Case Report:
Multiple Visceral and Peritoneal Anomalies

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Abstract: Visceral and peritoneal anomalies are frequently encountered during cadaveric dissections and surgical procedures of abdomen. A thorough knowledge of the same is required for the success of diagnostic, surgical and radiological procedures of abdomen. We report multiple peritoneal and visceral anomalies noted during dissection classes for medical undergraduates. The anomalies were found in an adult male cadaver aged approximately 70 years. The right iliac fossa was empty due to the sub-hepatic position of caecum and appendix. The sigmoid colon formed an inverted “U” shaped loop above the sacral promontory in the median position. It entered the pelvis from right side, close to the right wall of the true pelvis. The sigmoid mesocolon was attached obliquely to the posterior abdominal wall, just above the sacral promontory. Further there was a cysto-colic fold of peritoneum extending from the right colic flexure. We discuss the clinical significance of the variations.

Key Words: Peritoneum; cysto-colic fold; sigmoid colon; sigmoid mesocolon; caecum.

Introduction:
Peritoneum is a serous membrane that lines the abdominal cavity. It protects the abdominal organs from infections, helps in smooth movements of the intestine by lubricating it, stores fat and allows blood vessels to reach the organs through various peritoneal folds. Many organs in the abdomen are connected to each other or to the walls of abdomen through various folds of peritoneum. These folds, apart from carrying the blood vessels and nerves, provide support to the viscera. These folds develop during embryonic development and some erroneous rotation of the gut or abnormal movements of viscera during embryonic development might result in presence of either abnormal folds or abnormal positions of normal folds of peritoneum. Sigmoid colon is normally suspended in the pelvic cavity by the sigmoid mesocolon. There are reports on some of the abnormal positions and lengths of sigmoid colon and its mesocolon.(1, 2) Usually, gallbladder is situated in the gallbladder fossa of liver. Neither it has a mesentery, nor is it attached to any other organs by peritoneal folds. However occasionally there exist some abnormal folds of peritoneum attaching it to the nearby visera such as right colic flexure and stomach.(3,4) The caecum and appendix occupy the right iliac fossa. But due to failure to descend during development, in rare cases, they stay close to liver and the condition is called sub-hepatic caecum and appendix. There are reports in the literature about the subhepatic caecum also.(5-7) We present a combined variation of peritoneum and caecum in this case report and discuss its clinical implication.

Case Report:
During routine dissection classes, we observed multiple visceral and peritoneal anomalies in the abdomen of a male cadaver aged approximately 70 years. The cecum was in subhepatic position. The right iliac fossa was empty. The sigmoid colon made an inverted “U” shaped loop above the sacral promontory in the median position. It entered the pelvis from right side, close to the right wall of the true pelvis. The sigmoid mesocolon was short and fan shaped. It was attached obliquely to the posterior abdominal wall, just above the sacral promontory. Since major part of the sigmoid colon was in the abdomen proper, the pelvic cavity was roomy. Further, there was a cysto-colic peritoneal fold that extended from the right colic flexure to the gall bladder.
covered the gall bladder completely. These variations are shown in Figures 1-3.

Figure 1. Photograph of lower part of abdominal cavity showing inverted “U” shaped sigmoid colon.
(SC – sigmoid colon; SMC – sigmoid mesocolon; EIV – external iliac vessels; AAW – anterior abdominal wall; CEC – cecum; ME – mesentry of small intestine)

Figure 2. Photograph of lower part of abdominal cavity showing displaced cecum and sigmoid colon. Note that the sigmoid colon has been reflected downwards.
(SC – sigmoid colon; SMC – sigmoid mesocolon; EIV – external iliac vessels; AAW – anterior abdominal wall; CEC – cecum; ME – mesentry of small intestine; RIF – right iliac fossa; VE – vermiform appendix)

Figure 3. Photograph of upper abdominal viscera, as seen after reflection of anterior abdominal wall.
(RLL – right lobe of liver; LLL – left lobe of liver; CCF – cystocolic fold of peritoneum; AC – ascending colon; TC – transverse colon; GO – greater omentum)

Discussion
Though variations of peritoneum are common, variations of sigmoid colon and its mesocolon are rare. These variations when present, can result in volvulus formation and pose difficulties in colonoscopy.(8) In the current case, sigmoid colon made an inverted “U” shaped loop in the midline above the sacral promontory and the sigmoid mesocolon was attached obliquely just above the sacral promontory. Earlier, Nayak et al., (2) have reported an inverted “U” shaped sigmoid colon. But in that case, the loop was situated in front of the left kidney in paramedian plane. The sigmoid colon and mesocolon were abnormally long. In the current case the sigmoid colon entered the pelvic cavity along its lateral wall. A similar incident has been reported where sigmoid colon descended along the right wall of the pelvis by Indrajit et al., (9) but in their case, the descending colon was situated on the right side of the vertebral column and made a second hepatic flexure of the colon. The caecum and appendix in the current case were close to the liver and therefore right iliac fossa was empty. There are previous reports on such an anomaly and when there is appendicitis in such a position of appendix, can make the diagnosis and laparoscopic surgery challenging.(6,7)

It is not uncommon to find peritoneal folds attached to the gallbladder. They may extend from greater omentum, right colic flexure, or stomach to gallbladder.(3,4,10) They may partially or completely enclose the gallbladder in them. Such folds may be generally harmless but in some cases they may compress the gallbladder and obstruct the biliary fold. They may also cause difficulties in laparoscopic cholecystectomy. During embryonic development, the midgut forms a loop which herniates into the umbilical cord due to the lack of space in the abdominal cavity. This happens in the 6th week of gestation. Around the 10th week the intestine returns to the abdomen. Immediately after the return of the intestine back to the abdomen, the caecum is situated close to the liver. Later it descends to the right iliac fossa. The gut loses parts of its mesenteries such as ascending and descending mesocolons. Remaining folds such as sigmoid mesocolon, transverse mesocolon and mesoappendix persist.(11) The possible embryonic reason for the right sided sigmoid colon; the high level attachment of sigmoid mesocolon and the subhepatic position of caecum could be a little earlier fixation of the colon to the abdominal wall after the reduction of physiological umbilical hernia. This would have caused the arrest of the caecum in sub-hepatic position.

Conclusion:
Though there are reports on individual variations like displaced sigmoid colon, sub-hepatic caecum and cysto-colic folds of peritoneum, there are no reports in the literature on the occurrence of all the three in the same individual. An individual having all the three variations is really unfortunate because he or she can have sigmoid colon volvulus, may have functional, clinical and surgical problems related to appendix and gallbladder.

References


