Case Report

A CASE REPORT ON RARE PRESENTATION OF MULTIPLE UTERINE TORSIONS IN A WISTAR ALBINO RAT

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ABSTRACT

Uterine torsion is twisting of uterus or its horn perpendicular to its long axis. This is a case report of uterine torsion in an adult Wistar Albino breeder. The rat was in advanced stage of gestation with no overt signs of illness. The rat was found dead with distended abdomen and four dead pups beside her in her cage. On post mortem examination, 270º uterine torsion was observed in left uterine horn in between the two dead foetuses present and there was a 360º torsion between the caudal foetus and the cervix. One dead fetus was observed in right uterine horn. Uterine torsion in this case was attributed to the foetus-maternal disproportion. Occlusion of uterine blood vessels leads to extensive uterine damage and consequent sequestration of blood to uterus might have resulted in hypovolemic shock and death of the rat. Being a rare condition in rats, uterine torsion should always be considered as a complication in parturition.

Keywords: Foetus-maternal disproportion, Uterine torsion, Wistar rat

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Complications of gestation include pyometra, dystocia, uterine/vaginal prolapse and uterine torsion (Biddle and Macintire, 2000). Uterine torsion is defined as twisting of the uterus or uterine horn perpendicular to its long axis (Dogan *et al*., 2018). Uterine torsion is commonly observed in cattle and is mostly associated with advanced pregnancy and parturition. It is also recorded in almost all domestic animals and in laboratory animals like rabbits and guinea pigs (Ghuman, 2010). In cows and mares, uterine torsion occurs during the first stage of labour, but it is reported to be a complication of mid to late gestation in other domestic species (Roberts, 1986). Only few experimental studies have been conducted to study uterine torsion in rats. Not much data is available about the incidence of uterine torsion in rats except a case of 270º torsion of the right uterine horn of the uterus in a Sprague Dawley rat reported by Erlwanger *et al*. (2011).

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We present this report of multiple uterine torsions in a Wistar Albino rat recorded in our Laboratory Animal Unit. Our Laboratory Animal Unit, is monitored by Institutional Animal Ethical Committee of Tamil Nadu Veterinary and Animal Sciences University, Chennai -51, under the control of Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Fisheries, Animal Husbandry and Dairying Department of Animal Husbandry and Dairying Government of India. In this unit, Wistar Albino rat strain is bred for research purpose. Trio-mating is being followed in the unit with the ratio of one male to two female rats. In this breeding unit, pregnant female at 18 - 20 days of gestation, is housed individually in a cage with corncob as bedding material and shredded paper as environment enrichment. The bedding material is changed twice in a week. A female Wistar Albino rat in breeding unit was found dead with distended abdomen and four dead pups beside it in her cage during routine monitoring. The rat was full term pregnant and no signs of illness were noticed during previous day evening observation.

The rat was housed in a conventional cage and standard environmental conditions like temperature of 21 - 23°C, relative humidity of 45 - 55 per cent was maintained. 12-hours light (6.00 AM to 6.00 PM) and 12-hours dark cycle (6.00 PM to 6.00 AM) was maintained. She had continuous supply of potable water and *ad libitum* rodent pellet feed.

The rat was presented for post mortem examination next day morning, it was found that the bedding was blood-stained with four dead pups and the vagina was also stained with blood. All these indicated that she was in the process of parturition. The rat was in good body condition but was cold on touch. On opening the abdomen, one dead foetus was present in the right horn of the uterus and two dead foetuses were present in the left horn of the uterus. 270 degree uterine torsion was observed in left uterine horn in between the two foetuses present and there was a 360 degree torsion between the caudal foetus and the cervix (Fig. 1). In the left horn because of torsion of uterus, cephalad foetus was observed to have been pulled backward whereas the caudal foetus was pulled in the forward direction (Fig. 2). The length of the foetus (from the tip of the external nares to the base of the tail) in the right horn was 57 mm and cephalad foetus in the left horn was 68 mm and caudal one was 64 mm. Liver showed mild diffuse pale degenerative areas on all lobes. No gross abnormalities were detected in lungs, pancreas, spleen and kidneys. Macerated brownish red foetal contents were observed in her stomach.

