

## Uterine torsion in Simmental crossbreed cow

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### ABSTRACT

This case report describes the treatment of uterine torsion in Simmental crossbreed cow. The dam was five years old, twice parity, in nine months and ten days pregnancy. Based on the anamnesis, it is known that the cows show signs of restlessness, straining, more robust by the time. However, there was no visible edema in the vulva, no ruptured membranes, no legs and head of the calf coming out of the dam's vulva. Treatment was carried out by traditional rolling until the maximum uterine lumen opening was obtained. The calf's position is head flexion posture, so to delivery of the calf vaginally, the head is repositioned first and then forced to pull it out until the calf comes out. Post-treatment, the dam's condition was still weak, unable to stand up, did not want to be fed, and only drank a little. The drugs given were analgesics-antipyretics (repeated in the afternoon), long-acting antibiotics, vitamin B1, and vitamins and minerals mixed. After a few hours, the dam was up and walking around, feeding and drinking, and the placenta wholly separated. The calf's condition was alive but weak, female sex. The calf's condition improves gradually after being given milk from the dam. It can be concluded that the case of uterine torsion in Simmental crossbreed cows has been successfully treated 24 hours after the signs of birth using the traditional rolling technique, and the calf can be expelled vaginally. The condition of the dam and calf after the treatment of uterine were torsion gradually became healthy.

**Keywords:** alive calf, dystocia, healthy dam, Simmental crossbreed dam, uterine torsion.

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### INTRODUCTION

Uterine torsion is the rotation or rotation of the pregnant uterus about its longitudinal axis. Uterine torsion is one of the causes of dystocia, leading to calf death and dam abandonment (Purohit *et al.*, 2011). Uterine torsion occurs during the last trimester of pregnancy, both stages of labor during labor (Thangamani *et al.*, 2018b). Post-cervical torsion (Combined uterine and vaginal torsion, Uterine and vaginal torsion) is more common than intracervical or pre-cervical torsion.

Torsion to the left is more common than to the right. Clinical symptoms vary depending on the degree of torsion (Erteld *et al.*, 2012). Torio uteri treatment aims to turn the uterus back (reTorsio or detorsion) to its physiological position. The success of reTorsion is influenced by the timing and degree of uterine torsion. Furthermore, the calf's birth can be done vaginally or by cesarean section, depending on the success of cervical dilatation. The viability of calves born from uterine torsion cases varies from 14-90%. After the incidence of uterine torsion,

postpartum development in cows also varies, ranging from mild irritation, a more extended period of uterine involution, to fatal complications that can occur. The effect of uterine torsion on fertility depends on the success of parturition treatment and secondary complications. Complications in the form of electrolyte disturbances are about 50%, birth-related injuries are about 20%, and placental retention varies widely between 3-52% (Erteld *et al.*, 2014). The incidence of uterine torsion is between 0.5 and 1% of all births in Germany (Erteld *et al.*, 2012).

Most cases of uterine torsion are successfully corrected and followed by vaginal delivery with live calves. Pluriparous cows have a greater risk of uterine torsion than heifers, while dams with feto-pelvic disproportion or twin pregnancies have a lower risk (Aubry *et al.*, 2008). Farmers' economic losses from cows with intrapartum uterine torsion include maintenance costs, infertility, calf mortality, and maternal mortality (Schönfelder and Hasenclever, 2005a; Schönfelder and Sobiraj, 2006b).

There are no published reports on uterine torsion in cows in journals published in Indonesia. This case report discusses the incidence of uterine torsion in Simmental Breeds, including case history of cows, signs observed, history taking, treatment, drug administration, maternal condition, and post-aid fetal condition.

## MATERIALS AND METHODS

The Simmental Crossbreed cow that experienced the uterine torsion case belonged to a farmer in Seloharjo Village, Kapanewon Pundong, Bantul Regency, Special Region of Yogyakarta. The cow is a Simmental crossbreed, five years old. The cow fed Kalanjana grass, straw, bran, and wheat bran. The cow's reproductive history has given birth twice, previously repeated mating 17 times at the previous owner's and four times at the time of the case occurred. The gestation period is nine months and ten days.

