

RESEARCH ARTICLE

Incidence of Uterine Torsion and Related Factors in Buffaloes of Amul Milk Shed Area

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ABSTRACT

A study was carried out to find out the retrospective incidence of uterine torsion in buffaloes among obstetrical cases in Amul milk shed area and factors influencing it. Data on 1,13,772 obstetrical cases attended from January 2017 to June 2018 by Amul Veterinarians were collected. Moreover, 50 buffaloes suffering from uterine torsion were taken up during July-December, 2018 to know the side, site, degree of uterine torsion, parity as well as sex and viability of the calf and the dam after detorsion/Caesarean section in the same area. In the retrospective study, a total of 2000 cases of uterine torsion were recorded among total 1,13,772 bovine obstetrical cases, which encompassed 1.76%. Of the 2000 cases, 92.20 (1844) percent torsions were found in buffaloes only. Among 57,111 obstetrical cases attended in buffaloes, the incidence of uterine torsion was 3.23%. Moreover, the region/center-wise incidence of torsion cases varied from 1.30–19.36%. The highest incidence of uterine torsion was found in Anand region (19.36 %) followed by Kathlal (11.23 %) and Mahemdabad (10.14 %) regions, while the lowest incidence was in Virpur (2.06%), Petlad (1.46%) and Piplata (1.30%). It was concluded that buffaloes mostly experience right side (100%), post-cervical (82%) uterine torsion of 270–360° (66%), at full term of gestation (70%) with lower survivability of the calves (30%), however, the survival rate of the dams post-treatment was 90%.

Keywords: Buffaloes, Clockwise, Pluriparous, Post-cervical, Schaffer's method, Uterine torsion.

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INTRODUCTION

In India, buffalo plays a crucial role to supply the requirement of animal protein for millions of people: buffalo supplies milk, meat, leather, bones, pharmaceuticals, dung and manure besides draft energy power (Madan, 2010). The profitability of dairy farms depends greatly on the reproductive efficiency of dairy animals. Pregnancy pathology inflicts heavy economic losses to farmers due to death of fetus, dam, or both, and can impair lactation (Swelum *et al.*, 2012). Obstructive parturition has an immense economic impact. There are numerous causes of obstructive parturition, which have been classified as maternal and fetal or a combination of both. Uterine torsion is one of the most common obstetrical problems encountered in cows and buffaloes. It is reported to occur more frequently at the end of gestation and has been considered as a single largest cause of dystocia in buffaloes (Mishra *et al.*, 2015). Uterine torsion is a common entity in middle Gujarat particularly in buffaloes, but the systematic studies on its incidence, causes and outcome are lacking. Hence, the present study was aimed to investigate the incidence of uterine torsion and factors influencing it in buffaloes among obstetrical cases under the Amul milk shed area of Gujarat.

MATERIALS AND METHODS

The retrospective incidence of uterine torsion was studied using data of 1,13,772 bovine emergency obstetrical services rendered by Vets of Amul Research and Development Association (ARDA), Amul Dairy, Anand over a period of

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one and a half year, i.e., from January 2017 to June 2018. In addition, the information generated of 50 uterine torsion cases in buffaloes actual attended by our team in and around Anand city during last monsoon with the help of Amul Vets and State Animal Husbandry Department was used to know the parity, gestation days, side, site, degree of uterine torsion, sex as well as viability of calf and dam after detorsion/Caesarean section of affected cases.

Diagnosis of uterine torsion was arrived based on the history of the case and by trans-rectal examination followed by trans-vaginal examination to determine the parity and the days of gestation, the degree ($\leq 90^\circ$,

180°, 270°, and $\geq 360^\circ$) and direction (right and left side or clockwise and counter-clockwise) and site (pre- or post-cervical) of torsion. The location of broad ligaments or the twist in the vagina was the basis to determine the degree and direction of uterine torsion (Ghuman, 2010). All the buffaloes with uterine torsion were first treated by Schaffer's method. Maximum four rollings were tried, and if failed to detort, Caesarean section was performed. Viability of calf at birth and survival of dam post-treatment were recorded for each case. The data were analyzed using descriptive statistics.

RESULTS AND DISCUSSION

The break-up of total 1,13,772 bovine obstetrical cases treated by Amul Vets in different regions of Amul milk shed area over the last one and a half year is given in Table 1.

