Case report

OA Anatomy
Open Access

Developmental Anatomy

Subhepatic caecum: Its embryological basis and clinical implications

S S Das[1*], B Pangtey[1], S Mishra[1]

Abstract

Introduction

Congenital abnormalities of the intestine are common. Most of them are anomalies of gut rotation, non-rotation or malrotation that result from incomplete rotation and/or fixation of the intestines.

Case Report

We have found a rare abnormality of caecum, which was present in the sub hepatic region with the presence of short ascending colon during routine dissection classes for undergraduate students in a 60 year old male cadaver.

Conclusions

When this developmental misplacement is associated with appendicitis, it can lead to misdiagnosis and severe complications during operations. Awareness of nature and characteristics of this anomaly should be known to surgeons and radiologists. We have explained the embryological basis of such unusual position of the caecum and have commented on its clinical importance for surgery.

Introduction

During development, midgut undergoes rotation and fixation of parts to assume adult position. The caecum descends with the relative diminution of size of right lobe of liver so that the caecum reaches the right iliac fossa. Derangements may occur at any stage. Complete non descent of the caecum and appendix is noteworthy as a source of appendicitis which occasionally occurs in the upper right abdomen.

Case Report

During routine cadaveric dissection of abdomen in a 60 year old male performed with first year under graduate Bachelor of medicine and bachelor of surgery students, we observed the presence of caecum in the sub hepatic region below the right hepatic lobe with short ascending colon. Length of ascending colon was 5.6 cm. The terminal part of ileum was extending from right iliac fossa to the sub hepatic region to reach caecum. Other structures were normal in position (Figure 1). This work conforms to the values laid down in the Declaration of Helsinki (1964). The protocol of this study has been approved by the relevant ethical committee related to our institution in which it was performed. All subjects gave full informed consent to participate in this study.

*Corresponding author
Email: susvick@gmail.com

[1] Maulana Azad Medical College, New Delhi, India

Discussion

During the sixth to tenth week of embryonic life, the gut tube grows at a faster rate than the abdominal cavity; therefore, a portion of the midgut normally projects into the umbilical cord as primary intestinal loop. At about the tenth week the abdominal cavity grows at an accelerated rate and the mid-gut is withdrawn into it. The proximal portion of the jejunum is the first part to reenter the abdominal cavity. As it recedes into the abdomen it rotates in a counter-clockwise direction thus it comes to lie on the left side. The later returning loops gradually settle more and more to the right. The caecal bud, which appears at about the sixth week as a small conical dilation of the caudal limb of the primary intestinal loop, is the last part of the gut to reenter the abdominal cavity. By the eleventh week, the cecum and the first portion of the colon momentarily lies in the right upper quadrant directly below the right lobe of the liver. Subsequently, cecum descends into the right iliac fossa, placing the ascending colon and hepatic flexure on the right side of the abdominal cavity. After this rotation is completed, the ascending mesocolon and the descending mesocolon both fuse to the back wall of the abdomen[1,2,3,4,5].

A subhepatic cecum is an abnormality of the third stage of rotation of the mid-gut due to failure of the cecum to elongate and descend into the right iliac fossa. The possible cause may be due to an intrinsic growth defect in the ascending colon or in failure of the caecum to become attached to the growing posterior abdominal wall[2,3,4,5,6]. The common varieties of caecal abnormalities are sub hepatic caecum as in this case, lumbar caecum, pelvic caecum. Literature for sub–hepatic caecum is relatively infrequent. In 1892, Lockwood reported one case studied at autopsy. Treves in 1885, described two cases studied at autopsy, and later Robinson reported 2 cases in the study of 130 subjects. In 1911, Smith reported in autopsy studies of 1050 infants that failure of descent of the caecum occurred in 6%. In 2013, Nagashree reported one case during routine dissection with absent ascending colon. Some surgeons have also accidently discovered occasional cases at the time of operation[7]. We are reporting a subhepatic caecum.

Most cases of subhepatic cecum are asymptomatic and remain unnoticed. But they may be of surgical importance. As the appendix occupies a high position, appendicitis in such person would be difficult to diagnosis as the pain will be localized in right upper quadrant which may mimic acute cholecystitis. If with the cecum in this position there is also failure of fixation of the small intestine mesentery on to the posterior abdominal wall, volvulus of all of the

Competing interests: None declared. Conflict of interests: None declared.
All authors contributed to conception and design, manuscript preparation, read and approved the final manuscript.
All authors abide by the Association for Medical Ethics (AME) ethical rules of disclosure.

