

<Case Report>

Reproductive System of a Pregnant Patagonian Mara (*Dolichotis patagonum*)

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ABSTRACT

Maras (*Dolichotis patagonum*) are monogamous and mate for life. A pregnant mara, 6.15 kg, died after forelimb amputation surgery at Seoul Zoo on February 28, 2009. In the bicornial uteri, two fetuses were found in each uterine horn. The placenta was chorioallantoic, hemochorial, discoidal and labyrinthic. The entrance of cervix had a deep fornix and no cervical folds were observed in the cervix. This report is the first about Patagonian mara and helpful for clinicians who deal currently or in the future with exotic pet animals.

(Key words : mara, *Dolichotis patagonum*, pregnant, reproduction)

INTRODUCTION

Patagonian mara (*Dolichotis patagonum*) is a relatively large herbivorous rodent native to South America and belongs to the *Caviidae* family like guinea pig and capybara (Ellerman, 1940; Landry, 1957; Mares and Ojeda, 1982). They are also known as "Patagonian cavy" or "Patagonian hare", and classified as "near threatened" by IUCN (International Union for Conservation of Nature) (Ojeda and Pardinas, 2008). Patagonian mara is different from other caviids by its almost hairless short tail, long ears, longer limbs, and radius longer than humerus (Ellerman, 1940; Wood and Patterson, 1959). Maras are well modified for walking or running in open grasslands and shrubland steppe (Mares and Ojeda, 1982; Ganslosser and Wehnelt, 1997). Like other wild animals, maras have been seriously affected by loss of its habitat for agriculture, hunting and competition with introduced herbivores in South America (Mares and Ojeda, 1982). The reason of hunting them is skins used for bedspreads and rugs (Wurster et al., 1971).

In certain states of USA, maras are allowed to be kept as pets. Cavy owners say they have strong bonds with their human caretakers, and are quite non-aggressive.

Owning an exotic pet is controversial also in Korea. Human desire to keep animal creatures close to them as companions and farm animals is so natural that thorough research on these animals must be followed by releasing them to the public.

The purpose of this retrospective study is to understand reproductive system of Patagonian mara in preparation for the

time when we have to share natural habitats with them.

CASE REPORT

A pregnant mara, 6.15 kg, died after forelimb amputation surgery at Seoul Zoo on February 28, 2009. In the bicornial uteri, two half-grown fetuses were found. Anal glands were found between anus and the base of tail same as in *Dolichotis*, whereas they are anterior to the anus in other caviids (Fig. 1., A). The uterus was bicornial (Fig. 1., B and C). The fornix was deep with the cervical entrance protruding (Fig. 1., E). Cervical folds were not present (Fig. 1., F). Two fetuses, body length of 6 cm, were located in each uterine horn (Fig. 1., B and C). The heads of fetuses directed posterior and fetuses were surrounded by amniotic and allantoic membranes. The placenta was composed with a maternal placenta and a chorioallantoic main placenta that was facing on the ventral region of the fetus (Fig. 1., D and G). Indents in uterine lumens were formed after removing fetuses along with chorioallantoic main placenta and subplacenta (Fig. 1., H). Two subplacentas protruded from chorioallantoic main placentas (Fig. 1., I). The umbilical cord was about 5 cm long that was connected with the opposite surface of subplacentas (Fig. 1., J).

DISCUSSION

Patagonian maras are the fourth largest rodent in the world after capybara, beaver, and certain porcupines (Nowak, 1999).

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They mate for life with same partners and males are always remaining close to females and fending off other males (Taber and Macdonald, 1992b; Nowak, 1999). Like a few of monogamous mammals, they have very brief estrus that occurs only once every 3 to 4 months and lasts only 0.5 h in semicaptive conditions (Taber and Macdonald, 1992a; Taber and Macdonald, 1992b). The brevity of the female's period of sexual receptivity would be one of critical factors leading maras to strong monogamy. The male seems to keep very close all the way to the female not to lose the chance to breed. The other caviés like yellow-toothed cavy, mountain cavy and rocky cavy have a promiscuous mating system (Rood, 1972).

In captivity, pairs reproduce three to four times a year and have one to three pups per litter (Weir, 1974; Ganslosser and Wehnelt, 1997). The young are born after 91 to 111 days in captivity and 100 days in the wild, fully furred, and eyes open (Taber and Macdonald, 1992a). They begin to walk almost immediately postpartum and can start grazing within 24 h of birth (Nowak, 1999). Pups born from as many as 15 pairs are remained in the same burrows and nursed under the social system of communal breeding for up to four months, a long lactation period for rodents (Taber and Macdonald, 1992a). The young pups quickly reach sexual maturity, 2 to 3 months for females and 6 months for males, and females first conceive at 8 months of age (Genest and Dubost, 1974; Nowak, 1999).

