UNDESCENDED INFANTILE CAECUM - A CASE REPORT

Akhilandeswari Balasubramanian, Nandhini Venkatachalam

Department of Anatomy, Bangalore Medical College and Research Institute, Fort, Bangalore, KA, India

E-mail of Corresponding Author: akhilandeswarib@gmail.com

ABSTRACT

The Caecum is the commencement of the large intestine. It is the large cul-de-sac which lies in the right iliac fossa and continues with the ascending colon at the level of the ileal opening. Normally caecum lies in on the peritoneal floor of the right iliac fossa and its lower end lies at the pelvic brim. The shape of caecum has been classified into four types, i.e., conical, quadrate, 90% normal, and ampullary 4% by Treves. During routine cadaveric dissection by I MBBS students at BMCRI Bangalore, a variation is seen in a 60 year old female cadaver. The caecum is conical in shape and found in the right lumbar region. Length of the caecum is 5 cm and breadth 5.25 cm. The appendix is retrocaecal and its length 6 cm. This variant shape and position of the caecum can be explained on an embryological basis. The congenital anomaly of undescended caecum gives rise to confusion in diagnosis of appendicitis. The Mc Burneys point used for locating the tenderness of appendicitis totally depends on the normal position of the base of appendix. Despite extraordinary advances in modern radiographic imaging, diagnosis of acute appendicitis remains an enigmatic challenge. Knowledge of variable positions of caecum and appendix will help in diagnosing cases of appendicitis with atypical presentations and in planning proper incisional techniques preoperatively.

Keywords: Caecum, undescended caecum, conical caecum, appendix.

INTRODUCTION

The Caecum is the commencement of the large intestine. It is the large cul-de-sac which lies in the right iliac fossa and continues with the ascending colon at the level of the ileal opening on the medial side and below this with the vermiform appendix. Its average axial length is 6 cm and breadth about 7.5 cm usually the caecum is covered by peritoneum on all sides.

Normally caecum lies in on the peritoneal floor of the right iliac fossa and its lower end lies at the pelvic brim.

The shape of caecum has been classified into four types according to Treves 1885.

Anatomical and topographical variations of the caecum are known to occur. Appendicitis is one of the most common clinical conditions that require emergency surgery. Variations in anatomical location of appendix can result in different clinical presentations and the ultimate position of the appendix is influenced by the caecum, which varies in contour and even in position.

Surgeons performing abdominal operations in adults and children require a thorough knowledge of normal anatomy and variations of the caecum and appendix. It helps them to make optimal diagnosis of various pathological conditions related to these organs and treat accordingly.

MATERIALS AND METHODS

During routine cadaveric dissection by I MBBS students at BMCRI Bangalore, a variation is seen...
in a 60 year old female cadaver. The anterior abdominal wall doesn’t not show any surgical scar and when opened a variation in the position and shape of the caecum is found. The position of the caecum and its shape is noted down. The length of the caecum is measured from a horizontal line at the level of ileocaecal orifice to its lowest point and width taken at midregion. The length of the mesentery is noted. The position and dimensions of appendix and colon are also noted, measured and photographed.

CASE REPORT
The caecum is conical in shape and found in the right lumbar region. Its peritoneal coverings are normal. Length of the caecum is 5 cm and breadth is 5.25 cm. The appendix is retrocaecal and its length 6 cm. The appendicular orifice is 2.75 cm posteromedial to the ileocaecal junction and the length of the root of mesentry is 10 cms.

The arteries supplying caecum and appendix are normal.

The ascending colon measures about 12.5 cm in length and 10 cm in width, transverse colon 47.5 cm in length, descending colon 27.5 cm in length and the sigmoid 32.5 cm.

DISCUSSION
Shape of caecum
The shape of caecum has been classified into four types according to Treves 1885.
First type- Infantile (conical) type 2%
Second type- quadrate type 3%
Third type- normal 90%
Fourth type- ampullary exaggerated type 4%

According to Pavlov and Petrov 1968, the third type was called ampullary 78% and infundibular type similar to conical type was 13%, 9% was intermediate. Three general types of caeca, (1) the infantile; (2) that prevailing in early childhood; and (3) the adult, may be regarded as a developmental sequence. The factors of intrinsic growth and of gravity (weight-bearing of caecal contents) are considered in the evolution of the caecum from infantile to adult types.

