Bratisl Lek Listy 2009; 110 (11)
736 – 737

MORPHOLOGICAL STUDY

Abnormal peritoneal fold connecting the greater omentum with the liver, gallbladder, right kidney and lesser omentum

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Abstract: Abnormal peritoneal folds near the liver are very rare. This case report presents an observation of an abnormal fold of peritoneum that extended from the upper right part of the greater omentum and stomach to the fossa for gallbladder. This fold merged with the lesser omentum on the left and extended to the right kidney when traced posteriorly. The epiploic foramen was entirely absent due to the presence of this fold. However, the lesser sac was there behind the liver, lesser omentum and stomach. The knowledge of abnormal folds like this may be important for surgeons *(Fig. 3, Ref. 7)*. Full Text (Free, PDF) *www.bmj.sk.*
Key words: peritoneum, peritoneal fold, greater omentum, lesser omentum, liver, gallbladder.

The peritoneum is the largest and most complexly arranged serous membrane in the human body. It forms several folds which are called ligaments, mesenteries and omenta. These folds suspend and support the viscera, carry blood vessels to them and help in their movements. The peritoneal ligaments, mesenteries and omenta also serve as boundaries for some special regions of peritoneal cavity and they determine the direction of the flow of fluids in the peritoneal cavity. The process of formation of the periotoneal folds around the liver and the stomach is complicated and it is completed in the intra-uterine period. During the embryonic life, the stomach starts its development as a fusiform dilatation of the foregut just distal to the esophagus. Its posterior border is attached to the posterior abdominal wall by a fold of peritoneum called dorsal mesogastrium and anterior border is attached to the anterior abdominal wall by ventral mesogastrium. The liver develops in the ventral mesogastrium and divides it into falciform ligament and lesser omentum. The spleen develops in the dorsal mesogastrium and eventually the dorsal mesogastrium gets divided into gastrophrenic, gastrosplenic and splenorenal ligaments. Abnormalities in the formation of these folds of peritoneum in relation to liver and stomach are very rare. This case report presents an observation of an abnormal fold of peritoneum between greater omentum, stomach and liver.

Case report

During regular dissections for undergraduate medical students at Melaka Manipal Medical College (Manipal Campus) an abnormal peritoneal fold in a formalin embalmed male cadaver aged approximately 60 years was detected. The fold extended from the upper right part of the greater omentum and the pyloric end of the stomach and first part of the duodenum to the right lobe of the liver (Figs 1, 2 and 3). The fold, traced to the left, became continuous with the lesser omentum (Fig. 3); traced to the liver, totally covered the gall bladder (Fig. 2) and traced behind, it merged with the front of the right kidney, thus blocking the epiploic foramen (Fig. 2). The gall bladder was a bit smaller than its normal size and its walls were thickened. There was a space (lesser sac) behind the left lobe of the liver, lesser omentum and stomach. However, it did not communicate with the greater sac.

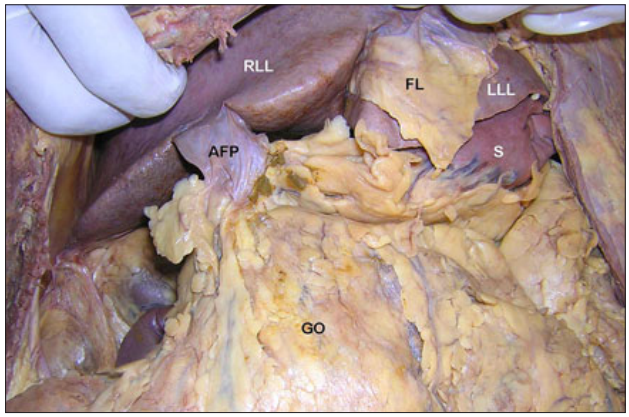

Fig. 1. Dissection of the upper abdomen showing the abnormal fold of peritoneum. RLL – right lobe of liver, LLL – left lobe of the liver, FL – falciform ligament, AFP – abnormal fold of peritoneum, S – stomach, GO – greater omentum.

