# **UTERINE TORSION IN BOVINES: A RETROSPECTIVE STUDY**

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## ABSTRACT

A higher risk of uterine torsion in bovine during the late first stage or early second stage is of great concern for the life of fetus, dam and economics of livestock owner. Status of the pregnancy at the 250-260 days in cattle and 295-300 days in buffalo in important prerequisite to avoid parturition complication such as dystocia due to uterine torsion. Present study deals with the referred cases of dystocia diagnosed as torsion in cattle and buffalo (bovines) with the analysis of stage of gestation, parity, type, degree and direction of torsion, method of diagnosis, success rate of correction method, cervical dilatation following detorsion, dam and fetal survivability.

#### Key words: Buffalo, Bovines, Cattle, Uterine torsion.

Uterine torsion refers to rotation of the pregnant uterus on its longitudinal axis (Flemings, 1930; Roberts and Hillman, 1973). Torsion of the uterus may occur in all species of animals but is more prevalent as a cause of maternal dystocia in cattle. The higher incidence of uterine torsion in buffaloes than cattle is partly due to the big length of broad ligaments in buffaloes (Singh, 1991). In Bos indicus cattle, 83 percent and in Bubalus bubalis buffaloes 95-98 percent torsions are towards right side (Prabhakar et al., 1994). About 66-96 percent torsions are post-cervical in which the twist extends caudal to the cervix and involves the anterior vagina in rotation (Noakes et al., 2001). Both duration and the degree of torsion appear to influence calf survivability, while dam survivability is dependent on time elapsed between onset of parturition and correction of torsion (Prabhakar et al., 1994).

The unstable anatomical arrangement predisposes bovines to uterine torsion during the last trimester of pregnancy (Noakes *et al.*, 2001). The pregnancy period is generally complete in 83–85 percent buffaloes affected by torsion (Prabhakar *et al.*, 1994; Srinivas *et al.*, 2007). About 70–77 percent, 23–30 percent and 74 percent torsions occur in the pluriparous, primiparous and during first to third parity in cattle and buffaloes, respectively (Srinivas *et al.* 2007). The direction of post- or pre-cervical torsion is clockwise (right) or counter-clockwise (left) (Noakes *et al.*, 2001). Degree is determined by the number of twists present on the body of uterus (Ghuman, 2010). Following Sharma's modified Schaffer's method, the detorsion rate in Indian buffaloes is around 90 percent (Srinivas *et al.*, 2007).

Cost-utility analysis of a bovine with uterine torsion indicated that total loss of untreated or euthanized animal could be around Rs 30,000–50,000, mainly due to expenses for the replacement of animal, whereas the loss of a treated animal could be around Rs 5,000–10,000 (Ghuman, 2010). This includes losses due to calf, reduced milk yield and handling of subsequent conditions, *viz*. delayed uterine involution, endometritis and infertility (Schönfelder *et al.*, 2003, 2005). The purpose of this analysis was to evaluate referred cases of uterine torsion and their clinical management to compare incidence, diagnostic, type, direction and degree of torsion, treatment method used maternal and fetal outcome/survival.

## **MATERIALS AND METHODS**

The present study reports a total of 83 referred clinical cases of uterine torsion in cattle and buffaloes presented to the Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Udgir, MAFSU, Nagpur, (Maharashtra) during the period of January 2016 to December 2017. All the animals were in advanced pregnancy with the history of anorexia, straining, kicking at belly, lethargy and looking towards hindquarter. Gynaeco-clinical examination of respective animals revealed the diagnosis as uterine torsion. The general gynaeco-clinical parameters like the stage of gestation, parity, type, direction and degree of torsion, method of diagnosis, success rate of correction method, cervical dilatation following detorsion, dam and fetal survivability were studied and analysed. The stage of gestation and parity of animal was based on history provided by owner. Type and direction of torsion was determined by per-vaginal and per-rectal examination on the basis of direction of hand and diagonal stretching of broad ligaments on vagina and direction of spiral folds in vagina. Degree of torsion was assessed by number of twists and tightness of spiral folds present in vagina and body of uterus. Sharma's modified Schaffer's method was used to relieve the torsion.

