

*Review Article*

**UNRAVELING THE MYSTERY OF UTERINE TORSION IN BOVINES:  
A REVIEW**

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**Abstract:** Torsion of uterus is a common form of maternal dystocia in bovines encountered mostly in buffaloes by obstetrician in referral hospitals and Veterinary Polyclinics. Various factors predisposing the torsion of uterus that includes maternal and fetal associated factors. Predisposition factors can be logically interpreted with possible existing correlation. The present review explained about various fatal and maternal associated factors with regards to predisposition of torsion of uterus and thus help to decide about the institution of various measures that will prevent the occurrence of torsion in future. At the end, author(s) personal observation at various calving seasons was discussed.

**Keywords:** Bovine, Calving season, Dystocia, Predisposition, Uterine torsion.

## INTRODUCTION

Torsion of the uterus occurs in a gravid uterine horn and is defined as the rotation or twisting of the gravid uterus on its longitudinal axis (Roberts, 2004; Purohit et al., 2011). The common cause of dystocia in buffaloes concern uterine torsion cases in buffaloes are upto 67-83% of the dystocia presented at referral clinical units (Prabhakar et al., 1994; Srinivas et al., 2007). Uterine torsion occurs during last trimester of pregnancy (Murthy et al., 1999), second stage of labour at parturition (Prasad et al., 2000), rarely post-partum (Mathijssen and Putker, 1989) is one of the important maternal cause of dystocia in buffaloes lead to death of calf and increases the dam culling rate. As per incidence concern uterine torsion is higher in buffaloes; even though most reported data arrived from clinical records and not from existent calvings at organised farms.

A retrospective data analysis (2011-2018) of various university farms at coastal Andhra Pradesh and Tamilnadu, revealed no incidence at all in calvings of Murrah, Graded Murrah

and Ongole cows. Similarly, Annadurai dairy farm at villupuram revealed no incidence of torsion of uterus (2000-2010). The exact predisposition factor for torsion of uterus in buffaloes are poorly understood. Here we analyse the predisposition factor which favours the prevention of future occurrence of torsion of the uterus in either same animal or other animal in field condition.

## **PREDISPOSITION FACTORS FOR TORSION OF UTERUS**

A number of concepts available for explaining the causes (or) precipitating factor for torsion of bovine uterus. However, the maternal and fetal related factors behind the incidence of uterine torsion are not clearly understood (Schonfelder and sobiraj, 2005). Taylor, (1942) opined that torsion of uterus is hypothesized to be mostly fetal origin instead of maternal origin as the torsion affected animal is not succumb to torsion in the future gestation. Recently Ghuman, (2010) hypothesized that torsion originated from both maternal and fetal factor with logical interpretation.

### **I. Maternal related factors:**

*1. Anatomy of the broad ligaments orientation:* The two folds of peritoneum hold the uterus in position called mesometrium which is the part of broad ligament. Bovine uterus attached by broad ligament dorso-laterally whereas in mare it is attached dorsally which causes less frequency of torsion of uterus in equine species (Chaney et al., 2007).

Between bovine species also the attachment of broad ligament varies. Aubry et al., (2008) opined that European breeds (*Bos taurus*) and cross breed cattle and buffaloes were more prone to torsion of uterus when compared to Zebu cattle (*Bos indicus*). The reason behind that likelihood of anatomy of arrangements of broad ligaments that may be broad ligament attached dorsal side usually anterior two-thirds of uterus and ventrolateral side usually posterior one-third of uterus in zebu cattle (Sloss and Dufty, 1980) in contrary with only ventro-lateral side of the uterus in European cattle and buffaloes (Noakes et al., 2001).

Additional reports regarding incidence of torsion of uterus more common in buffaloes than cattle is due to presence of big length of broad ligaments; Moreover that ligaments position the gravid uterus at time of calving to facilitate the expulsion of fetus (Singh, 1991). At the same time broad ligaments were thin and have less musculature in torsion affected buffaloes when compared to other type of dystocia (Singh, 1991). Brar et al., (2008) recorded that histology and histo-chemistry of broad ligaments of bovines in which at least 25% of female calf born to torsion of uterus affected dams and probably 11% of non-pregnant buffaloes have very poorly developed musculature of broad ligaments.

**2. Uterine horn location:** Normally the pregnant or gravid horn located inside the supraomentalis recess (Schonfelder and sobiraj, 2005) whenever extension of the gravid uterus outside the supraomentalis recess lead to loss of stability culminate torsion of the uterus (Schonfelder and sobiraj, 2005). Additionally Pearson, (1971) opined that extension of gravid horn ventrally without broad ligament support on tip of horn culminate rotation of the uterus on the gravid horn sides. It could be contrary with Gloor (1973) reports in which 80% of the rotation of uterus on non-pregnant side of horn. However, Dhaliwal et al., 1989 opined that in case of uterine didelphic condition (paired uterine structure) gravid horn only involved in the side of the torsion without involvement of rudimentary uterine horn.