## Anamnesis and physical examination

Based on the anamnesis, it is known that on July 25, 2021, at 15.00, the cows began to get restless, walked around in the cage, lay down, and stood alternately. Furthermore, the cow started to strain stronger by the time, but the vagina did not appear edematous. There was no visible rupture of the membranes, neither legs nor the head of the calf that came out of the dam's vulva. The situation lasted until the next day. Even the cow's condition was getting weaker, often lying with legs stretched stiffly forward while continuing to push. Cows did not want to be fed and drink since they started to feel the signs of giving birth. On 26 July 2021, at 6.30, the owner contacted the Veterinarian for treatment. Veterinarians immediately came to the location (6.45 hours) and examined. It was found that the bodyweight of the dam was approximately 400 kg, five years old, the temperature was 39°C, and the dam looked tired. Examination through vaginal exploration revealed that the lumen of the uterus was blocked, fully torsioned to the left.

## Treatment

When the dam is examined in a standing position, the dam is laid down using the side rope method first. Furthermore, the dam was rolled over several times to obtain the maximum uterine lumen opening position. The calf's position was head flexion posture to remove it vaginally. The head was repositioned first. Next, the head was tied, followed by the binding of the two ankles of the calf; after that, a forced pull was carried out until the calf came out. The drugs given are analgesics-antipyretics (repeated in the afternoon), long-acting antibiotics, vitamin B1, and vitamins and minerals mixed in drinking water.

## RESULTS

Post-treatment, the dam's condition was still weak, unable to stand up, did not want to be fed, and only drank a little.

After a few hours, the dam was up and walking around, fed, and drank a little, and the placenta was completely separated. The calf's condition was alive, female sex, weighing approximately 40 kg, and weak, indicating that the calf was inhaling much amniotic fluid. The calf was treated to expel the fluid and immediately milk the dam. Milk from the dam was expressed and given to the calf with a syringe. The calf's condition gradually became healthy, was able to walk in the afternoon and finally suckle on its own from its dam.

## DISCUSSION

Uterine torsion is the rotation of the pregnant uterus on its longitudinal axis, narrowing the birth canal and causing dystocia. Uterine torsion can be categorized to the left or right according to the direction of rotation; light, moderate or severe by degree; and pre-cervical, cervical or post-cervical based on torsion position (Amer *et al.*, 2008). Uterine torsion in a cow can be caused by the decreased amniotic fluid concerning the size of the calf and uterus. Uterine destabilizing factors (decreased tone, uterus outside the supraomental bursa) increase the likelihood of uterine torsion (Schönfelder and Sobiraj, 2005c).

### Prevalence

The cow with uterine torsion case in this study was a Simmental crossbred cow born from a local dam (usually Ongole crossbreed cow) which was inseminated with frozen semen of the Simmental bull. Breed affects the incidence of uterine torsion (Gevrekci *et al.*, 2011) because, among cow breeds, there are variations in the orientation of the attachment for the broad ligament of the uterus (Aubry *et al.*, 2008). *Bos taurus* cows (including Simmental cows) are more susceptible to uterine torsion when compared to *Bos indicus* cows (Ongole crossbreed cow). This is because the broad ligament in *Bos taurus* cow is attached only to the ventrolateral side of the uterus, whereas in *Bos indicus*, the broad

ligament is attached to the anterior two-thirds of the uterus and the ventrolateral side to the posterior one-third of the uterus. (Aubry *et al.*, 2008).

Cows are more susceptible to uterine torsion than many other domestic animals due to uterine instability due to the attachment location for the broad ligament of the uterus. In addition, the way the cow stands from lying on the sterna recumbency may contribute to the torsion (Noakes *et al.*, 2009b). In cows, uterine torsion is one of the causes of dystocia faced by field veterinarians (Jeengar *et al.*, 2015). The highest risk of uterine torsion occurs around the last trimester of pregnancy (Thangamani *et al.*, 2018a). The prevalence of uterine torsion in Indonesia has not been reported. In Portugal, the incidence of uterine torsion is relatively high in Holstein-Friesian cows released from pasture, which is 24.4% of the total cases of dystocia (Faria and Simões, 2015). Meanwhile, in the United States and Canada, the incidence of uterine torsion in a dairy cow is reported between 3–10.7% of dystocias cases (Aubry *et al.*, 2008).

