International Journal of Livestock Research, Vol. 11 (8) Aug' 2021
http://www.ijlr.org
eISSN: 2277-1964

Original Research

# A New Approach of Per-Cutaneous Abdominal Manipulation for the Correction of Uterine Torsion in Goats

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**How to cite this paper:** Cholakkal, I. K. (2021). A New Approach of Per-cutaneous Abdominal Manipulation for the Correction of Uterine Torsion in Small Ruminants. *International Journal of Livestock Research*, 11(8), 23-27. https://dx.doi.org/10.5455/ijlr.20210409125826

**Received** : May 03, 2021
**Accepted** : Jun 18, 2021
**Published** : Aug 31, 2021



## Abstract

*Uterine torsion is one of the major causes of dystocia in small ruminants. Instead of the usual method of rolling the animal, a novel method of abdominal manipulation was attempted for correction of uterine torsion in goats. After assessing the position and direction of torsion, hindquarters of the animals were lifted by an attendant. Palpation of the gravid uterus through the ventral abdomen was attempted keeping both hands outside or one hand inserted per vaginum and de-torsion was tried. Favourable response was indicated by the emerging order of uterine contents and accessibility of foetus per vaginum. Dystocia could be corrected in all the four goats attended thereby. Lifting the hindquarters moves abdominal organs forward so that gravid uterus hangs freely making per-cutaneous de-torsion easier. It is concluded that per-cutaneous manipulation together with lifting the hindquarters forms an easier approach for the correction of uterine torsion in goats.*

**Keywords:** Goat, Dystocia, Torsion, Uterus, Per-cutaneous Technique

## Introduction

Dystocia caused by uterine torsion is one of the major indications for cesarean section in small ruminants (Phillip *et al.,* 1985). Goats with single fetus pregnancies are more prone to suffer a varying degree of uterine torsion than those with multiple fetuses (Roberts, 2002; Kumar *et al.,* 2020). Additionally, the torsion encountered is mostly post-cervical rather than pre-cervical (Purohit, 2014). A clear distinction of the location and direction of torsion has to be made by careful vaginal examination using techniques such as digital palpation, speculum examination, observing the orientation of vulval lips (Roberts, 2002; Biswal *et al.,* 2015), and per-rectal digital palpation/bimanual palpation (Kutty, 1999) of the cervix for positional deviations. Once the location, direction, and degree of torsion are assessed, the usual approach for its correction is by rolling the animal on the floor (Yadav *et al.,* 2018) with or without the application of external pressure onto the abdomen (Yadav *et al.,* 2018; Abrol *et al.,* 2020). Schaeffer's method of correction, using a wooden plank or pipe of adequate dimensions, and its modifications are reported with reasonable success (Biswal *et al.,* 2015; Hussain *et al.,* 2015; Kumar *et al.,* 2020). In this approach, the pressure instilled by the external object is expected to fix the gravid uterus stationary while the animal is being rolled. The major drawback of the approach includes exhaustion (Abrol *et al.,* 2020) caused by rolling and the extreme elevation of intra-abdominal pressure. The stress of repeated rolling with distended abdomen also affects the success rate of the ensuing cesarean section, which is the ultimate option (Dhindsa *et al.,* 2005).

Restraining of sheep and goats in dorsal recumbency with the hindquarters kept elevated for around 20 min, forms the usual practice for increasing the space within the posterior abdomen during laparoscopic insemination, with no untoward consequences (Milovanovic *et al.,* 2013; Sathe, 2018). In case of full-term pregnant goats, lifting the hindquarters as in laparoscpic insemination animals creates distress and difficulty of lifting and manipulation due to the increased weight of gravid uterus. However, the possibility of partial elevation of the hindquarters to reduce the pressure of abdominal organs onto the gravid uterus was thought of to make the de-torsion procedure easier through abdominal manipulation. Thus, the objective of the present investigation was to assess the usefulness of per-cutaneous manipulation facilitated by lifting the hindquarters for correcting dystocia caused by uterine torsion in goats.

## Materials and Methods

The study was carried out at Teaching Veterinary Clinical Complex, Pookode and some private farms, on four goats diagnosed to have dystocia due to uterine torsion. All the goats were presented with signs of labor that did not progress to delivery even after many hours of onset. Uterine torsion as the basic cause for dystocia was confirmed through history, external signs, and clinical examination including digital palpation per-vaginum, speculum examination, and bi-manual palpation (Kutty, 1999), which also enabled assessment of the location and direction of the torsion and severity of the condition. The goats were restrained in a standing position holding their neck between the legs of an assistant, who stood in such a way as to enable lifting of the hindquarters. The hindquarters was lifted to position the body at about 45 to 60$^{o}$ angle by holding the skin flaps adjoining the stifle joints on either side (Figure 1).

**Figure 1:** Goat positioned with the hindquarters lifted for per-cutaneous abdominal manipulation

For the correction of torsion, the examiner would attempt to grasp the fetal prominences using both hands after palpating the gravid uterus through the right ventral abdomen and would try to rotate the uterus in the opposite direction of torsion. A favorable response was indicated by the change in position of the fetal extremity in the desired direction. De-torsion was confirmed by per vaginal examination after placing the hind legs of the dam back to normal. A characteristic odor from the birth canal and accessibility of the cervix, water bags, and /or fetal extremities were the other indications for the progress of de-torsion. Correction attempts were repeated in two to three spells until the achievement of satisfactory de-torsion.

