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Short Communication

Left oblique laparotomy for caesarean section in a cow due to dystocia

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Abstract: Caesarean Section is a surgical procedure in which an incision is given through the abdominal wall and uterus in order to deliver fetus. It is also known as C-section is one of the most challenging surgical procedures in case of dystocia to save fetus live. A 6 years old HF cross breed cow, weighing 300 kg was admitted to the Teaching Veterinary Hospital (TVH), Chittagong Veterinary and Animal Sciences University (CVASU) with a history of prolonged labour pain. At first all the physical examination was done. Blood sample was collected to know different parameters of serum and blood. As Per vaginal examination revealed incomplete dilation of cervix. Then, it was decided and performed caesarean section using left oblique laparotomy and a live female fetus was delivered. Post operative care was taken for 10 days. The cow recovered successfully without any complications. The cow was followed for next one year. 70 days after surgery, she came to heat and after insemination pregnancy was confirmed at 35 days post AI. The cow had successful pregnancy which was confirmed by rectal palpation at 35 days. Caesarean section through left flank oblique laparotomy is an effective method of resolving dystocia to save cow with fetus.

Keywords: caesarean section; dystocia; management

1. Introduction

A caesarean section, also called a C-section refers to a surgical procedure in which an incision is given through the abdominal wall and uterus in order to deliver fetus. The first caesarean section in case of cattle had reported as early as 1930s to save a cow. Now a day, it has gained popularity due to high feto-maternal survival rate, less tiring, quicker, more secured than fetotomy. 90% of caesarean case is performed due to dystocia (Vermunt *et al*., 2008) in all farm animals, which unless relieved, leads to death of the fetus and some-times to the death of the dam (Roberts, 1986). Among all domestic animals, cattle and buffalo are considered to be most suspicious species having highest incidence rate of dystocia (Purohit *et al*., 2011). Though cattle and buffalo have same reproduction process cattle are more prone to dystocia than buffalo (Jainudeen, 1986). Dystocia may be of fetal or maternal origin (Noakes *et al*., 2009). Fetal causes of dystocia include mainly malposition and monsters (Majeed and Taha 1989a; Noakes *et al*., 2009). Maternal causes of dystocia include incomplete cervical dilatation (ring womb), narrow pelvis, and uterine inertia (Majeed and Taha 1989b; Thomas, 1992; Noakes *et al*., 2009). According to Lucky *et al*., (2016) the prevalence of dystocia was 21.18% in cattle and 12.5% in goats in syhlet district in Bangladesh. In cows the incidence of dystocia is higher in heifer than pluriparous (Berger *et al*., 1992; Zaborski *et al*., 2009). Incidence of dystocia due to cervical cause was seen to vary from

11.1 to 16.7 percent (Wehrend *et al*., 2003) in cows. In large ruminants, dystocia or difficult birth contribute a significant economic loss in terms of loss of perinatal death of dams and fetus, uterine infections, more retained placentas, and longer calving and intervals (Ghosh *et al*., 1992; Brounts *et al*., 2004). Dystocia is an emergency condition. Any delay in correction or management of dystocia may seize the life of dam or calf. In certain situation caesarean section may save life of both or anyone between dam and calf. There is lack of published reports on C-Section of cow due to dystocia. However there was a report on C-section on cow due to mummified fetus (Azizunnesa *et al*., 2010). A number of surgical approaches are available for the bovine caesarean section including recumbent or standing left paralumbar laparotomy, recumbent or standing right paralumbar laparotomy, recumbent ventral midline laparotomy, recumbent ventral paramedian laparotomy, ventrolateral laparotomy and the recumbant left oblique laparotomy (Schultz *et al*., 2008). Each of this approach varies greatly and has its own advantages and disadvantages. Selection of an approach for C-section mainly depends on skill of the veterinarian and other factors such as the type of dystocia, the cow's condition, the environmental conditions and the availability of assistance during surgery (Campbell and Fubini, 1990). For this reason, it is worthwhile to select a suitable site for operation in a laying cow and most often the left paralumbar fossa approach is favored by most veterinarians (Vermunt, 2008). This technique is less practiced in field condition in Bangladesh and reports on this procedure are limited. The objective of this study is to investigate caesarean section in the HF cross performed under clinical conditions and attempt to describe a caesarean section in a HF cross cow with recumbent position using distal paravertebral and low epidural anesthesia.

2. Case history

A 6 years old HF cross cow with parity 3 weighing 300 kg was brought to the Teaching Veterinary Hospital, Chittagong Veterinary and Animal Sciences University (CVASU) with a history of prolonged gestation. The owner claimed that the cow has not delivered even 286 days of gestation. At first general physical examination was done. On clinical examination the cow revealed normal temperature, respiration, heart rate and pulse rate. The behavior of the animal was restlessness and appetite was not satisfactory. Per vaginal examination revealed partial opening of the cervix with existence of live fetus. Blood sample was collected to find out different parameters of serum e.g. calcium, phosphorus, magnesium etc (Table 1 and Table 2). We decided to perform a cesarean section to deliver calf using left oblique laparotomy.