### Clinical signs

In general, cows' health condition with uterine torsion is initially normal, but gradually the condition decreases until delivery (Faria and Simões, 2015). In this case, the cow did not want to be fed and drink since the parturition started. The symptoms reported by the farmer were that the cow was restless, walked around in the barn, lay down, and stood up alternately. Furthermore, the dam started to strain harder and harder, but there was no visible discharge of amniotic fluid, no visible legs or head of the calf. Vaginal edema also did not appear. The dam looked exhausted, and on physical examination, the temperature was 39°C. This situation lasted for about 24 hours, with the condition of the cow getting weaker, lying with legs stretched stiffly forward while continuously straining. These clinical signs are similar to those of cows with uterine torsion reported by Bai *et al.* (2016), which shows restlessness, kicking, and pushing without being followed by the appearance of the fetal membranes from the

vulva, the dry vaginal lumen does not secrete mucus.

### Diagnosis

In this case, vaginal exploration revealed a dead-end canal, the uterine palpable full left twisted. Uterine torsion examination can be conducted vaginally and rectally. Per vagina, the vaginal wall was not lubricated, and labia vulva was invaginated. The rectal examination, the rotated cornua can be palpated, one side of the broad ligament is pulled down under the torsion of the lower uterine body, while the opposite cervical and broad ligaments were pulled over the uterine body, a spiral uterine twist can be felt (Bai *et al.* 2016). Since uterine torsion is 0–90°, rotation can be felt in the vaginal canal, the forelegs and fetal head can be reached. Torsion of 90–180° causes blockage of the birth canal, making it difficult to insert the hand into the uterus. At the 180–360° uterine torsion, only one or two fingers can enter the uterine lumen, the fetal membranes cannot pass through the cervix, and the calf cannot be reached (Bai *et al.*, 2016).

### Predisposition

The etiology of uterine torsion is due to the instability of the uterus during single pregnancy in one horn accompanied by excessive movement of the calf or dam (Purohit *et al.*, 2011). The predisposing factor for uterine torsion comes from the dam and the calf (Ghuman, 2010). Dam factors include the anatomy and orientation of the broad ligament of the uterus, the location of the uterine horn, the condition of the rumen collapse, the parity of the dam, the barn condition, accidents/falls, and the serum hormonal profile. Species affect the incidence of uterine torsion, among others, based on differences in the anatomical structure of the uterus of each species (Gevrekci *et al.*, 2011). In a cow, the greater curvature of the convex portion of the uterus faces upward. There are two folds of the peritoneum (mesometrium) hanging from the uterus that are part of the broad ligament of the uterus. The bovine uterus is bound by the broad ligament of the uterus on the

dorsolateral side of the uterus. This causes cows to be more prone to uterine torsion than horses. In horses, the broad ligament is attached to the greater curvature, or the convex part of the uterus is facing downwards, so the frequency of uterine torsion is smaller than in cows (Chaney *et al.*, 2007).

The location of the uterine horn containing the calf also predisposes to uterine torsion. Cornua of the uterus containing the calf are located in the supraomentalis region. Along with the development of gestational age, the gravid uterus extends out of the supraomental area, causing reduced stability and susceptibility to uterine torsion (Schonfelder and Sobiraj, 2005c). The extension of the gravid cornua to the ventral without the support of the broad uterine ligament at the end of the cornua causes uterine rotation on the side of the gravid cornua (Thangamani *et al.*, 2018b).

In this case report, cows were fed grass, straw, bran, wheat bran, and uterine torsion, which occurred on the left. The rumen acts as a barrier structure for the gravid uterine horn to prevent left uterine torsion. However, cows fed more concentrates resulted in a smaller rumen size, thus predisposing to increasing the space for uterine torsion (Thangamani *et al.*, 2018b). In dairy cows, abomasal displacement is also a predisposition to uterine torsion (Beltman, 2013).

The cow has given birth twice in this case report and is always kept in a barn. Cow's parity is a predisposition to uterine torsion. In cows that have given birth, the abdominal cavity becomes more spacious, and the mesometrium is loose, the broad ligament of the uterus is longer. The decrease in uterine tone also increases with the increasing age of the cow (Aubry *et al.*, 2008). This causes susceptibility to torsion (Thangamani *et al.*, 2017). A cow always kept in captivity without physical exercise weakens the abdominal muscles and can cause uterine torsion. In addition, there is also a risk of fighting (or) being hit by other cows as a cause of uterine torsion (Aubry *et al.*, 2008). In addition, the habit of cows lying on their front legs first and getting up with their hind legs first can result



in uterine torsion (Drost, 2007). At the time of preparation for parturition, there is a decrease in progesterone levels followed by an increase in serum estrogen levels which are very important for uterine contractions. However, before parturition, progesterone levels are still high and vice versa; low estrogen will cause the uterus to soften as one of the causes of uterine torsion (Amer *et al.*, 2008).