Among total bovine obstetrical emergencies, 2000 cases (1.76%) were of uterine torsion. Out of these 2000 bovine uterine torsion cases, 1844 (92.20 %) cases were found in buffaloes, whereas in cattle the figure was 156 (7.80 %) only, though the total obstetrical cases were almost same in cattle and buffaloes (Table 1). Among 57,111 obstetrical cases attended in buffaloes, the incidence of uterine torsion was 3.23 percent, whereas the incidence of abortion, dystocia, retention of placenta, pre-and post-partum genital prolapse varied from 10.34–40.05 percent, and the cases of fetal mummification and maceration were only 0.04 percent each (Table 1). These data clearly reflect that buffaloes are most vulnerable to uterine torsion compared to cattle in middle Gujarat, though the occurrence of other obstetrical issues was almost similar in both the species. The higher occurrence of the uterine torsion in buffaloes is hypothesized to be because of the deep capacious and pendulous abdomen of the buffalo (Singh, 1995) and inherently weaker muscles and relatively long broad ligaments making the pregnant uterus less stable (Singh, 1991). Moreover, broad ligament musculature is better arranged in cattle compared to buffaloes, thus providing

better stability to the pregnant uterus of cattle (Brar *et al.*, 2008).

The records of buffalo cases analyzed further revealed regional variation in the incidence of uterine torsion from 1.30–19.36%. The highest incidence of uterine torsion cases was found in Anand region (19.36%), followed by Kathlal (11.23%) and Mahemdabad (10.14%) regions, and the lowest incidence was in Virpur (2.06%), Petlad (1.46%) and Piplata (1.30%), while in rest of the regions of middle Gujarat, the incidence of uterine torsion among total cases varied from 3.36 to 9.11%. This observation reflects that buffaloes are more prone to uterine torsion in certain specified regions only which imbibes for management strategies to minimize the occurrence of torsion in high valued dairy animals. Moreover, this regional variation in incidence could be due to variation in number and type of obstetrical emergencies attended in each region/center or referral hospital (Nagaraju, 2018).

In the present study, all the 50 cases of uterine torsion were of the right side, which concurred well with the report of Krishnamurty and Ramakrishna (2014). A preponderance of right side uterine torsion in buffaloes is postulated because of the absence of a muscular fold on right broad ligament in the buffalo (Brar *et al.*, 2008) and the presence of the rumen on the left side.

Among the 50 cases studied, the incidence of postcervical uterine torsion was more frequent (82%) when compared with the pre-cervical torsion (18%) (Table 2). A similar observation was also made by the previous researcher in buffaloes (Purohit *et al.*, 2013; Zaher *et al.*, 2017). The higher incidence of postcervical uterine torsion may be attributed to the absence of the muscles in the cervical area of broad ligaments and lack of broad ligament support posterior to the cervix, which might leave the gravid uterus imbalanced and more prone to rotation (Prabhakar *et al.*, 1997; Jeengar *et al.*, 2015).

Moreover, among 50 buffaloes, 33 (66%) had suffered from 270–360° uterine torsion, 10 buffaloes (20%) with

Table 1: Obstetrical emergencies attended by Amul Vets particularly in buffaloes of Amul milk shed area (January 2017 to June 2018)

Obstetrical condition	Total bovine obstetrical cases	No of cases in buffaloes	Per cent buffaloes affected	Frequency among buffalo affected (%)
Uterine torsion	2,000	1,844	92.20	03.23
Abortion	10,290	5,906	57.40	10.34
Dystocia	16,767	8,814	52.57	15.43
Retention of placenta (ROP)	59,940	22,871	38.15	40.05
Prepartum prolapse	10,130	7,672	75.73	13.43
Postpartum prolapse	14,529	9,958	68.54	17.44
Mummification of the fetus	66	23	34.85	00.04
Maceration of the fetus	50	23	46.00	00.04
Total	1,13,772	57,111	50.20	100.00



Table 2: Incidence of uterine torsion in buffaloes in relation to a different direction, degree, site, stage of gestation, parity, sex of the calf and viability of the calf (n = 50)

No.	Factors associated with uterine torsion		No.	%
1.	Side of uterine torsion	Right side	50	100
		Left side	0	00
2.	Site of uterine torsion	Precervical	9	18
		Postcervical	41	82
3.	Degree of torsion	90–180°	7	14
		180–270°	10	20
		270–360°	33	66
4.	Parity of the animal	Primiparous	14	28
		Pluriparous	36	72
5.	Stage of gestation	Pre term	15	30
		Full term	35	70
6.	Sex of the calf	Male	28	56
		Female	22	44
7.	Viability of the fetus	Dead	35	70
		Live	15	30