**3. Collapsed Rumen condition:** Rumen acts as a barrier structure for gravid uterine horn to prevent torsion of uterus towards left side; this is the fact for right side torsion of uterus is common in bovines (Siddquee, 1988). However, cattle and buffaloes reared under concentrate diet than pasture land culminate to reduced size of rumen (collapse of rumen), predisposes to increase the space for occurrence of torsion of uterus (Manning et al., 1982).

**4. Parity of the dam:** Age and parity of the dam still act as controversial. There is no age barrier for torsion of uterus, in that affected buffaloes and cattle were had 2-18 years age (Tamm, 1997). Srinivas et al., (2007) opined that the chance of occurrence of uterine torsion in pleuriparous buffaloes about 70-77% torsion whereas 23-30% in primiparous buffaloes. Roomy abdomen, loose and long mesometrium of broad ligaments followed by capacious abdomen and decreased uterine tone increase with age in bovines (Aubry et al., 2008). Roomy and capacious abdomen predisposes the buffaloes to recurrence of torsion after detorsion in the same calving (Thangamani et al., 2017); However pendulous abdomen facilitate the detorsion of the recurrent torsion cases with successful (Thangamani et al., 2017).

**5. System of housing:** Stall fed animal without physical exercise weaken the abdominal muscle culminate torsion of uterus (Agarwall, 1987; Sloss and Dufty, 1980). It is contrary with farm animal maintained in the rural and university farm never encounter the torsion of the uterus since more than 2 calving seasons. Moreover, group of animal in the stall fed condition prone to high risk of torsion due to the chance of being fighting (or) bumped on its side by the closely tied cattle and buffaloes (Aubry et al., 2008).

**6. Accidental movement of Dam:** During advanced pregnancy probability of uterine torsion is more following accidental falling, push from neighbour animal and fight followed by bumpy movements while transportation (Moore and Richardson, 1995). Drost, (2007)

compares behaviour of the bovines to the predisposition of torsion of uterus; Bovines go down on forelimbs while lying down and hind limbs are elevated first while getting up, thus behaviour culminate torsion of uterus at last trimester of pregnancy. Farm maintained buffaloes and cattle also have same behaviour, but never observed torsion of uterus in these animals.

**6. Serum hormonal profiles:** At the time of parturition reduced levels of progesterone followed by increased levels of estrogen concentration in serum is normal phenomenon, that is essential for contraction of uterus at the time of parturition whereas in immediate pre-term concerned high level of progesterone and low levels of estrogen contribute to quiescent or flaccid nature of uterus culminate torsion of uterus (Amer and Hashem, 2008).

## **II. Fetal Associated Factors:**

**1. Sex and weight of calf:** Excessive calf weight is a common precipitating factor for the occurrence of torsion of uterus, gets assist from the records that 90% of bovines with uterine torsion from that harvested calves which have birth weight above the normal breed average birth weight (Frazer et al., 1996). Pattabiraman et al., (1979) recorded that 63-69% calves harvested from torsion of uterus were male calves where as Vasistha, (1983) recorded 55-66% calves were female. Recently Thangamani et al., (2017) reported that recurrence of uterine torsion due to male fetus which have birth weight above the normal breed average weight.

**2. Presentation of Fetus:** Presentation of fetus no way correlated with torsion of uterus. Mostly 80-100% calves from torsion affected animals delivered in anterior presentation with dorso-ilial and dorso-pubic position (Drost, 2007); rarely recorded uterine torsion with posterior presentation.

**3. Quantity of Amniotic fluid:** Normally appropriate quantity of amniotic fluid present in amniotic cavity which act as gushing media for normal fetal movement. Reduction in level of amniotic fluid leads to decreases in distance between fetal and uterine wall (Uray, 1956). Foetal feels the abnormal movement of dam as a stressful trigger and in response, fetus performs vigorous reflexive movements which culminate torsion of uterus (Schonfelder and Sobiraj, 2005). At the same time it decreases the uterine size lead to free movement of gravid uterus prone for twisting.

**4. Fetal Anomalies:** No reports regarding fetal anomalies with torsion of uterus. Recently Maninderjeet Singh et al., (2018) reported torsion of the pregnant uterus with ascitic fetus in

a murrah buffalo; however in this case torsion may be due to increases in fetal weight with ascitic fluid accumulation.

