

## Original Research Article

### Gross Morphology of Placenta in Mare

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#### A B S T R A C T

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and  
Hippomanes

A 9 month old equine foetus collected from the gravid uterus of a 7 year old mare was utilized to observe the gross anatomical features. The placenta was typically Non Deciduate and Diffuse, where it was attached throughout the endometrium except for uterotubal junction and cervical star region. The placenta was characterized by string of pearls appearance because of the presence of chorioallantoic pouches. Completely separate amnion and chorioallantois containing hippomanes in their cavities was observed. Its umbilical cord was twisted four times and measured approximately 80 cm in length. The mare placenta was observed to have very rich supply of blood vessels. A small remnant of yolk sac was found to be at the junction of the allantois and umbilical cord.

#### Introduction

Horse belongs to the family Equidae. The female horse is called Mare. The placenta in mare can be classified under Non deciduate based on the association between the foetal part and maternal part of the placenta (Ginther, 1992). The maternal endometrium is not shed during parturition. It also can be further classified to be diffuse type of placenta because the chorionic villi (Microvilli) are diffusely scattered all over the chorion (Benerischke, 2006). Based on the histological degree of placental union, mare placenta is Epitheliochorial type (Mossman, 1987) where the chorionic villi occupy pits in endometrium and that the endometrial epithelium (maternal part) is in contact with the chorionic epithelium (foetal part). The avillous region of placenta was

not attached to the uterus in the cervical star region of uterus (Asbury and LeBlanc, 1993). The allantois was characterized by the presence of Hippomanes and pearl chain like allantoic pouches (Fig. 2). Yolk sac remnants were also noticed. The umbilical cord was 80 cm long and twisted four times before getting inserted at the junction of the horn and body of uterus (Benerischke, 2006). The placenta was richly supplied with blood vessels.

#### Materials and Methods

A 9 month old equine foetus was collected from the gravid uterus of a 7 year old mare brought for post mortem examination to the Veterinary College and Research Institute,

Namakal. The uterus along with foetus was utilized to observe the gross anatomical features. The single foetus along with placenta was collected and preserved in 10 % formalin and used to study the placental gross morphology. The gross anatomical features of the placenta, its contents and distribution of microvilli were studied. The length and twists of the umbilical cord was determined (Fig. 1).

## **Result and Discussion**

The placenta in mare had completely separate amnion and chorioallantois (Benerischke, 2006). The outer surface of chorion was smooth because of diffuse distribution of microvilli. The outer surface of chorion when observed under 4X magnification showed 1 to 2 mm polygonal areas. These polygonal areas were present throughout the chorionic surface. The polygonal areas contained diffusely distributed chorionic microvilli.

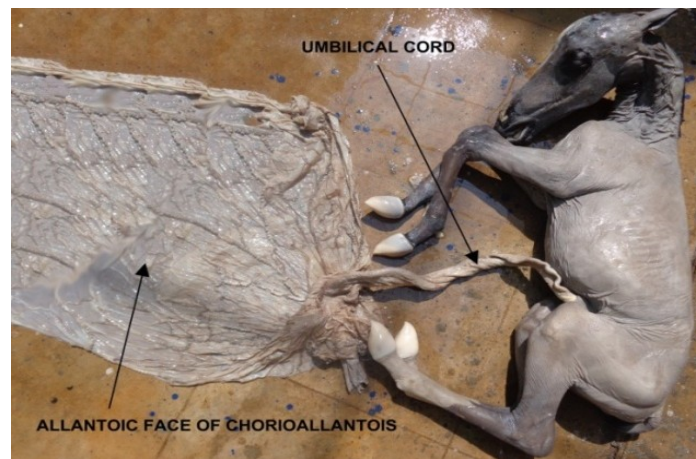
The avillous regions are located over large vessels, at the uterotubal junction and cervix (Benerischke, 2006). The appearance of the avillous region in cervix was star shaped called the cervical star. The placenta was not

attached to the uterus in the cervical star region (Asbury and LeBlanc, 1993).

