Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2017; 5(3): 360-362

Received: 21-03-2017
Accepted: 22-04-2017

A Deka
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Kabita Sarma
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

J Rajkhowa
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

J Ahmed
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

S Sinha
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

J Kachari
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Correspondence
A Deka
Department of Anatomy & Histology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Macro anatomical study on the heart of Asian elephant calf (*Elephas maximus*)

A Deka, Kabita Sarma, J Rajkhowa, J Ahmed, S Sinha and J Kachari

Abstract
The present studies were conducted in the heart of Asian Elephant calf (*Elephas maximus*). The heart of the animal were obtained from Delaishree, Sonitpur East Division, Diplonga range office and Pakke Tiger reserve forest, Arunachal Pradesh, respectively. The hearts of Asian Elephant were collected at the time of post mortem and gross anatomical studies were made on it. Grossly, the heart of Asian Elephant calf (*Elephas maximus*) composed of base and apex which were bifid. The heart consisted of four chamber viz., right atrium, right ventricle, left atrium and left ventricle. The right atrium consisted of four chief opening, deep fossa ovale, intervenous crest, crista terminalis and musculi pectineti. The right atrioventricular opening contained tricuspid valve. Right ventricle presented three numbers of bifid papillary muscle, chordae tendinae and distinct trebeculae coronae muscle. The left atrium contained opening of pulmonary vein. The left ventricle presented bicuspid valve, chordae tendinae and two numbers of papillary muscles.

Keywords: Macro, anatomical, heart, Asian, elephant, calf

1. Introduction
The Asian Elephant (*Elephas maximus*) is an endangered animal and its population is decline due to degradation, fragmentation and loss of habitat as well as poaching. (Choudhury *et al.*, 2008) [2]. The population of Asian elephant in India is 2600-3000 and in Kaziranga National park is 500 which one is the largest National park of Assam (2011 Census). The heart is the main organ of cardiovascular system. Being an endangered animal of wildlife and very scanty literature is available on the detailed anatomy of heart of Asian elephant Calf. Hence, the present study was designed to establish anatomical norms on the heart of Asian Elephant calf.

2. Material and Methods
In the present study, two numbers of hearts of Asian Elephant calf were utilized. These hearts were collected from Delaishree, Sonitpur East Division, Diplonga range office and Pakke Tiger Reserve Forest, Arunachal Pradesh, respectively at the time of post mortem examination. After collection of heart gross anatomical studies were made on it.

3. Results and Discussions
Grossly, the heart of the Asian Elephant calf (*Elephas maximus*) was oval shaped (Fig.1). Similar findings were reported by Sarma *et al.*, (2009) [1] in Asian elephant. The heart composed of base and apex which were bifid (Fig.2). However, Sarma *et al.*, (2009) [1] reported that the apex of heart was single in Asian elephant calf. It might be due to individual variation. The heart consisted of four chamber *viz.*, right atrium, right ventricle, left atrium and left ventricle. The right atrium consisted of cranially anterior vena cava, caudally posterior venacava, coronary sinus and right atrioventricular opening. The coronary sinus was located just below the opening of the posterior venacava (Fig.3). The deep fossa ovalae situated near the intravenous crest (Fig.4). These findings were in accordance with the findings of Dyce *et al.*, (1987) [5] in dog. The intravenous crest was located between the termination of anterior and posterior vencava. The crista terminalis was situated at the termination of anterior venacava and from the crista terminalis honey comb like pectinate muscle was extended towards the auricle. The right atrioventricular opening contained tricuspid valve. These findings were similar to the findings of Konig and Liebich (2009) [3] in horse. The wall of the right ventricle was thin compared to the left ventricle and it forms the cranial most part of the heart. The right ventricle presented three numbers of papillary muscle, single moderator band, chordae tendinae, distinct trebeculae coronae muscle, conus arteriosus and supraventricular crest (Fig.5). The chordae tendinae connected the papillary muscle with the tricuspid valve.

These findings were corroborated with the findings of Getty (2012) [4] in horse. The upper part of papillary muscle was bifid. The conus arteriosus was cone shaped opening and directed the flow of blood from the right ventricle to the pulmonary trunk. The supraventricular crest was located just above the right ventricle (Fig.6). The left atrium contained opening of pulmonary vein (Fig.7). The wall of left ventricle was thick compared to the right ventricle. The left ventricle composed of bicuspid valve, moderator band, chordae tendinae and two numbers of papillary muscles. The upper parts of the papillary muscles were divided into two parts where choradae tendinae were attached (Fig.8).

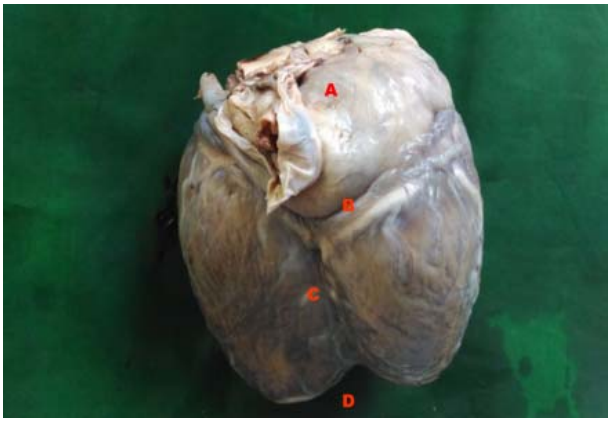

Fig 1: Photograph showing the Ex-situ position of base (A), Coronary groove (B), longitudinal groove (C) and bifid apex (D) of heart of Asian Elephant Calf.

