AN UNCOMMON LOCATION OF MECKEL’S DIVERTICULUM OR SMALL INTESTINE DUPLICATION? CASE REPORT AND LITERATURE REVIEW

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Meckel’s diverticulum is the most common congenital abnormality of alimentary tract. The antimesenteric location is one of the cardinal attributes of this pathology. We report case which tries to verify this dogma. The literature regarding uncommon location of Meckel's diverticulum was also reviewed.

Key words: Meckel’s diverticulum, enteric cysts, duplications of the alimentary tract

In 1598, Fabricius Hildamus mentioned and documented for the first time ever an abnormality which is known nowadays as Meckel’s diverticulum. However, Johann Friedrich Meckel, the Younger German anatomist and surgeon, explained in 1809 its actual embryological origin (1). It is well known that it is a remnant of the omphalomesenteric duct connecting the yolk sac to the intestinal tract during fetal life. It usually obliterates during the time period between the 5th and the 7th week of gestation. If obliteration fails, different clinical malformations will manifest, with Meckel's diverticulum constituting more than 95% of these anomalies.

For the description of Meckel’s diverticulum a very useful mnemonic is used, commonly know as “the rule of twos”. This states that with a prevalence of approximately 2% and with 2:1 male-to-female predominance, it is located two feet proximal of the ileoceacal valve in adults and measures two inches in length; half of the symptomatic patients are younger than 2 years of age.

Approximately 60% of Meckel’s diverticula contain ectopic mucosa, most commonly gastric mucosa (2, 3). Jay and co-workers developed restrictive criteria defining this abnormality and dictating that the diverticulum must arise from the antimesenteric border of the gut proximal to the ileoceacal valve, contain all five layers of the small intestine, and have a separate blood supply, in the form of the vitelline artery or its remnant, as a mesodiverticular band (4).

Alimentary tract duplication is a less common pathology. It is observed in 1 of every 4500 autopsies. The small intestine is the most frequent site involved, accounting for 44% of all cases (5). The etiology is not known. Several theories have been postulated which tried to define possible embryogenetical disorders; however, none of them gains common approval (6). Characteristic attributes for both abnormalities are presented in tab. 1.

CASE REPORT

A 25-year old man was admitted to our ward due to a hypogastric cyst, incidentally discovered during ultrasonograpic examination. He denied any health discomforts at the moment of admittance. The patient declared periodic abdominal pain, occurring approximately once in every six months. The patient’s past medical history included hospitalization at the Depart-
ment of Pediatric Surgery, because of bellyache at the age of 16, where acute diseases requiring operative procedures had been excluded.

Laboratory studies were all within normal limits. Computer tomography exposed a cystic lesion, with 10x6 cm in its largest dimension (fig. 1). The lesion was punctuated by the guidance of US (fig. 2). Outflow of chocolate-like, odorless matter was observed. Microbiological (bacterial cultures – negative) and cytological (no atypical cells) examination of the obtained fluid was performed. The catheter was left, allowing for further drainage. Radiographic assessment did not reveal a communication with the intestinal lumen or the urinary bladder.

For the following three days, discharge from the catheter was observed and documented; the liquid changed colour as time passed by. At first, brown-coloured liquid similar to the primary punctate was flowing out from the catheter, slowly changing character to a slightly cloudy, straw-coloured liquid. Samples were collected and sent to biochemical examination (result: low cytosis and exudative characteristics of the fluid). Due to the ineffectiveness of percutaneous drainage the patient was qualified for surgical treatment.

Intraoperatively a mesenteric cyst, adherent to the ileum, and with localisation about 60 cm from the ileocecal valve, was detected (fig. 3). Moreover, it became clear that the drain introduced preoperatively under US guidance, had been placed outside of the lumen of the lesion (and thus explaining the above mentioned change in fluid characteristics). Part of small intestine including the cyst was then excised and an end-to-end anastomosis was performed.

Histopathological examination revealed ectopic gastric mucosa with chronic active inflammation. Glandular epithelium presented foci of low grade dysplasia. Furthermore, a focus of fibrous granulation below the lesion was detected. Mesenterical changes demonstrated attributes of blood effusion removal and organization, which might had been a result of bleeding from the ectopic gastric mucosa.

Table 1. Characteristic attributes for Meckel’s diverticulum and small intestine duplication

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Meckel’s diverticulum</th>
<th>Small intestine duplication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimesenteric location</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Wall containing five layers</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Ectopic mucose</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Separate blood supply</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Distance from ileocecal valve</td>
<td>2 feet</td>
<td>various</td>
</tr>
<tr>
<td>Communication with intestine lumen</td>
<td>yes</td>
<td>variously, communication in case of cystic duplication is unusual</td>
</tr>
</tbody>
</table>

Fig. 1. Computer topography: hypogastrial cyst

Fig. 2. US-guided percutaneous drainage
DISCUSSION

As mentioned above, the antimesenteric location is one of the cardinal attributes of Meckel's diverticulum. Hitherto several reports have been published trying to verify this dogma. An interesting observation was made by Kurzbart and associates. They performed abdominal radiography through a fourth lumen found in the transected umbilical cord of an infant. The small bowel was filled with contrast material which unambiguously proved the presence of a patent omphalomesenteric canal. When the child was 3 months old, the umbilical skin was completely healed; however, a small umbilical hernia had been left. During the performed operation neither the vitelline duct nor its fibrous remnant was present. This spontaneous regression of a patent omphalomesenteric duct is an immensely rare observation. Furthermore, a mesenterical-localized Meckel's diverticulum was detected intraoperatively (7).

In tab. 2 we confront two other cases of the alleged Meckel’s diverticulum in uncommon mesenteric location, with a patient operated in our ward. Attributes which do not suit well-known definition of this abnormality were bolded. It is worth mentioning that although both authors favour the diagnosis of Meckel's diverticulum, they cannot rule out the possibility of ileal duplication. Sarioglu-Buke and associates cite the Kusumoto paper construing the absence of a separate blood supply. The Japanese analyzed 776 patients, which had been operated because of Meckel's diverticulum and revealed that the vitelline artery was present in about 10% of all cases (10). Therefore, this is not a sufficient criterion for a differential diagnosis.

Segal explained the lack of communication with the lumen of the adjacent bowel as a result of an inflammatory process which might have caused obliteration. A similar situation might have taken place in the case of our patient, where chronic inflammation and fibrous granulation were detected in the histopathological examination between diverticulum and intestine. It is worth taking into consideration how these authors are trying to explain the genesis of such a variant of presented anomaly. It could be due to a short vitelline artery that disappeared without leaving a remnant or to an adhesion between the mesentery of the ileum and the omphalomesenteric duct. Thus, during the elongation and growing process, the “stuck” diverticulum might have been diverted from the antimesenteric border of the ileum.

SUMMARY

It is difficult to verify unambiguously which of the presented abnormalities we had to deal with. In our opinion both anomalies like
Meckel’s diverticulum and intestinal duplication are possible and the differential diagnosis between them might be dubious in this unusual case. The goal of this paper is to remind of the possibility of a small intestine duplication, which is a rare and often forgotten entity in the practice of the general surgeon. Moreover, according to single articles about the uncommon mesenteric localisation of Meckel’s diverticulum, its classification needs reviewing.

REFERENCES


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