Fetal factors that predispose to uterine torsion include the weight and sex of the calf, the amount of amniotic fluid, fetal movement, and uterine tone. Excessive calf weight (Thangamani *et al.*, 2017), including fetal ascites (Maninderjeet Singh *et al.*, 2018), is a common precipitating factor for uterine torsion due to unilateral single pregnancy. The incidence of uterine torsion is more common in the birth of male calves with above-average birth weights (Thangamani *et al.*, 2017).

The amniotic fluid serves as a medium for fetal movement. Lack of amniotic fluid triggers fetal stress so that the calf performs strong reflexive movements that result in uterine torsion. Shrinking the size of the uterus due to lack of amniotic fluid also causes the free movement of the gravid uterus to be prone to twisting (Schonfelder and Sobiraj, 2005c). Uterine torsion correlates with the weak uterine tone with active fetal movements. If only based on uterine instability, uterine torsion is only 90-180°, while uterine torsion of more than 360° occurs when fetal movement is very active (Thangamani *et al.*, 2018b).

### Treatment

The position of the dam was standing when examined, and then the cow was laid down using the side rope method (Awaludin *et al.*, 2017). Furthermore, the cow was rolled over several times to obtain the maximum opening of the uterine lumen. Routinely, the relief of uterine torsion is to rotate the uterus back to its physiological position. The method of retort can be conducted directly or indirectly according to the conditions of the clinical case, with the primary goal of expelling the calf vaginally. If the retort fails, the expulsion of the calf is

carried out by cesarean section (Erteld *et al.*, 2014). Treatment of uterine torsion with laparohysterotomy carries the risk of infection, damage to internal organs, bleeding, and a longer recovery time. Non-surgical treatment with the rolling method is more common. However, the higher the uterine torsion severity was followed by lower live calf birth (Bai *et al.* 2016). Immediate treatment and appropriate treatment for retort lead to higher survival of the dam and calf. Modification of the Sharma method (rolling technique assisted by uterine fixation with a wooden plank) provides better success in the uterine retort (Mane *et al.*, 2015).

In the traditional rolling method (Schafer method), the cow is laid laterally on the same side as the torsion direction. Both hind legs are tied with ropes, as are the front legs. Then suddenly, the cow was rolled from the torsion direction to the other side. Uterine torsion was corrected when vaginally calf was accessible (Bai *et al.* 2016). However, if the torsion has not been corrected, the dam must be rolled back to its original position, and the rolling repeated three or four times until the torsion has been corrected (Purohit *et al.*, 2011). A modification of the traditional rolling method called the ball rolling method was developed by Bai *et al.* (2016). The forelegs are tied together at the ankles, and the hind legs are left lying out behind the hypogastrium. Two-person roll the dam by pushing its hind legs and holding it behind the hypogastrium, and another person rolls the cow on its front legs. Uterine torsion of the same degree (270°) requires six rollings using the traditional method, but only two rolling using the ball rolling method. The ball rolling method requires relief time, and the amniotic fluid discharge time is shorter than the traditional rolling method. The fetal survival rate is higher using the ball rolling method than the traditional method. The ball rolling method also increases the cure rate compared to the traditional rolling method, which is more effective in treating uterine torsion between 180-270° (Bai *et al.*, 2016).

## Prognosis

Most uterine torsions point to the right side (clockwise), with post-cervical torsion locations with torsion 180-270° (Thangamani *et al.*, 2018b). The maternal prognosis is best at 180-270° uterine torsion if the torsion duration is less than 24-36 hours and worsens with time (Thangamani *et al.*, 2018a). As for the calf's survival, if uterine torsion lasts six hours, 6-12 hours, and more than 12 hours, then the viability of the calf decreases from 92.2% to 85.7% and 34.8%, respectively. Delay in treatment leads to a worse prognosis for the calf and the dam (Klaus-Halla *et al.*, 2018). In this case, uterine torsion had lasted 24 hours before the rescue was carried out so that the life of the dam and calf was saved.

