INTRODUCTION

Uterine torsion has been reported as a serious cause of dystocia in cattle and buffalo threatening lives of fetus and dam (Amin, 2011). It is defined as the rotation of a pregnant uterus on its longitudinal axis, which leads to narrowing of the birth canal, causing dystocia. The condition was first described in 1766 by Boutrolle (Fleming, 1930). It is more commonly observed in pluriparous than in primiparous animals (Roberts, 1982). In dairy cattle, it is observed more frequently, with reported incidences between 3% and 10.7% of dystocia attended by general practitioners (Aubry *et al.* 2008). Approximately 30% of uterine torsions happen in heifers and 70% in cows (Pearson, 1971). However, heifers are more at risk of dystocia than are cows (Arthur *et al.*, 1996).

The etiology of the condition is not well understood. It generally occurs during late 1st stage or early 2nd-stage labor (Arthur *et al.*, 1996), but Frazer *et al.* (1996) reported some cases of prepartum uterine torsions. In the present case, torsion occurred in late 1st stage of labor. The most important predisposing factor in bovine uterine torsions is the instability of the gravid uterus. Each uterine horn is supported in a dorsolateral direction by the broad ligaments attached to the ventral surface of the uterus. The greater curvature of the uterus is dorsal. In advanced pregnancy, the uterus is positioned beyond the relatively stable area of attachment, resting on the abdominal floor and being supported by the rumen, viscera, and abdominal wall (Sloss and Dufty, 1980). In addition, the manner in which the cow lies down, with the forequarters going down first, and rises, by elevating the hindquarters first, implies that each time the cow lies down or rises, the gravid uterus is suspended in the abdominal cavity. Therefore, a sudden slip or fall could cause torsion of the unstable gravid uterus. However, there must be some contributory factors in addition to instability that occur during 1st-stage labor, otherwise uterine torsion would also be seen frequently in late gestation, which is not the case. Many authors suggest that the increased fetal movements that occur during 1st-stage labor in response to the contraction of the myometrium may be the precipitating

parturient factor. Other factors that have been mentioned are a sudden push from another cow (Pearson, 1971), decreased amounts of uterine fluid, a flaccid uterine wall, a small non-gravid horn, and excessive fetal weight (Frazer *et al.*; 1996, Wright, 1958). In the report of 1 study, pastured animals were more at risk (Desliens, 1967), but in another study, Williams (1943) reported 3 times more frequency in animals confined in stables for long periods. Twin pregnancy, on the other hand, tends to prevent torsion, because the bicornual nature of most cases of bovine twins stabilizes the gravid uterus (Roberts, 1982).

Successful management of torsion depends on the degree and duration of the torsion. Most torsion cases involve left side in counter clockwise direction with 45-90^0 torsion being very uncommon, 20% are 90-180^0, 57% are 180-270^0 and 22% are 270-360^0 (Frazer *et al.*; 1996). A 90-180° torsion occur during last few months of gestation and becomes evident at the time of parturition while 180 - 360° uterine torsion is a severe condition often associated with obstruction of the blood supply to the uterus and finally death of the fetus (Noakes *et al.*, 2009). Therefore, timely management of the problem is important to save the life of the fetus as well as the dam. The routine treatment is rotating the uterus back into its physiological position. Direct and indirect methods of re-torsion are available and used in accordance with the conditions of clinical cases, in order to deliver the calf through vaginal delivery or caesarean section (Erteld *et al.*, 2014). The surgical treatment of uterine torsion by *laparohysterotomy* (caesarean section) present numerous inconveniences, including risk of infection, damage to the internal organs and bleeding, as well as needing more time for recovery. Hence, the non-surgical treatments are recommended more. *Rotation of the fetus* per vaginum is possible only in mild degrees of torsion where the obstetricians hand can touch the fetus and sufficient fluids are present in the uterus (Jackson, 1995). *Schaffer's method* is described as requiring less assistance, technically easier, less stressful, and a faster way to correct torsions than other methods of correction of uterine torsion (Roberts *et al.*, 1973). *The "rolling method"* is one of the most popular methods of detorsion (Noakes *et al.*,

2001a). All of the four legs have to be tied using ropes and the animal has to be rolled suddenly in the same direction as the torsion of the uterus to the other side. After rolling to 180^{o}, her body has to be brought back to the original position. Then the birth canal has to be examined to determine whether the torsion had been corrected, and the rolling procedure has to be repeated 3 or 4 times to confirm the correction in case further torsions were required (Purohit *et al.*, 2011). A modification of rolling method, termed as *'Ball Rolling' method* has almost 30% more recovery rate and shorter delivery time than traditional rolling method along with a significant raise of calf survivability. Both forelegs are tied together at the ankle by rope and the hind legs are stretched behind the hypogastrium, naturally and the "Ball rolling" was performed in the same direction to torsion. The animal is rolled to 360^{0} (as compared to 180^{0} in the traditional "Rolling" method), of which two persons assisted in rolling the animal by pushing its hind legs and keeping them behind the hypogastrium naturally and the other person assisted rolling the parturient cow by pulling the rope tied to the forelegs. The "Ball rolling" could be repeated in case further detorsion was needed (Tao *et al.*; 2016).