus tract was formed when the discharge began. In addition, the possibility that the sinus tract was not present at first and was formed afterwards cannot be excluded.

Clinical presentation of omphalomesenteric remnants includes abdominal pain, intestinal obstruction, rectal bleeding, umbilical hernia and umbilical discharge and the symptoms are age dependent and usually occur before the age of four, while adult patients are usually asymptomatic.<sup>3,4,9</sup> Ultrasound, CT scan, Meckel's scan and fistulograms are helpful in determining the cause of the symptoms, when the presence of omphalomesenteric duct remnants is suspected.<sup>10</sup> Moreover, a differential diagnosis from urachal remnants should be made.<sup>4,6</sup> The treatment of symptomatic lesions is surgical either by conventional or laparoscopic surgery, while in asymptomatic subjects surgery is not necessary.<sup>3,4,6,8</sup>

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