FOR CITATION PURPOSES: *Das SS, Pangtey B, Mishra S. Subhepatic caecum: Its embryological basis and clinical implications. OA Anatomy 2014 Oct 19;2(3):27.*

OA Anatomy
Open Access

small intestine may occur[7,8,9]. Scanty consideration is given to this developmental anomaly as a cause of symptoms in adults. Failure to identify these misplacements may lead to grave errors in procedure, or to detrimental prolongation of the operation.

Conclusion

To conclude, some degrees of developmental mislocations of portions of the midgut are enormously common. Rarely reported primary sub hepatic cecum and the unusually located appendicitis associated with it may lead to diagnostic delays. Hence surgeons should be aware of these types of variations to avoid unfamiliar complications.

References

1.Sadler TW. Digestive system. In: Christilda F, Ashok S, Shakuntala RP, Pritha SB, Gangane SD, Shashi W et al. editors. Langman's medical embryology. 11th ed. New Delhi: Wolters Kluwer; 2009.p. 223-9.
2.Moore KL, Persaud TVN. The digestive system. In: Moore KL, Persaud TVN. editors. The Developing Human clinically oriented embryology. 8th ed. New Delhi: Elsevier ;2008.p.218.
3.Boyd HJD, Mossman HW. In Boyd HJD, Mossman HW et al. editors. Human Embryology. 3rd ed. University of California.1976;p.355-9.
4.Larsen W.J. Development of the gastrointestinal tract. In: Schoenwolf G.C., Bleyl S.B., Brauer P.R., Fracis-West P.H. Larsen's Human Embryology. 4th Edition. Philadelphia, Churchill Livingstone Elsevier.2009;p.446-8.
5.Standring S, ed. Gray's Anatomy.40th Ed., New York, Churchill Livingstone. 2010;p.1144.
6.Clarence E. Gardner, Jr. The Surgical Significance of Anomalies of Intestinal Rotation. Ann Surg. Jun 1950;131(6):879–96.
7.Nagashree MV, Gireesh, Subhash LP, Pai V. Journal of Clinical and Diagnostic Research. 2013 Sept;7(9):1992-3.
8.Fitzgerald MJT, Nolan JP, O'Neill MN. The position of the human caecum in fetal life. J. Anat. 1971;109(1):71-4.
9.Allen K. Subhepatic appendicitis. Arch Surg. 1955;71(2):265-7.

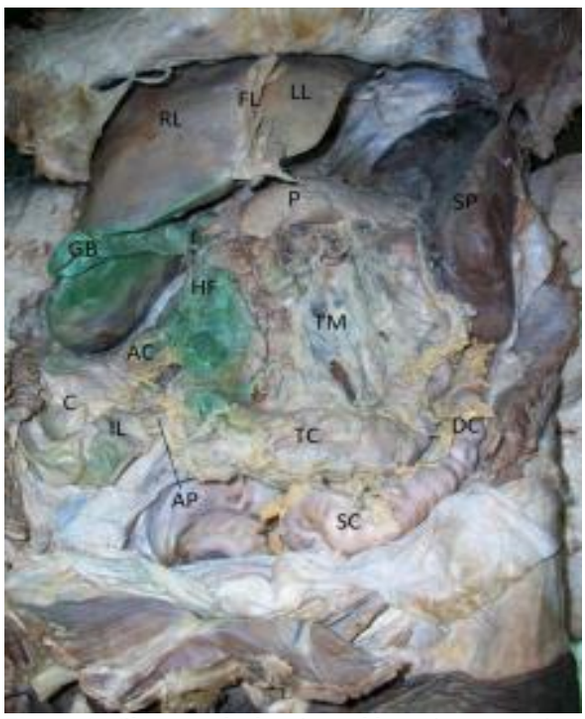

Figure 1: Photograph showing subhepatic caecum in a 60 year old male cadaver. C caecum, IL terminal part of ileum, AP appendix, AC ascending colon, HF hepatic flexure, RL right lobe of liver, LL left lobe of liver, FL falciform ligament, TC transverse colon, SC sigmoid colon, DC descending colon, TM transverse mesocolon, P pancreas, GB gall bladder.

Competing interests: None declared. Conflict of interests: None declared.
All authors contributed to conception and design, manuscript preparation, read and approved the final manuscript.
All authors abide by the Association for Medical Ethics (AME) ethical rules of disclosure.

FOR CITATION PURPOSES: *Das SS, Pangtey B, Mishra S. Subhepatic caecum: Its embryological basis and clinical implications. OA Anatomy 2014 Oct 19;2(3):27.*