Table 1. Biochemical blood analysis in cow before C-Section.

Name of the test	Result	Normal Range
S. Calcium	7	9.7-12.4 mg/dl
S. Magnesium	1.3	1.8-2.3 mg/ dl
S. Phosphorous	3	5.6-6.5 mg/dl

Table 2. Routine blood test in cow suffering before C-Section.

Name of the test	Result	Normal Range
Hemoglobin	8	8-15 gm%
ESR (Wintrobe tube method)	12	6-10 (mm in 1st hour)
Total count of RBC	5	5-10 million/ cumm
Total count of WBC	6	4-12 thousand/ cumm
PCV	22	24-46%
Lymphocytes	72	45-75%
Neutrophils	25	15-45%
Eosinophils	6	0-20%
Monocytes	3	2-7%
Basophils	1	0-2%

3. Restraining and anesthesia

Both physical and chemical methods were used to control the cow. The cow was restrained using a rope, tied such that the animal's right flank is on the ground and the head was bended in ground in order to limit movement during surgery. After restraining, low epidural injection was done at 1st intercoccygeal using 5 ml 2% lidocaine hydrochloride (Jasocaine®) solution to control the tail and desensitize the hind region. Then the cow was prepared for aseptic surgery.

The area of the intended incision was clipped, shaved then soaked with 70% alcohol followed by painted with povidin iodine (Figure 2). After clipping and shaving, distal paravertebral anesthesia was done with 2% lidocaine hydrochloride (10ml at each site) to block ventral branch of $T_{13,}$ $L_{1,}$ L_2 nerves. 2% lidocaine hydrochloride (Jasocaine®) solution 1ml per cm area subcutaneously was administered locally at the incision line. As the incision line was 20 cm long it required 20 ml local anesthetic to anesthetized the area (Figure 3).

4. Surgical correction

A left oblique laparotomy approach was used for caesarean section at laying position. A draper was placed over the area of the site of surgery and an about 20 cm long oblique incision along the skin of the lower flank was made (Figure 4) and separated from the subcutaneous layer. The incision was given 2 to 3 cm ventral and cranial to the tuber coxae, extended cranioventral at 45 degree angle to the ground. The external abdominal oblique muscle was incised in the same direction as the skin. The internal abdominal oblique muscle and transverse abdominis muscles were guided parallel to the incision using a combination of sharp and blunt dissection and ligating (Figure 5) all the blood vessels and cutting by taking care to avoid major blood vessels. Following separation of the muscles by blunt dissection, the peritoneum was incised and then guiding a cut by a finger placed underneath the peritoneum. After identifying the uterus, the portion of the uterus containing a head was pulled up into the abdominal incision by grasping the calf's head. Then incision was given along the greater curvature of the uterus avoiding major blood vessels. Huge amount of amniotic fluid came out and one live calf was pulled out. Then the placenta was removed manually. Before closing the abdominal cavity, the inner surface of uterus and peritoneal cavity were given a good flush with normal saline to reduce contamination. The uterus was closed with by czerny-lembert suture pattern (Figure 7) with a synthetic absorbable monofilament cat gut No. (3-0). An atraumatic needle was used starting well above the incision and using an inverting pattern without penetration of the wall. Then peritoneum and muscle layers were closed with using by simple continuous suture using Cat gut No. (3-0). In case of abdominal muscle layers individual layer was sutured (Figure 9) separately and antibiotic stretopenicillin was scattered over the suture line to reduce bacterial contamination. For better apposition subcuticular suture was applied using cat gut No. (3-0). Then horizontal mattress sutures were used in the skin using non-absorbable suture material silk (Figure 10). A povidone iodine solution was applied over the sutured line. The animal was then monitored for a period of 14 days to observe any complication until complete healing.

Figure 1. Cow before surgery.

Figure 2. Cleaning and shaving of surgical site of the cow.

Figure 3. Adminitrating local anaesthetic at the site of incision.

Figure 4. Incising the skin.

Figure 5. Incising the skin and suturing the major blood vessels.

Figure 6. Assisting respiration of new born calf.

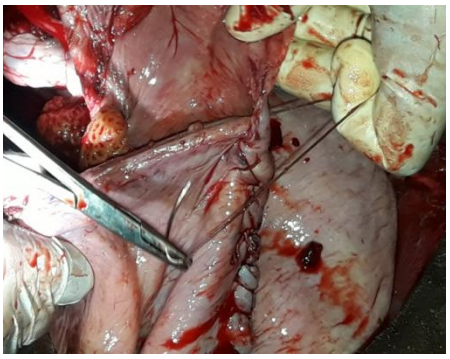

Figure 7. Czerny-lembert Suture pattern in the uterus.

Figure 8. Repositioning the uterus to its normal position.

Figure 9. Simple continuous suture pattern in abdominal muscle layer.

Figure 10. Horizontal mattress suture pattern on skin.