#### **RESULTS AND DISCUSSION**

The present study accounts a total of 83 (28 cattle and 55 buffaloes) uterine torsion cases during the period of January 2016 to December 2017. The incidence of uterine torsion was higher in buffaloes 55 (66.26%) as compared to cattle 23 (33.73%) (Table 1). In the present study, a high incidence of uterine torsion was recorded in pluriparous 64 (77.10%) (22 cattle and 42 buffalo) as compared to the primiparous 19 (22.89%) animals (6 cattle and 13 buffalo)

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Table 1:     Incidence of uterine torsion in bovines								
Total number of uterine torsion cases	Number of uterine torsion cases in cattle	Number of uterine torsion cases in buffalo						
83	28 (33.73%)	55 (66.27%)						

Table 3:     Stage of gestation in uterine torsion affected bovines										
Total number of uterine torsion cases	Complete Gestation Period	In- Complete Gestation Period	Cattle Complete Gestation Period	Buffalo Complete Gestation Period	Cattle In- Complete Gestation Period	Buffalo In- Complete Gestation Period				
83	77 (92,77%)	6 (7.23%)	26	51	2	4				

Table 2:     Torsion in primipara and pleuripara bovines											
Total number of uterine torsion cases	Primi- para	Cattle Primi- para	Buffalo Primi- para	Pleuri- para	Cattle Pleuri- para	Buffalo Pleuri- para					
83	19 (22.90%)	6	13	64 (77.10%)	22	42					

Table 4:     Number of male and female foetus delivered										
Total number of uterine torsion cases	Female calf	Male calf	Cattle Female calf	Buffalo Female calf	Cattle male calf	Buffalo male calf				
83	41 (49.40%)	42 (50.60%)	15	26	13	29				

Tab	le 5:		
Details of uterine	torsion	in	bovines

Total	Location of torsion		Degree of torsion		Direction of torsion		Diagnostic method		
of cases	Pre - cervical	Post - cervical	≤90	90- 180	180 - 360	Clock wise	Anti-clock wise	Pervaginal	Pervaginal and perrectal
83	43	40	32	46	05	73	10	40	43
Percent	51.81	48.19	38.55	55.42	6.02	87.95	12.04	48.19	51.81

(Table 2). Bovines with complete gestation period accounted 77(92.77%) and animals with incomplete gestation were 6 (7.22%) (Table 3). There was no evidence of vaginal discharge in 75 percent of cases however; a fetid, sero-sanguinous discharge was noticed in only two cases (2.41%). Fourty cases (48.19%) were diagnosed by vaginal examination alone, whereas in remaining 43 cases (51.81%), both vaginal and transrectal examination was used for confirmation of torsion (Table 5). All pre-cervical torsion cases were confirmed by both vaginal and transrectal examination case and external os-cervix was accessible, though it lacked normal consistency.

The direction, diagnosis, location and degree of torsion in study are presented in Table 5, 6 and 7. The direction of torsion before correction was properly

Table 8:     Survivability of cattle and buffalo dam after correction of torsion											
Total number of utering torsion cases	Total survived	Cattle	Survived	Buffalo	Survived						
83	77 (Dam) (92.77%)	28	26 (92.85%)	55	51 (92.73%)						
83	62 (Fetus) (74.70%)	28	21 (75.00%)	55	41 (74.55%)						

diagnosed in all cases. The proportion of clockwise and anti-clockwise direction of torsion was 73 (87.95) and 10 (12.04), respectively (Table 5). Out of 83 cases, observed clockwise and counter clockwise direction of torsion in cattle (26.50% and 7.22%) (Table 6) and buffaloes (61.44% and 4.81%) (Table 7), respectively. Only five cases (6.02%) had torsion greater than 360° whereas, in half of the cases (55.42%), uterus was rotated between 90° and 180° and the next prevalent severity (38.55%) was  $\leq$  90° (Table 5).

All the cases were successfully detorted by using Sharma's modified Schaffer's method. In three animals that had uterine torsion and successfully corrected by rolling subsequently required caesarean section for fetal removal because of incomplete cervical dilatation. A number of 41 (49.39%) females, out of which 13 and 29 were cattle and buffalo calves and male 42 (50.60%) out of which 15 and 26 were cattle and buffalo calves respectively (Table 4). On a week's review of animals discharged from hospital the survivability was found to be 92.77 percent (77/83) in which 26 cow (92.85%) and 51 buffalo (92.73%) survived (Table 8).

Uterine torsion which is reported as to occur more frequently at the end of gestation has been considered as a single largest cause of dystocia in buffaloes (Srinivas *et al.*, 2007). The most striking aspect of bovine uterine torsion is that they almost invariably occur at term and although the exact cause remains controversial. This is

Table 6:     Details of uterine torsion in cattle										
Total	Location of	of torsion Degree of torsion			Direction of torsion		Diagnostic Method			
of cases	Pre - cervical	Post - cervical	≤ 90	90 - 180	180 - 360	Clock wise	Anti clock wise	Per vaginal	Per vaginal and perrectal	
28	19	09	12	16	00	22	06	09	19	
Percent	67.85	32.14	42.85	57.14	00	78.57	21.4 3	32.14	67.85	