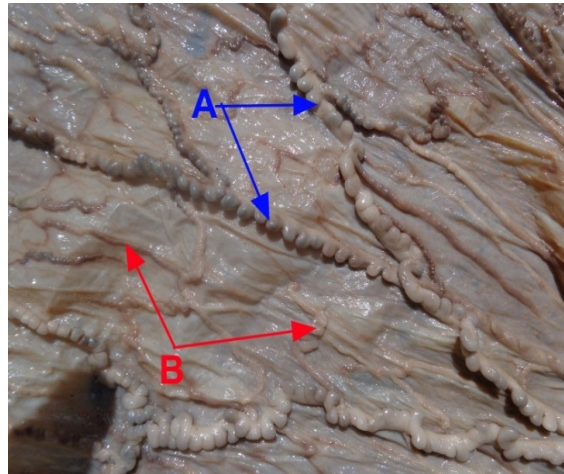
Early in gestation, between day 12 and 15, the equine embryo was round and moves freely throughout the lumen of both uterine horns in response to uterine contractions (Benerischke, 2006). According to Ginther (1992), such movement and contact between embryo and endometrium was thought to be significant part of maternal recognition of pregnancy in horses. Renfree, (1982) observed the fixation of embryo in one spot within the uterus at approximately 16<sup>th</sup> day of gestation.

Mossman (1987) described that equine foetus develops a full complement of extra embryonic membranes. During first 3-4 weeks of gestation, the yolk sac of the equine embryo was relatively larger than that seen in most other mammals (Steven, 1975). The allantois began to appear at about 20<sup>th</sup> day of gestation, after which it expanded rapidly and provided the dominant blood supply to the fused chorioallantois (Benerischke, 2006). According to Renfree, (1982) the fetal membranes attached to endometrium by around 40<sup>th</sup> day of gestation, and developed to its complete form by 150<sup>th</sup> day of gestation.

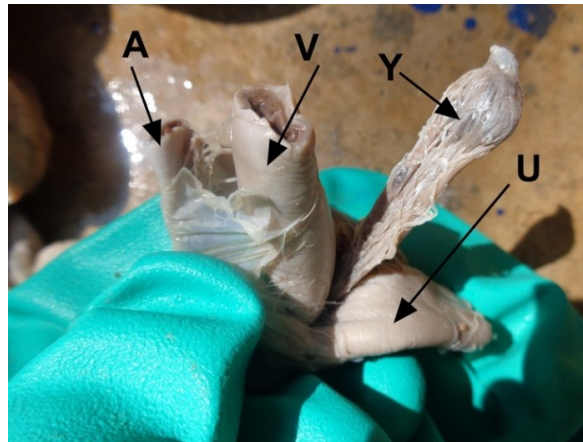
**Fig.1** showing placenta with foetus



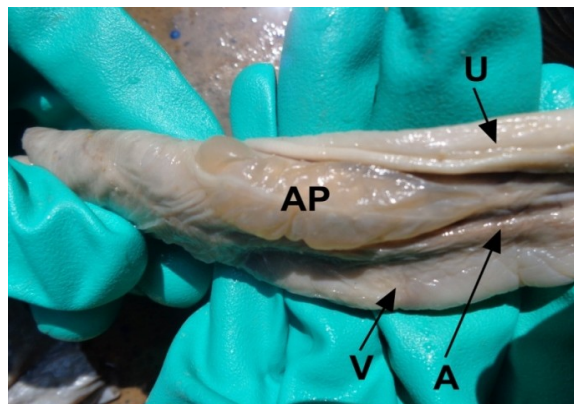
**Fig.2** showing allontoic face of chorioallontoic membrane. A. Allontoicpouches in the form of string of pearls. B. Blood vessels



**Fig.3** showing umbilical cord. A. Umbilical artery, V. Umbilical vein, Y- Remnant of yolk sac, U-Urachus



**Fig.4** showing umbilical cord near the umbilicus. AP- allontoic pouches, U-urachus, V- umbilical vein and A- umbilical artery



The avillous chorioallantoic pouches were formed around the chorion near the attachment of umbilical cord (Fig. 4). Hippomanes and allantoic pouches were often found in the horse allantois (Benerischke, 2006). According to Benerischke (2006), Hippomanes were proteinaceous soft calculi, present in all equine placentae. According to Steven (1975), Hippomanes were also noticed in placenta of cows, sheep and lemurs. Few hippomanes were found in the amniotic cavity (Ginther, 1992).

Yolk sac remnants were attached to the cord at the junction with the allantois (Fig. 3). The umbilical cord of the equine fetus was 80 cm long and twisted four times (Benerischke, 2006) before getting inserted at the junction of the horn and body of uterus. A rich vascularity of the placenta was noticed, which was typical of equine pregnancies (Fig. 2).

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