Patagonian maras are strong monogamous animals. To protect females, males mark females with urine and defend the ground near females with anal gland secretions and feces (Genest and Dubost, 1974). Anal dragging and urination for scent marking are common in maras and frequently observed during the breeding season at zoos.

Cautious attention and proper restraint are needed because Mara's teeth have sharp ends and continuously grow. Their dental formula is I 1/1, C 0/0, P 1/1, M 3/3, total 20 (Nowak, 1999) and the number of chromosomes is 64 (Wurster et al., 1974). The location of anal gland is between tail and anus that may be related with anal dragging behavior involving scratching and sniffing the ground with arched back (Fig. 1., A) (Taber and Macdonald, 1984). Uterus is bicornial and each fetus is located in each uterine horn (Fig. 1., B and C). As of desiduate placenta, fetuses with maternal placenta (thin arrows) were detached from uterine wall (Fig. 1., D). The entrance of cervix protruded long, by which uterine fornix was deeply formed and no cervical folds were in the cervix (Fig. 1., E and F). The shape and depth of uterine fornix is important at doing

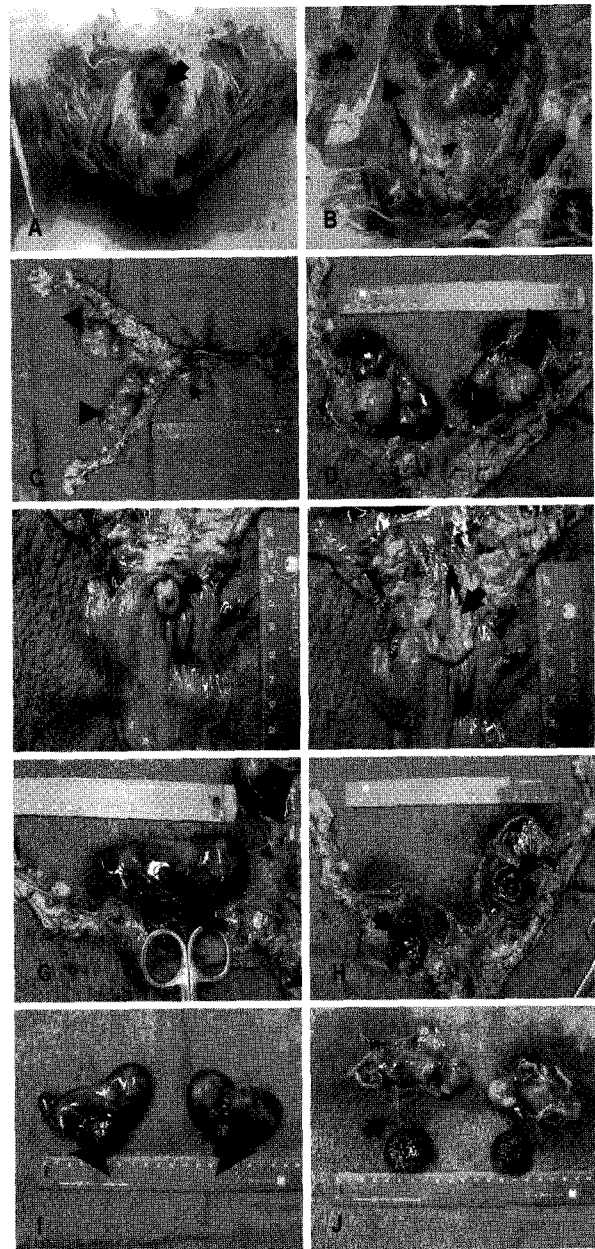


Fig. 1. Appearances of reproductive organs of a pregnant Patagonian mara. (A): An arrowhead indicates tail, thin arrow for anus, and thick arrow for the entrance of vagina. (B, C): Two arrowheads indicate uterine horns in that two fetuses are present. An arrow shows bladder. (D): Two thick arrows show fetuses surrounded by fetal membranes. Two thin arrows show placentas. (E): The entrance of cervix is shown. Fornix is a bit deep. (F): The cervix seems not to have any cervical folds. (G): The arrowheads show chorioallantoic main placentas. (H): Two remaining part on the uterine walls after removing fetuses along with fetal placenta. (I): Two fetuses are shown with fetal membranes and placentas. (J): The arrow shows an umbilical cord.

artificial insemination of goats and sheep (Kershaw et al., 2005). Even when trying to breed maras artificially, the shape of cervix entrance and the depth of uterine fornix could be critical to succeed. The disk-shaped placenta is called as discoidal placenta that is formed by chorion frondosum of fetal placenta's chorion (Fig. 1., G). The maternal placentas were so firmly attached with fetal placentas that were detached with hemorrhage. The fetal and maternal barrier is hemomonochorial as in all caviomorphs (Fig. 1., H). Fetal portion of placenta is composed of a specialized subplacenta and a chorioallantoic main placenta in which labyrinthine lobes are present (Fig. 1., I and J).

To my knowledge, this report is the first about Patagonian mara's reproductive system in Korea.

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