Discussion

The abnormal folds of the peritoneum may be attributed to the abnormal rotations of the viscera or abnormal fusions of the me-

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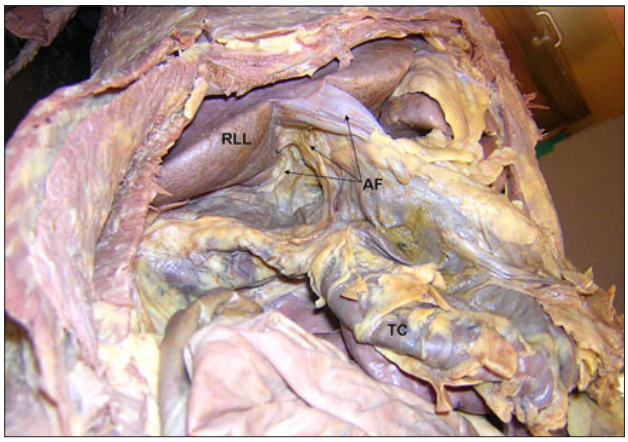

Fig. 2. The right lateral view of the upper abdomen showing the right side of the abnormal fold of peritoneum. RLL – right lobe of liver, AF – abnormal fold of peritoneum, TC – transverse colon.

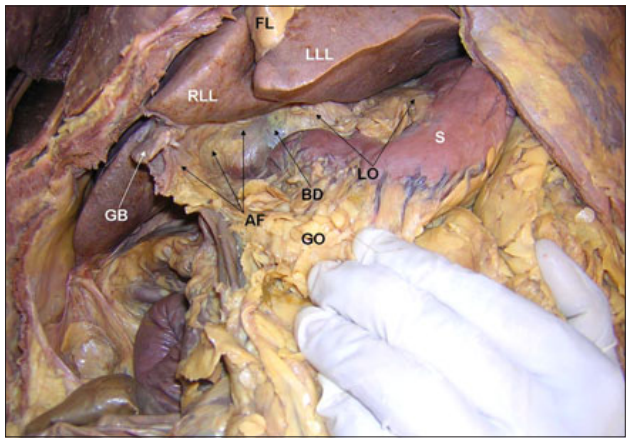

Fig. 3. The left lateral view of the upper abdomen showing the continuity fold of peritoneum with the lesser omentum. RLL – right lobe of liver, LLL – left lobe of the liver, FL – falciform ligament, AF – abnormal fold of peritoneum, LO – lesser omentum, BD – Greenish discoloration of lesser omentum over the bile duct, S – stomach, GO – greater omentum, GB – gallbladder.

senteries with the organs or the posterior abdominal wall. During the development of the gastrointestinal tract, two mesenteries, namely dorsal and ventral hold the gastrointestinal tract against anterior and posterior abdominal walls. The ventral mesentery develops only in the region of the terminal part of the esophagus, the stomach, and upper part of the duodenum and it develops from the septum transversum. The movement and growth of the liver into the mesenchyme of the septum transversum divides the ventral mesentery into (i) the lesser omentum, extending from the stomach, and the upper part of the duodenum to the liver, and (ii) the falciform ligament, extending from the liver to the anterior abdominal wall (1). The rest of the ventral mesentery disappears.

An abnormal fold that caused a constriction on the wall of duodenum has been reported by Low et al (2) and this fold was notable radiologically. A case of obstruction of the proximal part of the jejunum by a congenital band has also been reported (3). An attachment of the greater omentum with the falciform ligament in a cadaver has been recorded (4). The gall bladder may also have peritoneal folds attached to it. A floating gall bladder with a mesentery is an example for this (5). There are reports of floating gallbladder forming volvulus (6). An abnormal cystogastrocolic fold has been reported by pamidi N et al (7) Anomalous folds of peritoneum have been reported in the past but no reports are available on fold connecting greater omentum, stomach, gall bladder, lesser omentum and right kidney.

In the presented case, the fold extended to the fossa for gallbladder from the upper right part of the greater omentum. The fold merged on the left side with the lesser omentum and behind with the right kidney. The probable reason for this fold is an embryonic adhesion between the dorsal and ventral mesogastria during the rotation of the stomach. Rotation of the stomach to the right on its longitudinal axis results in the formation of lesser sac and epiploic foramen. Probably towards the end of this rotation, the ventral and dorsal mesogastria would have fused on their right ends. Closure of epiploic foramen by peritoneal bands may be dangerous. It might result in accumulation of the peritoneal fluid in the lesser sac in inflammatory conditions. The fold that was observed in this case might restrict the expansion of the gallbladder during its filling process. Though there was no marked reduction in the size of gallbladder in our case, the walls of the gallbladder were thicker than normal. This could be due to the resistance offered by the peritoneal fold during the distension of the gallbladder.

The knowledge of abnormal peritoneal folds such as the one which is reported here is important for surgeons dealing with the surgeries of liver, gallbladder, stomach and kidney. These folds may also cause difficulties in radiological diagnosis.

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Received March 23, 2009.
Accepted August 18, 2009.