In breeding units, laboratory rodents are bred and utilised mostly in research because of their attributes like short estrous cycle, short gestation period and large litter size. Despite of these attributes, the uterine torsion is expected to occur commonly in rodents. In contrary to that, uterine torsion is rarely encountered in rats whereas it is commonly observed in bovine. Uterine torsion is highly associated with advanced pregnancy and process of parturition in bovine. It is observed more commonly in multiparous animals than in primiparous animals due to stretching of the broad ligament in previous

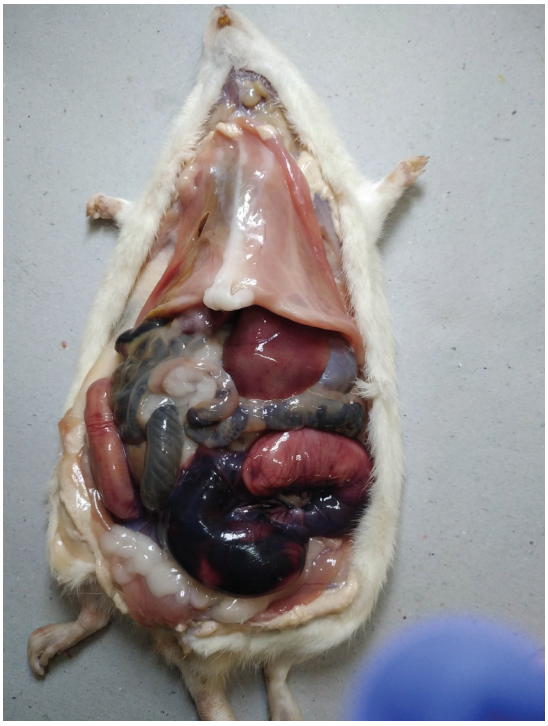

Fig. 1. Torsion of left horn of uterus. Two foetuses in the left horn and one foetus in the right horn. Serosanguineous fluid was observed around the foetus

Fig. 2. After correction of the torsion. Position of foetuses in the left horn changed and upheld to normal. Manifestation of sequestered blood in the uterus and uterine blood vessels

pregnancies, which is a predisposing factor for the condition (Ghuman, 2010).

In the present case, the rodent was in second parity with previous litter size of 13numbers. The average length of the foetus for this litter was 62 mm including 4 foetuses born and died and 3 dead foetuses inside (length of the foetuses recorded respectively as 57 mm, 58 mm, 60 mm, 62 mm, 64 mm, 68 mm and 63 mm). As the litter size (8) is smaller, this could have resulted in more *in utero* nutrition of the foetuses. The foetuses in the left horn with length of 64 and 68 mm are lengthier than average length. Larger and lengthier foetuses may have resulted in foetus-maternal disproportion which might have resulted in dystocia (Erlwanger *et al*., 2011). Disproportion in the foetal and maternal sizes has been depicted as a cause of uterine torsion in a cat (Misumi *et al*., 2000). At the time of parturition, average sized calf will be able to flex its limbs and rotate within the uterus whereas the oversized calf may get entangled with persistent foetal movements resulting in uterine torsion (Ghuman, 2010). Noakes *et al*. (2001) reported that uterine instability may induce torsion only up to 180^{o}, whereas torsions of ≥360^{o} require active foetal movements. Hence, in this case torsion would have occurred due to active foetal movements. In general, contractions occur cephalad to the most caudal foetus during parturition. Therefore, torsion would have occurred first between the caudal foetus and the cervix, then between the two foetuses. Clinical signs and prognosis of the case is determined mainly by the degree of torsion which varies from 180^{o} to 900^{o} (Thilagar *et al*., 2005).

Ghuman (2010) reported that the body frame of dam is also a factor responsible for uterine torsion in pregnant animal. Capacious and pendulous abdomen facilitates easy rotation of pregnant uterus in multiparous animal than in primiparous animal. Smooth parturition ensures normal maternal behaviour whereas any interruption may affect the maternal behaviour. In this case the animal's behaviour was affected due to uterine torsion resulting in cannibalism of a pup which is evident by the stomach contents of the rat. Torsion of uterus occludes the uterine blood vessels and leads to extensive uterine damage. Engorgement of uterine blood vessels and sequestration of blood in the uterus may have resulted in hypovolemic shock and death of the rat which was substantiated by the cold body surface

Even though uterine torsion is a rare condition in rats, it should also be considered as one of the complications in parturition. If pregnant animals exhibit any signs of prepartum illness, the animals may be subjected to ovariohysterectomy to retrieve valuable pups (Erlwanger *et al*., 2011). Narver (2012) suggested that minimizing stress and disturbances like cage changing to the animal, supportive fluid therapy, rich energy supplements and thermal support may sometimes be helpful to achieve vaginal delivery by mice that are in good body condition with dilated cervix and with no eventual obstruction due to torsion.

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