



## MICROSCOPIC FEATURES OF HUMAN FETAL CAECUM AT DIFFERENT GESTATIONAL AGES

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**ABSTRACT** **INTRODUCTION:** Caecum is a small pouch which plays an important role in absorption of fluids and helps in cellulose digestion. The expansive nature and sac-like morphology of the caecum permits storage of large volumes of semi-liquid chyme that enters from the small bowel via the ileocaecal valve.

**AIM:** The main aim of this study to calculate approximate detailed microscopic features of human fetal caecum at different gestational ages.

**MATERIALS AND METHODS:** For this present study 25 caecum specimens were collected from the human aborted foetuses of 17 – 40 weeks gestational ages and both sexes were studied and caecum were processed for routine histological tissue processing and sectioning and the slides were stained with haematoxylin and eosin.

**RESULTS:** The wall of the caecum presented well differentiated four layers mucosa, submucosa, muscular coat and serosa from the 17th week fetus onwards. At 17 weeks wider lumen and thick wall were observed. Histological structure of caecum at 17 weeks gestational age presented well differentiated mucosa, submucosa, muscular coat and serosa. Villous appearance of mucosa was observed at 17 weeks and disappeared at 20 weeks a finding differing from that reported in the literature. In the present study there is delay in the time of appearance and differentiation of muscularis mucosae when compared to the literature.

**CONCLUSION:** A review of literature did not show any articles on histogenesis of caecum at different gestational ages.

**KEYWORDS :** Histogenesis, Gestational age, lymphoid follicle, Human Fetus, Large intestine.

### INTRODUCTION:

The caecum is a pouch, connecting the ileum of small intestine with the ascending colon of the large intestine and is located in the right iliac fossa. It is separated from ileum by the ileo-cecal valve (ICV) and is considered to be the beginning of the large intestine. Instead of villi, caecum and large intestine is composed of densely packed straight tubular glands in the mucosa. Caecum and large intestine contains plentiful, well-organized lymphoid tissue in the mucosa. The present study histological features of the caecum in human fetuses of both sexes and different gestational ages conducted as no literature was available on these aspects in Indian population.

### MATERIALS AND METHODS:

**Study design:** Total 25 formalin preserved aborted foetuses of 17 weeks to full term obtained from MallaReddy Narayana Multispeciality Hospital with relevant obstetric records available in the Department of Anatomy, MRMCW, Hyderabad were utilized for the present study. The collected samples were categorized into three gestational age groups <20 weeks, 21-30 weeks, >31 weeks. The caecum was preserved in 10% formal saline. From each group fresh caecum was selected for histological study. A small bit of tissue from caecum was placed flat on a metallic tray and processes for routine histological tissue processing, sectioning and the slides were stained with haematoxylin and eosin. The sections of caecum were observed under photomicrography microscope model DB2-180M for the appearance of various layers, epithelial cell shape and presence of goblet cells, intestinal glands and lymphoid tissue distribution. The representative fields were photographed by using microscope with photo micrographic unit attachment. (Fig.1)



Fig.1 Photo micrographic unit

### Results:

**Caecum:** The wall of the caecum presented well differentiated four layers mucosa, submucosa, muscular coat and serosa from the 17th week fetus onwards. At 17 weeks wider lumen and thick wall were observed (Fig.2). The surface epithelium is columnar with slight striated appearance and presence of goblet cells. The intestinal glands are longer and more closely packed making the mucosa thicker (Fig.3). The glands are arranged in thick, vertical columns. The cells in the depths of glands are undifferentiated and signs of mitosis were present. Lymphocytic infiltration in lamina propria was observed. Muscular coat presented thicker inner and thinner outer layers (Fig.4).

At 20 weeks the surface of mucosa is smooth (Fig.5). Surface epithelial striated border is more prominent (Fig.6 and 7). There is increase in thickness of mucosa. The glands are longitudinal in orientation and are more closely packed (Fig.8) at 24 weeks. Mitoses in epithelial cells observed at 24 weeks (Fig.9). Well differentiated muscle coat with both layers of uniform thickness were observed at this age. From 27 weeks submucosal folds were present (Fig.10). Muscular coat is thicker.