**5. Fetal movement with uterine tone:** Noakes et al., (2001) opine that about 90% torsion of uterus are recorded during the late first stage or early second stage of labour. That correlate with the strong uterine tone with fetal movement prone for uterine torsion. Most probably uterine instability culminate only upto 90-180°, whereas torsion of uterus more than 360° occur when active fetal movements (Noakes et al., 2001) .

#### **AUTHOR(S) OBSERVATION**

Author(s) observed and recorded torsion of uterus at Veterinary Polyclinic (VPC), field level and Obstetrical unit at various calving seasons with various history from farmers in relation to etiological factors of uterine torsion in European breed ( Holstein Friesian), Cross breed cattle ( HF cross and Jersey cross), Native breed cattle (Ongole, Sahiwal) and Graded Murrah buffaloes. No history of wallowing, road traffic accident, fall down from shed in clinically presented cases. Utmost cases completed term. No case was referred from hilly area in and around Polyclinic and coastal Andhrapredesh (AP) and Tamilnadu (TN). Most of the referral cases have passed 2 days to 10 days old. Most probably right side (Clock-wise) , post cervical with 180 to 270 degree torsion was observed. Foetal description concerned mostly anterior longitudinal presentation, dorso-ilial to dorso-pubic position with neck flexion and bilateral carpal flexion.

Regarding sex of the fetus concerns male and female fetus were equally contributed, moreover male fetus was mostly harvested in peak calving seasons. Weight of the fetus concerned at term completed cases more or less 26-28 kg, whereas pre-term delivered cases weight was approximately 20-25 kg. Only one case with recurrent of torsion was observed. Torsion of uterus with bloat and adhesion formed cases were disposed for slaughter without treatment.

#### **CONCLUSION**

Based on the published data and clinically observed cases, it appears that torsion of the uterus in bovines is common; however in buffaloes is the largest single cause dystocia. The precipitating factor for torsion of uterus may suggestive of *abrupt fetal movements, relatively more birth weight of the fetus followed by decreased amniotic fluids*. For maternal factor concerns *inherent weaker broad ligaments*. Reports regarding torsion of uterus in farm maintained cattle and buffaloes were normally had low in incidence, even though they are present in stall fed condition. That may be due to maintains the animal in a balanced ration

diet during advanced stage of gestation followed by special care at last month of gestation. present review concluded that utmost fetal associated factors were act as precipitating factor for torsion of uterus in bovines.

## REFERENCES

- [1] Agrawal, R.G. (1987). 'Some studies in uterine torsion with special reference to its etiology and treatment in buffaloes.' Dissertation, Punjab Agriculture University Ludhiana.
- [2] Amer, H.A. and Hashem, M.A. (2008). Relationship between clinical and biochemical picture of uterine torsion in Egyptian buffaloes (*Bubalus bubalis*). *The Internet Journal of Veterinary Medicine* 4: 1.
- [3] Aubry, P., Warnick, L.D., DesCôteaux, L. and Bouchard, E. (2008). A study of 55 field cases of uterine torsion in dairy cattle. *Canadian Veterinary Journal* 49: 366–72.
- [4] Brar, P.S., Saigal, R.P., Sharma, R.D. and Nanda, A.S. (2008). Histology and histochemistry of broad ligaments in buffaloes. *Indian Journal of Animal Sciences* 78: 464–67.
- [5] Chaney, K.P., Holcombe, S.J., LeBlanc, M.L., Hauptman, J.G., Embertson, R.M., Eric Mueller, P.O. and Beard, W.L. (2007). The effect of uterine torsion on mare and foal survival: A retrospective study 1985–2005. *Equine Veterinary Journal* 39: 33–36.
- [6] Dhaliwal, G.S., Prabhakar, S. and Sharma, R.D. (1989). A note on recurrence of uterine torsion in a cow with didelphic uterus. *Indian Journal of Animal Reproduction* 10: 171–72.
- [7] Drost, M. (2007). Complications during gestation in the cow. *Theriogenology* 68: 487–91
- [8] Frazer, G., Perkins, N. and Constable, P. (1996). Bovine uterine torsion: 164 hospital referral cases. *Theriogenology* 46: 739–58.
- [9] Ghuman, S.P.S. (2010). Uterine torsion in bovines: a review. *Indian Journal of Animal Sciences* 80(4): 289-305.
- [10] Gloor, H. (1973). Etiology of uterine torsion in the cow. *Schweizer Archiv für Tierheilkunde* 115: 74–80.
- [11] Maninderjeet, S.S., Mohinderpal, S., Mandeep, S. and Ajeet Kumar. (2018). Torsion of the pregnant uteus with ascitic fetus in a Murrah Buffalo: A case report. *Indian Vet. J.*, 95(01): 73-74.
- [12] Manning, J., Marsh, P., Marshall, F. and McCorkell, R. (1982). Bovine uterine torsion: a review illustrated by cases from the Western College of Veterinary Medicine, Large animal clinic. *Bovine Practice* 17: 94–98.