180–270° uterine torsion and 7 buffaloes (14%) with 90–180° uterine torsion (Table 2). These observations were in accordance with the reports of Zaher *et al.* (2017) and Nagaraju (2018). The probable reason for greater rotation of the pregnant uterus on its axis appears to be the instability of the uterus as the bubaline amnion fused at many places to the surrounding allantois, which is attached to the uterine wall and the gravid uterus rests on the abdominal floor during mid to late gestation with no stabilizing attachments; hence, rotatory fetal movements during the second stage of labor or late gestation would rotate the uterus. Further, a smaller quantity of fetal fluids and an associated decrease in the size of the uterus at the terminal stage of gestation with lower uterine tone increase the fetal discomfort, which initiates further fetal movements and a greater degree of torsion (Purohit and Gaur, 2014).

In the present investigation, the occurrence of uterine torsion was recorded more common in pluriparous buffaloes (72%), than in the primiparous animals (28%) (Table 2). This finding was in close agreement with the reports of Mane and Bhangre (2015). This may be attributed to the larger abdominal cavity, stretching of pelvic ligaments, loose and long broad ligaments together with the loosening of uterine tissue and decreased uterine tone in old aged bovines (Aubry *et al.*, 2008). Most of the cases of uterine torsion were at full term pregnancy (70%), while 30% cases were observed 5–15 days pre-term (Table 2). This observation was analogous to the studies of Jeengar *et al.* (2015). Higher incidence at full term is generally assigned to the violent movement of the dam, strong uterine contractions and righting reflex of the

fetus during the first and/or second stage of labor causing the failure of delivery (Nagaraju, 2018).

After successful detorsion of 50 cases by different means in the study, 56% of the calves born were male, while rest 44% were female. Moreover, the majority of calves delivered were dead (70%), and only 30% calves were born alive (Table 2). Similar observations were also made earlier by Naik (2016) and Nagaraju (2018). Purohit *et al.* (2013), however, found slightly higher calf mortality. The finding clearly indicated that there was no significant relevance with the sex of calf and the occurrence of uterine torsion. However, Jeengar *et al.* (2014) reported the birth of a higher proportion of male calves and concluded that male fetus which generally bears heavy weight might be a predisposing factor for causing uterine torsion in buffaloes. Moreover, the difference might also be related to hormonal changes that occurred during the last stage of labor and vigorous movement of male fetus relative to a female fetus. Noakes *et al.* (2009) opined that delay in diagnosis, almost invariably resulted in the delivery of a dead fetus, due to hypoxia as a result of placental separation. Moreover, the degree of uterine vascular compression in severe torsion was definitely a compromising factor for fetal life due to hypoxia or anoxia and uterine wall damage (Schönfelder *et al.*, 2005).

In the present study, 100% (7/7) buffaloes suffering from 90–180° uterine torsion were survived, whereas survival rates were 90.00 (9/10) and 87.88 (29/33) in the buffaloes with 180–270° and 270–360° torsion, respectively, with an overall mean survival of 90.00 (45/50)%. These results were in line with the report of Mane and Bhangre (2015).

The reduced survival rate of the dam with greater degree of torsion in the present study may be attributed to greater compression of middle uterine artery compromising oxygen supply to the fetus and twisted uterus leading to ischemia, hypoxia and cell death causing irreversible damage to uterus and ultimately death of the fetus (Schönfelder *et al.*, 2005). Ultimately, delay in the correction of severe degree uterine torsion causes the death of the dam due to generalized bacteremia, endotoxemia, or cardiovascular failure (Roberts, 1986). The higher overall dam survival rate in the present study and in some of the referred studies could be due to timely diagnosis and handling of uterine torsion cases, before complications of uterine ischemia, adhesion or fetal emphysema, etc. set in leading to poor survival of dam post-handling/postoperative.

From the study, it was concluded that uterine torsion occurs at lower frequency among all obstetrical problems and is more common in buffaloes in Amul milk shed areas. Buffaloes mostly experience right side (100%), post-cervical (82%) uterine torsion of 270–360° (66%) at full term of gestation (70%) with lower survivability of the calves (30%). If the case is presented, diagnosed, and treated earliest after its occurrence, the successful management of the condition with high survival rates of dam and fetus is possible.

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