In the case of larger goats, in which per vaginal hand insertion was possible, palpation of the cervix was attempted to assess the degree of de-torsion. Further attempts for de-torsion in such animals were carried out by inserting the left hand per vaginum together with percutaneous manipulation in the elevated position using the right hand. Widening of the birth canal together with the straightening of the cervix formed indications of the de-torsion concurring the report of Abrol *et al.* (2020). After the assessment of de-torsion, the animals were allowed to rest for 20-30 min so that uterine contraction and straining resumed and further relaxation of the cervix occurred. After a reasonable waiting period, the progress towards expulsion of the fetus was assessed and forced extraction was attempted to deliver the fetus.

## Results and Discussion

In all the four goats, correction of the dystocia could be achieved through per-cutaneous abdominal manipulation without much difficulty. All the goats in the study were carrying a single fetus. It is already established that imbalance of the uterus in single pregnancies predisposes to uterine torsion (Roberts, 2002). The location of torsion was pre-cervical in one of the goats and the rest were post-cervical, which was in agreement with the report of Saraswat *et al*. (2015).

The direction of torsion was towards the right side in three of the goats. Pre-cervical torsion and its direction diagnosed in one of the goats was based on, (1) right ward deviation of the cervical opening upon speculum examination with the hindquarters lifted up and was further confirmed to be right ward torsion (2) through per vaginal palpation that was possible in that goat, where in a right ward twist of cervical canal could be detected upon attempting insertion of the index finger. Also, the degree of torsion appeared to be more than 90 degrees in all the four goats based on the tight closure of cervical canal without access to foetus. Similar observations on the direction and severity of torsion in goats were reported by Biswal *et al.* (2015); Saraswat *et al.* (2015) and Abrol *et al.* (2020). Two or three correction attempts were required in achieving adequate de-torsion. The bimanual approach was found to be very effective in achieving de-torsion facilitated by per-cutaneous abdominal manipulation with proper judgments regarding position, direction, strength and, timing of applying the external force. Even though the goat diagnosed as having pre-cervical torsion was primipara, a large vaginal passage permitted hand insertion, making the de-torsion comparatively easier through initial abdominal manipulation followed by the bi-manual approach with raised hindquarters. Supportive medications like fluid therapy, parentral calcium (Calcium borogluconate) and ecbolics were given to all the four goats during the waiting period. There was adequate progress towards expulsion within 20 - 40 min. But in one of the goats, the waiting time for manipulative delivery extended more than one hour. A live kid was delivered from the goat affected with pre cervical torsion and in the rest of the cases, fetuses were dead attributable to delayed attention/diagnosis of the case. In one case, the fetus was found partly decayed emitting foul odor upon de-torsion. Fetal membranes were manually removed from two goats, while normal expulsion occurred in others within a period of 3-6 h.

Even in the goat with putrefied uterine contents and detached foetal membranes, presented after 24 hours of detecting dystocia, the time delay was not much to expect uterine adhesions and de-torsion was not difficult as well. Other cases were not much delayed, indicated by live foetus in one and non-separation of placenta for few more hours after delivering the foetus. Systemic antibiotics and analgesics were administered for 5 days and all the goats had an uneventful recovery.

The major benefit of the percutaneous de-torsion method is that extreme stress, produced by the process of rolling the animals (Dhindsa *et al.,* 2005), for the correction of torsion, can be avoided. Further, the ultimate option of cesarean section and its associated expenses, time, effort, complications and post-surgical risks on the life and fertility of the goats can be reduced (Phillip *et al.*, 1985) by this simple technique of physical manipulation. Even if a cesarean section is necessitated after attempting percutaneous abdominal manipulation, the exhaustion to the

animal is minimal, leaving more chances of success compared to unsuccessful attempts of rolling. Per-cutaneous abdominal manipulation for de-torsion of the gravid uterus requires a basic practice of abdominal palpation in goats (Arthur *et al.,* 2001) and necessitates varying levels of physical exertion by the examiner. However, the manipulation appears to be less troublesome for goats compared to Schaeffer's technique for de-torsion (Kumar *et al.,* 2020). Repeated rolling of the goat with distended abdomen across dorsal recumbency is highly exhaustive (Saraswat *et al*., 2015). Again, besides increased abdominal pressure of full-term pregnancy, the additional external force applied via the plank as suggested by Schaeffer's technique (Dhindsa *et al.,* 2005; Abrol *et al.,* 2020) may aggravate the stress situation further.

Even though lifting the hindquarter of a full-term pregnant doe causes distress, the lifting is restricted to 45-60 degrees, to minimize the difficulty of breathing associated with anterior displacement of visceral organs and the per-cutaneous manipulations. Further, increased stretching of the abdominal wall by upright lifting, creating difficulties for examination and manipulation could be reduced by slanted position. The hindquarter of the animal is lifted by holding the skin flaps cranial to the stifle joint so that the direct stretching of the abdomen is avoided. The forward displacement of abdominal organs produces more space facilitating easier de-torsion through per-cutaneous manipulation of the uterus. The pressure on the uterus due to abdominal organs in the ventral recumbency that hinders uterus manipulation is one of the drawbacks of the rolling method. Whereas the elevated position of hindquarters in the per-cutaneous method makes the de-torsion process easier by per-cutaneous manipulation. The palpation of fetal extremities facilitates the assessment of the progress of de-torsion in the per-cutaneous method. Lack of progress after repeated attempts for correction can be due to the incorrect assessment of the direction of torsion.

## Conclusion

Per-cutaneous abdominal manipulation together with lifting of the hindquarters forms a promising technique for correction of uterine torsion in goats especially considering the easiness of the operation and animal welfare aspects.

## Acknowledgment

The author is highly thankful to Dr. Hiron M. Harshan, Dr. Abdul Azeez C. P. Dr. Leeba Chacko, and other faculties of Teaching Veterinary Clinical Complex, Pookode, and the animal owners for allowing to demonstrate the technique.

## Conflict of Interests

There is no conflict of interest.

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