Table 7:   Details of uterine torsion in buffalo												
Total number	Location of torsion		Degree of torsion		Direction of torsion		Diagnostic method					
of cases	Pre - cervical	Post - cervica 1	≤ 90	90 - 180	180 - 360	Clock wise (Right)	Anti clock wise (Left)	Per vaginal	Per vaginal and perrectal			
55	24	31	20	30	5	51	4	31	24			
Percent	43.63	56.3	36.3 6	54.5 4	9.09	92.72	7.27	56.36	43.64			

based on the fact that in most cases a variable degree of cervical dilation will be noted prior to or immediately after detorsion (Nanda and Sharma, 1986). It's simple form (90°-180°) is readily corrected under field conditions (Arthur *et al.*, 1989). Advanced pregnant bovines may get predisposed to uterine torsion following sudden fall, sudden push from other animal and bumpy movements during transportation (Moore and Richardson, 1995). While lying down, bovines go down on forelegs first and while getting up, the hindquarters are elevated first, thus each time, the pregnant uterus is temporarily suspended in the abdominal cavity and is prone to torsion (Drost, 2007).

In the present study, we found maximum number of uterine torsion cases in pleuripara (64;77.10%)(22 cattle and 42 buffalo) as compared to primipara animals (19;22.89%) (6 cattle and 13 buffaloes). The influence of age on occurrence of uterine torsion remains controversial; as there is no age predisposition in torsion-affected buffaloes and cattle of 2–18 years age (Tamm, 1997).

Most frequently, during pre-cervical torsion, the twist of rotated uterus lies on the body of uterus and does not extend beyond the cervix, thus folds on vaginal wall are absent and cervix is approachable during vaginal examination (Noakes *et al.*, 2001). Pre-cervical torsions are more likely to occur during the last trimester (Sloss and Dufty, 1980). In our study, rectal examination was performed, in addition to vaginal examination emphasizing the observation of Frazer *et al.* (1996) stating that presence of uterine torsion should not be ruled out unless transrectal palpation has been performed.

It's crucial that direction of twist is correctly determined prior to attempts at correction as rotation in incorrect direction will worsen problem. In our study, the proportion of clockwise torsion is higher than the counter clockwise. In buffaloes, the absence of a muscular fold on right broad ligament increases the possibility of right torsion (Singh, 1991; Ghuman, 2010). Moreover, capacious and pendulous abdomen seems to facilitate easy rotation of pregnant uterus in buffaloes compared to cattle and in pluriparous buffaloes compared to primiparous buffaloes (Sloss and Dufty 1980, Siddiquee 1988, Singh, 1991). Confinement of animals in stables for long periods may lead to weakness of the abdominal muscles due to lack of exercise and thus may support the occurrence of uterine torsion (Sloss and Dufty, 1980). Degree is determined by the number of twists present on the body of uterus. During rectal examination, these are palpable like the twists on a screw. The higher proportion of torsions between 90° and 180° (55.42%) was obtained in this study. Torsion of >45° may result in dystocia (Sloss and Dufty, 1980) and torsion of 90°-180° is common, but a marked difference exists between referral and field cases of uterine torsion (Pearson, 1971; Frazer et. al., 1996).

Detorsion following Schaffer's method was successful in all attempted cases as against one failure in rolling method. Rolling the cow has been reported to be successful in 34-100 percent of cases (Sloss and Dufty, 1980). Duration of torsion has significant role in likelihood that cervix will completely dilate subsequent to detorsion. Also, uterine contractions induced by live fetus help to achieve complete dilatation of cervix (Ghuman, 2010). Survivability of calves delivered from torsion in this study was 74.70 percent (62/83). Out of the 62 calves survived/born, 21 are cattle calf (75.00%) and 41 are buffalo calf (47.55%). The calf survivability obtained in this study is in agreement to finding that both duration and degree of torsion influence calf survival rate as reported by Prabhakar *et al.* (1994).

Main factor determining survivability of dam is time elapsed between onset of parturition and correction of torsion. Survival rate in torsion affected bovine declines linearly from 87-43 percent with increase in duration of torsion (Prabhakar et al., 1995). In the present study, the survival rate both in cattle and buffalo is 75 per cent which is in accordance with the findings of Kumar (2012) who reported 62.50 percent in fresh dystocia cases not handled by local veterinarian and Singh et al. (2013) who observed 80 per cent survival rate in dystocia cases manipulated by mutation. Furthermore, dam survival rate in pre-cervical torsion is lower than post cervical torsions (Prabhakar et al., 1997). Also, degree of torsion and thus vascular compromise influence development of uterine edema and ischemic necrosis that leads to endotoxic shock (Sloss and Dufty, 1980). Survivability of dams that are first rolled and thereafter subjected to caesarean in 36 and 36-72 hours of occurrence of torsion was 100 and 50 percent, respectively (Srinivas et al., 2007). Upon judicious handling in this study, survivability of dam was 77 (92.77%).