Uterine torsion increases adrenocortical activity and affects the cellular components of blood vessels, followed by decreased metabolism of the liver, kidneys, and muscular system. Hemato-biochemical compounds correlated with the severity of torsion, which can determine prognosis. Pathophysiological and hemato-biochemical status in cows with uterine torsion, liver, and kidney function tests can be used as prognostic indicators and predict the outcome of uterine torsion. The blood lactate biomarker predicts the prognosis of dams with uterine necrosis due to the severity of uterine torsion (Thangamani *et al.*, 2018a). Haptoglobin concentration can indicate the degree of uterine damage during parturition and as a predictor of uterine regenerative potential. Normal parturition cows have low haptoglobin concentrations. Cows with uterine torsion showed significantly higher haptoglobin concentrations than those with normal births (Schönfelder *et al.*, 2005b). An increase in haptoglobin indicates a higher risk of secondary infection and complications so that it can be used for the prognosis of maternal fertility post uterine torsion (Schönfelder *et al.*, 2006a).

## Condition of the dam and calf post-treatment

After the treatment, the dam was given antipyretic analgesics (repeated in

the afternoon), long-acting antibiotics, and vitamin B1, as well as a combination of vitamins and minerals mixed with a combo. The dam was alive but weak, unable to stand up, not wanting to be fed, and had little to drink. After a few hours, the dam was up and walking around, wanting to be fed and drink a little, the placenta was completely separated. Based on the previous report, the percentage of success of the rolling technique for uterine torsion is very good. The delivery rate vaginally and maternal mortality after treatment with the rolling technique were higher than the cesarean section (Faria and Simões, 2015). In a British dairy cow, 93% uterine torsion was corrected with the rolling technique (Lyons *et al.*, 2013a).

The calf position in the uterine torsion dam can be an anterior longitudinal presentation, dorso-sacral, dorso-ilial, or dorso-pubic position with head/neck flexion and bilateral carpal flexion (Thangamani *et al.*, 2018b). In this case, the calf was in head flexion posture. Head repositioning is conducted by retropulsion frontalis followed by traction on the mandibular of the calf. The head and both front ankles of the calf were tied and then pulled gently until the calf was born. The calf's condition was alive, female sex, weighing about 40 kg, weak condition, inhaling much amniotic fluid. Treatment for removing amniotic fluid was carried out and immediately given to drink the dam's milk (expressed and drunk with a syringe). The calf was in good health, could walk in the afternoon, and finally suckle itself from the dam. After a vaginal delivery, the probability of a live calf from a dam cow with uterine torsion is about 81% (Faria and Simões, 2015). Fetal death in uterine torsion occurs due to loss of amniotic fluid or detachment of the placenta. Most live calves occur when the fetal membranes are intact during uterine torsion treatment (Lyons *et al.*, 2013a).

Among the cows that successfully gave birth to calves after uterine torsion, 57% of them experienced infertility.

Although due to uterine torsion, the survival rate of the dam is high, due to the death of the calf and the rate of infertility, it is better to take preventive measures (Lyons *et al.*, 2013a). Dairy cows with uterine torsion are often vulnerable to decreased fertility which requires much money to restore their reproductive health. The process of uterine involution is not affected by the degree of uterine torsion, but the postpartum first conception and the calving interval are affected by uterine torsion (Sickinger *et al.*, 2020). In this case, the dam was in heat again, and artificial insemination was carried out 70 days after giving birth, but 2.5 months after it was not pregnant on rectal examination. When this article was written, the calf is five months, in good health, and with normal growth.

Dystocia in a cow is terrible and has a significant economic impact on farmers (Mee *et al.*, 2011). Uterine torsion is one of the causes of dystocia. Although the prevalence of uterine torsion is relatively low (3–10%) (Laven and Howe, 2005), certain predispositions cause an increased incidence of uterine torsion in more than 20% of dystocia cases (Aubry *et al.*, 2008). Therefore, maintenance management is essential to reduce the incidence of cases (Olmos *et al.*, 2009).

## CONCLUSION

The case of uterine torsion in Simmental crossbreed cows has been successfully treated 24 hours after the birth signs using the traditional rolling technique, and the calf can be expelled vaginally. The condition of the dam and calf after the treatment of uterine torsion gradually returned to health.

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