- [13] Matthijsen, H.F and Putker, P.H. (1989). Postpartum torsion of the right uterus horn in a cow. *Tijdschrift voor diergeneeskunde* 114: 17–19.
- [14] Moore, A.A. and Richardson, G.F. (1995). Uterine torsion and fetal mummification in a cow. *Canadian Veterinary Journal* 36: 705–06.
- [15] Murty. K.K., Prasad, V. and Murty, P.R. (1999). Clinical observations on uterine torsion in buffaloes. *Indian Veterinary Journal* 76: 643–45.
- [16] Noakes, D.E., Parkinson, D.J. and England, G.C.W. (2001). Maternal dystocias. *Arthurs veterinary reproduction and obstetrics*, (Ed.) Noakes D E. Saunders Harcourt, India.
- [17] Pattabiraman, S.R., Singh, J., Rathor, S.S. and Dhablania, D.C. (1979). Non-surgical method of correction of bovine uterine torsion— a clinical analysis. *Indian Veterinary Journal* 56: 424–28.
- [18] Pearson, H. (1971). Uterine Torsion in Cattle: a review of 168 cases. *Veterinary Record* 89: 597–603.
- [19] Prabhakar, S., Singh, P., Nanda, A.S., Sharma, R.D. and Singh, P. (1994). Clinico-obstetrical observations on uterine torsion in bovines. *Indian Veterinary Journal* 71: 822–24.
- [20] Prasad, S., Rohit, K. and Maurya, S.N. (2000). Efficacy of laparohysterotomy and rolling of dam to treat uterine torsion in buffaloes. *Indian Veterinary Journal* 77: 784–86.
- [21] Purohit, G.N., Y. Barolia, C. Shekher and P. Kumar. (2011). Maternal Dystocia in cows and buffaloes: A review. *Open J. Anim. Sci.*, 1(2): 41-53.
- [22] Roberts, S.J. (2004). Diagnosis and treatment of the various types of dystocia. *Veterinary Obstetrics and Genital Diseases (Theriogenology)*. Woodstock, Edwards Brothers Inc.
- [23] Schönfelder, A. and Sobiraj, A. (2005). Etiology of torsio uteri in cattle—a review. *Schweizer Archiv für Tierheilkunde* 147: 397– 402.
- [24] Siddiquee, G.M., (1988). ‘Studies on etiopathology and therapeutics of uterine torsion in buffaloes.’ Thesis, Punjab Agriculture University, Ludhiana, India.
- [25] Singh, P. (1991). ‘Studies on broad ligament in relation to uterine torsion in buffaloes.’ Thesis, Punjab Agriculture University, Ludhiana, India.
- [26] Sloss, V. and Dufty, J.H. (1980). Obstetrical physiology. Obstetrical pathology. Obstetrical procedures. *Handbook of Bovine Obstetrics*. pp. 39, 105, 108–11, 180–83. (Eds) Sloss V and Dufy J H. Williams and Wilkins, Baltimore.

- [27] Srinivas, M., Sreenu, M., Lakshmi Rani, N., Subramanyam Naidu, K. and Devi Prasad, V. (2007). Studies on dystocia in graded murrah buffaloes: a retrospective study. *Buffalo Bulletin* 26: 40–45.
- [28] Tamm, T. (1997). ‘Studies on bovine uterine torsion.’ Dissertation, Tierärztliche Hochschule Hannover.
- [29] Taylor, W.A. (1942). Torsion of the uterus: with special reference to epidural anaesthesia. *Canadian Journal of Comparative Medicine: Veterinary Science* 6: 102–06.
- [30] Thangamani, A., Chandra Prasad, B., Sriniva, M., Anusha, K., Sadasiva Rao, K. (2017). Recurrence of uterine torsion associated with roomy abdomen and sex of the fetus: A novel case report. *RRJoVST* 6(3): 19-21.
- [31] Uray, H. (1956). The bimanual correction of torsio uteri. *Wiener Tierärztliche Monatsschrift* 43: 610–12.
- [32] Vasishta, N.K. (1983). ‘Torsion of uterus in buffaloes in relation to incidence, etiology and treatment.’ M.V.Sc. Thesis, Punjab Agriculture University, Ludhiana, India.