In conclusion, prognosis and future fertility of dam as well as fetal outcome depends on severity and duration of uterine torsion and methods of handling. Diagnosis of condition, particularly pre-cervical torsions is a dilemma for veterinarians. However, judicious diagnosis and timely intervention can reduce calf mortality as well as dam mortality, significantly. As torsion of uterus frequently occurs during parturition, any abnormal sign at the time of parturition requires due attention and rectal examination in addition to vaginal examination becomes mandatory.

### REFERENCES

- Drost, M. (2007). Complications during gestation in the cow. *Theriogenol.* **68**:487-491.
- Fleming, G. (1930). Fleming's Veterinary Obstetrics. Baillière, Tindall and Cox, London. pp. 235-250.
- Frazer, G., Perkins, N. and Constable, P. (1996). Bovine uterine torsion: 164 hospital referral cases. *Theriogenol.* **46**:739–58.
- Ghuman, S. P. S. (2010). Uterine torsion in bovines: a review. *Ind. J. Anim. Sci.* **80(4)**:289-305.
- Kumar, S. (2012). Evaluation of antioxidant status and its modulation in buffalo affected with dystocia. M.V.Sc thesis submitted to Lala Lajpat Rai University of Veterinary and Animal Sciences, Hissar, India.
- Moore, A. A. and Richardson, G. F. (1995). Uterine torsion and fetal mummification in a cow. *Can. Vet. J.* **36**:705–06.
- Nanda, A. S. and Sharma, R. D. (1986). Studies on serum

progesteronelevels in relation to occurrence of uterine torsion in buffaloes (*Bubalus bubalis*). *Theriogenol*. **26**:383–89.

- Noakes, D. E., Parkinson, D. J. and England, G. C. W. (2001). Maternal Dystocia. In: Veterinary reproduction and obstetrics, 8<sup>th</sup> Edn. Saunders Harcourt, India. pp. 230-235.
- Pearson, H. (1971). Uterine torsion in cattle: a review of 168 cases. *Vet. Rec.* **89**: 597–603.
- Prabhakar, S., Singh, P., Nanda, A. S., Sharma, R. D. and Singh, P. (1994). Clinico-obstetrical observations on uterine torsion in bovines. *Indian Vet. J.* 71: 822–824.
- Prabhakar, S., Dhaliwal, G. S., Sharma, R. D. and Nanda, A. S. (1995). Success of treatment in relation to milk letdown and pelvic relaxation in bovines with torsion of uterus. *Indian J. Dai. Sci.* 48: 323–25.
- Prabhakar, S., Dhaliwal, G. S., Sharma, R. D. and Nanda, A. S. (1997). Success of treatment and dam survival in bovines with precervical uterine torsion. *Indian J. Anim. Reprod.* 18: 121–123.
- Roberts, S. J. and Hillman, R. B. (1973). An improved technique for the relief of bovine uterine torsion. *Cornell Vet.* **63**:111–116.
- Schönfelder, A., Richter, A. and Sobiraj, A. (2003). Prognostic indicators for conservatively incorrectable uterine torsion in the cow. *Tierärztliche Umschau*. 58:512–517.
- Schönfelder, A., Richter, A. and Sobiraj, A. (2005). Stages of surgically incorrectable uterine torsion of cows: associations with clinical progress. *Tierärztliche Umschau*. 60:199-205.
- 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. *Buff. Bull.* 26:40–45.
- Siddiquee, G. M. (1988). Studies on etiopathology and therapeutics of uterine torsion in buffaloes. M.V.Sc. thesis submitted to Punjab Agriculture University, Ludhiana, Punjab, India.
- Singh, P. (1991). Studies on broad ligament in relation to uterine torsion in buffaloes. Thesis, Punjab Agriculture University, Ludhiana, India.
- Singh, G., Pandey, A.K., Agnihotri, D., Suresh chander, Chandolia, R. K. and Dutt, R. (2013). Survival and fertility rate in buffaloes following caesarean section and mutation with/without partial fetotomy. *Indian J. Anim. Sci.* 83(3): 251–253.
- Sloss, V. and Dufty, J. H. (1980). Dystocia-displacement of gravid uterus. Obstetrical physiology, Obstetrical pathology and Obstetrical procedures. In: Handbook of Bovine Obstetrics. Baltimore, Maryland.Williams and Wilkins. pp. 39, 105, 108–11, 108–183.
- Tamm, T. (1997). Studies on bovine uterine torsion. Dissertation submitted to Tierärztliche Hochschule Hannover.