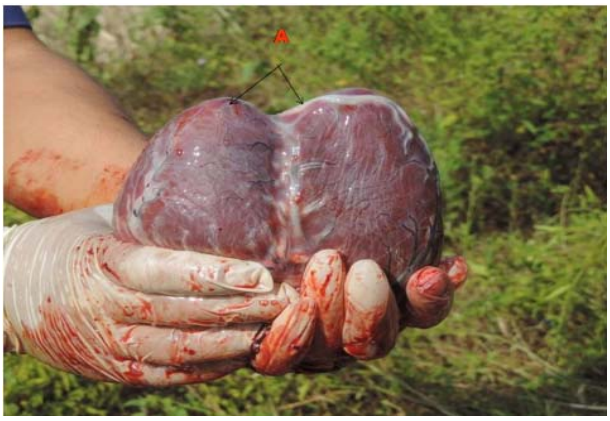

Fig 2: Photograph showing the Ex-situ position of base (A) of heart Asian Elephant calf

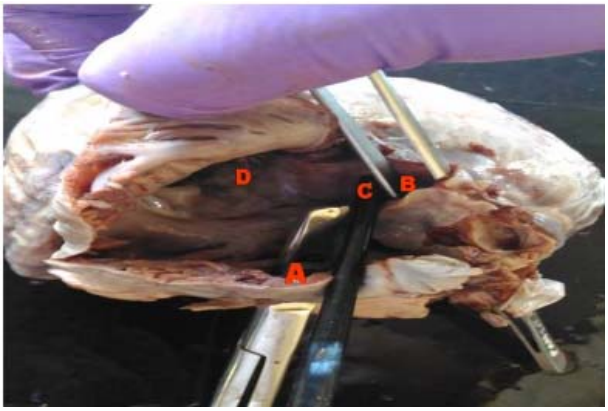

Fig 3: Photograph showing the opening of anterior venacava (A) opening of posterior venacava (B), coronary sinus (C) and right atrioventricular opeining (D) of right atrium of heart.

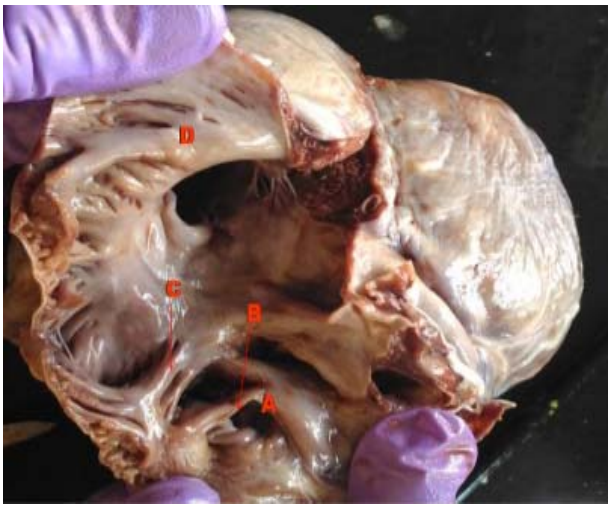

Fig 4: Photograph showing the fossa ovalae (A), intervenous crest (B), crista terminalae (C) and pectinate muscle (D) of right atrium of heart.

Fig 5: Photograph showing the TRICUSPID valves (A), chordae tendineae (B), papillary muscle(C) and moderator band (D) of right ventricle of heart.

Fig 6: Photograph showing the semi lunar valves (A) and supraventricular crest (B) and thin wall (C) of right ventricle of heart.

Fig 7: Photograph showing the opening of pulmonary vein (A) of left atrium of heart

Fig 8: Photograph showing the bicuspid valves (A), cordae tendineae (B), papillary muscle (C), trabeculae carneae (D) AND thick well (E) of left vemntricle of heart

4. Summary and Conclusion

The heart of Asian Elephant calf was ovoid shaped and apex was bifid. The upper parts of papillary muscles of ventricles were bifid.The trabeculeae carnae muscles were very distinct. The fossa ovalaes were deep. These studies will be helpful to wildlife veterinarian about the basic information of gross anatomy of heart of Asian elephant calf.

5. Reference

1. Sarma M, Kalita SN, Sarma KK. Gross anatomy of the heart of Asian elephant (*Elephas maximus*). Indian Journal of Veterinary Anatomy. 2009; 21:43-45.
2. Choudhury A, Choudhury LDK, Deasi A, Duckworth JW, Easa PS, Johnsingh AJT, *et al. Elephas maximus*, IUCN Red list of Threatened Species,2008; Version. 2016, 2.
3. Konig HE, Liebich HG. Veterinary Anatomy of Domestic Mammals.4th Edn. Schattauer, Stuttgart, Germany. 2009, 446.
4. Getty R. SISSON AND GROSSMAN'S The Anatomy of the domestic Animals.5th Edn. 2012; 1:560.
5. Dyce KM, Sack WO, Wensing CJD. Textbook of Veterinary Anatomy, W. B. Saunders Company. 1987, 217.

.