

## A Human Embryo of Streeter Age Group XIII

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**= Abstract =** A human embryo considered to belong to the age group XIII was described briefly. The findings of this embryo generally conformed to those of a previous report at the same stage with a few additional findings such as primordial germ cells described. This embryo did not show any notable developmental anomalies. Thus I concluded that this embryo had been under normal development.

**Kew words:** *Embryo, Streeter age group, Primordial germ cells*

### INTRODUCTION

Streeter (1942; 1945) introduced the concept of 'developmental horizon', which was based on the correlation between the embryonic age and the developmental status of the internal organs. Although there has been uncertainty about the age of embryos in some stages or horizons, his classification provides a major criteria in determining the age of embryo and is generally accepted at least in the early period of organogenesis.

In this report, an embryo that belongs to age group XIII is described to complement a previous report of the same age group (Chi and Ham 1985) and to present additional findings.

### DESCRIPTIONS OF EMBRYO

The embryo, measured 5.0 mm in crown-rump length, was incidentally found in a hysterectomy specimen of a 29 years old female. Unfortunately, no other information is available in this case. This embryo was fixed in 10% formalin and sectioned serially from the right side to the left in 7  $\mu$  m thickness. A total of 180 sections was obtained and stained with hematoxylin and eosin. Both the rostral and caudal parts of the embryo were well preserved, but the middle third was damaged during tissue handling, which divided the embryo into 2 parts with partial loss of the viscera. During the

embedding procedure the rostral half rotated to the left side slightly, and the caudal half tilted to the left side with slight rotation to the right. The reconstruction was made with 180 sections.

#### External appearance

The external appearance was deduced from reconstruction. The embryo showed C-shaped curvature (Plate 1), and there were arm buds and a left leg bud. The future head portion showed prominent 3 pairs of pharyngeal bars (Plate 2). Although the middle portion of the embryo was partially damaged, the hepatocardiac bulge was prominent.

#### Nervous system

Both neuropores were already closed. The neural tube showed cephalic and cervical flexures, demarcating 3 primary brain vesicles and the spinal cord. From the neural tube optic vesicles evaginated laterally, showing primitive divisions of the retina and optic stalk. The retina was still a flat disc. The skin ectoderm superficial to the retina was slightly thickened, indicating the future lens of the eye. The otic vesicles were completely closed. But there was some remnant of ectodermal stalk in the right vesicle, and the left vesicle was still attached to skin ectoderm. There were trigeminal, acousticofacial, and glossopharyngeal ganglia, directed toward the responsible pharyngeal bars respectively. Also there was vagal ganglion (Plate 2).

#### Gut tract and its derivatives

The pharyngeal region had acquired communication with the amniotic cavity. There was en-

dodermal thickening in the floor of the pharynx and downward invagination, indicating the beginning of the median thyroid (Plate 3). Caudally to the pharynx, the lung bud developed from the tracheoesophageal junction (Plate 4), but it was impossible to trace the whole length of the lung bud, because the embryo was damaged during tissue handling. Nevertheless, the gut tract distal to the esophagus was clearly qualified. There were the stomach, the gallbladder, and the dorsal and ventral pancreatic buds (Plate 5,6,7), and the epithelial trabeculae of the hepatic diverticulum was prominent in the matrix of mesenchyme of the septum transversum. At the midgut caudal to the gallbladder, there was junction to the yolk sac.

#### **Cardiovascular system**

The heart chambers were filled with blood cells. Although it was difficult to reconstruct the whole length of the cardiac loops because of the aforementioned damage, the trabeculation of the ventricle made it distinct from the atrium. At the borders of the atrioventricular canal, the gelatinous endocardial cushions appeared. But there was no true valvular structure (Plate 8).

#### **Urogenital system**

The mesonephros and the mesonephric ducts were observed along the posterior wall of the coelomic cavity (Plate 9), but there was no metanephros or ureteric bud. At the splanchnic mesoderm surrounding the hindgut, the primordial germ cells were observed. Owing to their large and round appearance, the germ cells under migration to the genital ridge were distinct from the surrounding mesodermal cells (Plate 10).

#### **Other systems**

The exact numbering of the somites was impossible. The somites had differentiated into the dermatomes, myotomes, and the sclerotomes.

### **DISCUSSION**

Although there was no additional information ab-

out the maternal history and the embryo was damaged, this embryo appeared to be under normal development and the findings were sufficient to determine its age group. In this embryo, the arm buds and the left leg bud were observed, which placed the embryo at a stage older than stage XII. In the age group XIV, however, the arm buds are paddle-shaped and the lens pits and the optic cups are present. Thus this embryo which showed no characteristics of age group XIV belongs to age group XIII.

Comparing to a earlier report of the same age group embryo by Chi and Ham (1985), this embryo showed the findings which generally conformed to theirs. In this embryo, however, only one leg bud was observed and the left otic vesicle was still attached to the skin ectoderm. Thus this embryo is thought to be slightly younger in the age group XIII than the embryo in the previous report.

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= 국문초록 =

## 배아(Streeter 연령군 XIII)의 1예

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박경한

Streeter 연령군 XIII에 속하는 배아에 대하여 간략히 기술하였다. 배아는 동일 연령군에 속하는 배아에 관한 과거의 보고와 일반적으로 일치하는 소견을 나타내었고 원시 성세포 등의 다른 소견들도 관찰되었다. 배아는 뚜렷한 이상소견을 보이지 않았다. 따라서 저자는 배아가 정상 발육상태였음을 결론지었다.

### LEGENDS FOR PLATES

- Plate 1. Section at nearly midplane. X40
- Plate 2. Head portion showing pharyngeal bars. Trigeminal ganglion (arterisk), acousticofacial ganglion (large arrowhead), glossopharyngeal ganglion (small arrowhead), vagus ganglion (double arrowhead), O:otic vesicle. X200
- Plate 3. Median thyroid (arrowhead). X400
- Plate 4. Tracheoesophageal junction. X250
- Plate 5. Gallbladder (arrowhead). X125
- Plate 6. Dorsal pancreatic bud (arrowhead). X125
- Plate 7. Ventral pancreatic bud (arrowhead). X125
- Plate 8. Heart. A:atrium, V:ventricle. X320
- Plate 9. M:mesonephros and mesonephric duct (arrowhead). X250
- Plate 10. Primordial germ cell (arrowhead). X400