In a study conducted by Banerjee et al., the shapes of the caeca were found to be normal/ampullary in 88%, exaggerated in 8% and 4% conical.

In the present case the caecum was conical in shape and the appendix arose from its apex. The appendix was retrocaecal in position and normal in length.

The ultimate position of the appendix is influenced by the caecum, which varies in contour and even in position, as a result not only of type but also of peristaltic activity, state of filling and other physiologic conditions.

The present case of conical caecum results in a variant positioning of the base of appendix, whose normal anatomy is usually utilized in diagnosing and treating a case of appendicitis.

Position of Caecum
Normally the caecum lies in the right iliac fossa.

In the present case it was found in the right lumbar region.

In a study conducted by Delic et al., conical caecum was found in 56% cases and square type of caecum in 44% of cases. It was constant in its position in right iliac fossa in 100% of the investigated cases. The vermiform appendix was attached to the tip of the caecum in 58% of cases, to the medial wall in 32% of cases and to lateral wall in 10% of cases.

In a study, done on 25 cadavers, 96% of the caeca were found in Right iliac fossa and 4% in subhepatic position. In all cases of subhepatic caecum the right colic artery was absent and middle colic supplied both the caecum and appendix.

The dimensions of the caecum was an average of length 6 cms and breadth 7.5 cms according to earlier authors.

A retrocaecal appendix of 60% incidence is cited by Datta.
The shortening of mesentery associated with an undescended caecum can increase the frequency of a volvulus like non rotation than in normal persons7. In the present case, length of root of mesentery was 10 cms i.e shorter than the usual of 15 cms. This variant shape and position of the caecum can be explained on an embryological basis.

Normal Development
At the end of second stage of midgut rotation 10th-12th week, caecum is the last to enter the abdominal cavity and at first lies near the midline high up. It grows then to the right and comes to lie under the liver. With the subsequent growth and elongation of the colon the caecum reaches the right loin.

Normally during third stage of midgut rotation between 11th week and just after birth, the caecum descends into the right iliac fossa and undergoes fixation. After birth the wall of the caecum grows unequally and the appendix comes to lie on its posteromedial aspect8.

**Derangement of third stage of rotation**
Due to faulty rotation of the midgut, caecum may occupy abnormal positions – left iliac fossa, umbilical region, subhepatic region, right lumbar region and in pouch of douglas6.

Rarely the caecum may lie at the level of the right colic flexure, the ascending colon is then absent9. Too early fixation causes imperfect descent. So the caecum may be subhepatic or right lumbar.

Deficient fixation causes pelvic caecum2,8. Undescended caecum is the most common anomaly of intestinal rotation and more common in males10.

**Comparative anatomy**
The caecum is much longer in herbivorous mammals than carnivores. In anthropoid apes and in man it is smaller in size and its lower end regresses to form vermiform appendix. Its anterolateral wall grows out of proportion to its posteromedial wall11.

**CONCLUSION**
The caecum being conical and lumbar in position in the present case may be due to derangement in third stage of rotation and early fixation of midgut. Further the normal unequal growth of the caecal walls after birth did not happen, thus leading to a conical caecum.

The congenital anomaly of undescended caecum gives rise to confusion in diagnosis of appendicitis. The Mc Burneys point used for locating the tenderness of appendicitis totally depends on the normal position of the base of appendix. In this case both the shape and position of caecum contribute to a variant location of the appendicular base.

The pain of appendicitis for example although initially starting in umbilical region may not shift to right iliac fossa but to right upper quadrant mimicking cholecystitis12. Despite extraordinary advances in modern radiographic imaging, diagnosis of acute appendicitis remains an enigmatic challenge. A knowledge of variable positions of caecum and appendix will help in diagnosing cases of appendicitis with atypical presentations and in planning proper incisional techniques preoperatively. This avoids unnecessary extensions of the conventional grid iron incision.

**ACKNOWLEDGEMENTS**
Authors acknowledge the great help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed. Authors are grateful to IJCRR editorial board members and IJCRR team of reviewers who have helped to bring quality to this manuscript.

**REFERENCES**
Figure no.1: Conical caecum in Right Lumbar Region, empty RIF (right iliac fossa) seen. Appendix retrocaecal.

Figure no.2 - Types of caecum according to Treves