Fig. 2: Caecum at 17 weeks (4x)

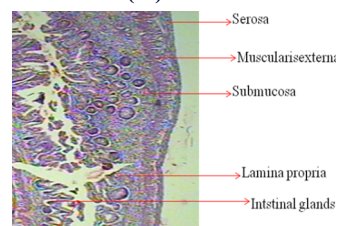
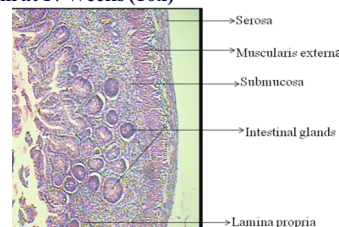
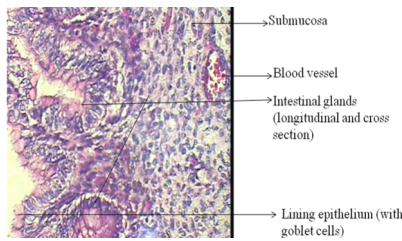


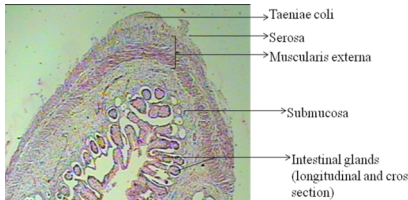
Fig.3: Caecum at 17 Weeks (10x)



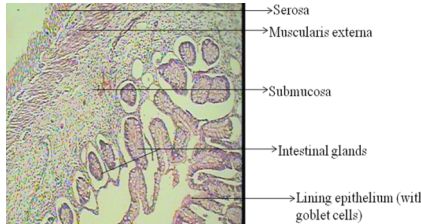
**Fig.4: Caecum at 17 Weeks (40x)**



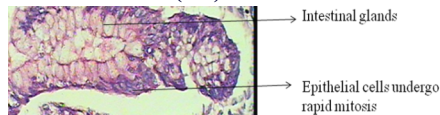
**Fig.5: Caecum at 20 weeks (4x)**



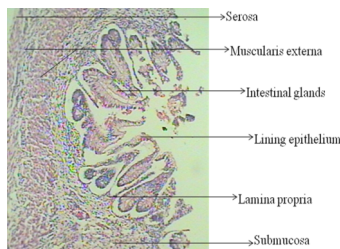
**Fig.6: Caecum at 20 Weeks (10x)**



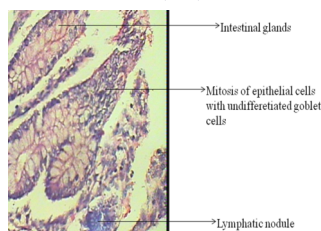
**Fig.7: Caecum at 20 Weeks (40x)**



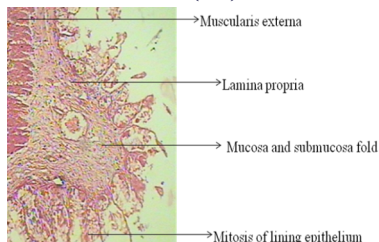
**Fig.8: Caecum at 24 Weeks (10x)**



**Fig.9: Caecum at 24 Weeks (40x)**



**Fig.10: Caecum at 27Weeks (10x)**



**DISCUSSION:**

The wall of the caecum presented well differentiated four layers mucosa, submucosa, muscular coat and serosa in the 17<sup>th</sup> week fetus onwards. At 17 (Fig.2) villous appearance of mucosa was observed. According to (Horowitz. et. al., 1933) [10], a villous process appears on

the mucous membrane in the fourth month and disappears in the sixth month. In the present study they were seen at 17 weeks and disappeared at 20 weeks. The Surface epithelium is columnar with clear evidence of striated border at 20 weeks. Intestinal glands are longer and more closely packed. Lymphocytic infiltration in lamina propria was observed (Fig.4) at 17 weeks and solitary lymphatic follicles were observed at 24 weeks. From 27 weeks submucosal folds were present (Fig.10). A review of literature did not show any articles on histogenesis of caecum at different gestational ages.

**CONCLUSION:**

A review of literature did not show any articles on histogenesis of caecum at different gestational ages. Histological structure of caecum at 17 weeks gestational age presented well differentiated mucosa, submucosa, muscular coat and serosa. In the present study there is delay in the time of appearance and differentiation of muscularis mucosae when compared to the literature.

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