5. Post operative care of calf

Following delivery of the calf, fluid was removed from the nostrils and mouth. Then hang the calf holding its hind legs above and front legs downward. Then we rubbed brisket of the calf with clean dry cottons to stimulate

breathing (Figure 6). As the fetus was breathing normally there was not suggest any further drug. The umbilical stump was dipped in a diluted povidone iodine solution and ligated with suture material.

6. Post operative care of dam

After surgery, sufficient fluid replacements, antibiotics and anti-inflammatory drugs were given for 5 days to combat toxemia. Oxytocin [Inj. Oxin® Vet (Techno pharceuticals) 20 IU single dose i/m/cow] to prevent uterine bleeding and to increase uterine contraction to expel out fluid and fetal remnant, 5% dextrose saline [(Zoetis INC.) 1 litre/day/cow/i/v], for 5 days as fluid therapy, Streptopenicillin [Inj Streptopen, 10 mg/kg/day/cow/i/m for 5 days, Reneta pharceuticals Ltd, Bangladesh), Calcium borogluconate [Inj. Cal-D-Mag (Reneta pharceuticals Ltd, Bangladesh) 500 ml/day/i/v] for 5 days, Meloxicam [Inj. Melvet®, (Acme Laboratories Ltd., Bangladesh) 40 mg/Kg body wt/cow/day/s/c] as analgesic, Chlorpheneramine maleate [@1 mg/Kg body weight, (Inj. Astavet®, Acme Laboratories Ltd., Bangladesh) 1 mg/kg body wt/day/cow/i/m) for 5 days] as antihistaminic, drotaverine hydrochloride [Inj. No-spa 20 ml/day/i/m (Ambee Pharmaceuticals)] for 5 days as antispasmodic was admninistered. For topical application at incision line in skin 5% Povidone iodine [Ointment viodin (Square pharceuticals)] was recommended. Temperature, respiration, heart rate and other related physical examinations were done regularly and recorded. The behavior and appetite of the cow was satisfactory. During post operative period Periodic rectal palpation was done to determine the condition of uterus. 70 days after surgery the cow showed heat sign but the cow was inseminated 21 days after 1st heat. Subsequently after insemination rectal palpation was done at day 35 and pregnancy was confirmed. No complication was recorded and the cow had an uneventful recovery and successful pregnancy following parturition.

7. Discussion

Caesarean section is widely used an emergency operative technique for surgical delivery cattle calves in dystocia affected cows. Following Caesarean section the survival rate of dam has been recorded 36-100% (Phogat *et al*., 1992; Singh *et al*., 1978; Dhindsa *et al*., 2010). The survival rate may reach 64.7-100% if the operation is done within 24-26 hours of dystocia (Nanda *et al*., 1991). The economy of a farm depends on one calf per year per cow. Deviation from this causes loss to farm. So if the fetus is live and all other efforts relieving dystocia fail, we should go for caesarean section. In the present case, a left paralumbar laparotomy approach was used for caesarean section in a recumbant HF cross cow to deliver a calf under distal paravertebral and low epidural anaesthesia which is almost similar to Azizunnesa *et al*. (2010) though they did the surgical procedure in standing condition. C-Section of a cow in recumbent condition is somewhat different from standing condition. Closure of the abdominal wall is straightforward and relatively easy, less assistance is necessary and exteriorization of gravid uterus is easier (Schultz *et al*., 2008) in case of standing condition. Sometimes sedation is required and xylazine hydrochloride is commonly used in this purpose (Newman, 2008). Both physical as well as chemical restraining provided to control the cow. Distal paravertebral anesthesia was performed that is also described by Weaver (1986); Kumar (1996); Thangaraj *et al*. (1972); Rao *et al*. (1975) and using light sedation was mentioned by Kumar (1996); Sathya *et al*. (2006); Singh *et al*. (2006). The advantage of paravertebral anaesthesia is that it desensitizes the entire flank, including the peritoneum, which promotes exploration of the abdomen during surgery and closure of the wound. It also facilitates the flank incision can be extended incision readily if required at the time of surgery. One disadvantage of this technique is it required an expert to do the anesthesia. In addition the cow may be unsteady after surgery due to loss of lumbar muscle tone. In this case no such situation observed. Singh *et al*. (2013) used lembert suture pattern, absorbable suture material [Cat gut No. (3-0)] which is also applied in this case. The usefulness of low-epidural anesthesia is indicated by Vermut *et al*. (2008) which is similar to this study. In uterus inverting suture pattern e.g. Czerny lembert, in muscles apposition suture pattern e.g. simple continuous and in skin everted pattern e.g. mattress suture was given which follows the report of Schultz *et al*. (2008). The success of an operation depends on careful post operative care. Sood *et al*. (1999) described as antibiotic, antihistaminic, anti-inflammatory, fluid therapy as post operative medication which is similar with our study. The calf was found live following caesarean section. It is important to remember that caesarean section is a major abdominal operation and complications are common both during and after the operation. Common complications include metritis, adhesions, peritonitis, hemorrhage, wound dehiscence, poor fertility, disgalactia etc which is also reported by Velhankar *et al*. (1968); Newman *et al*. (2005). In the reported case, no such complication was recorded and the cow was fully cured up to 14 days observation 70 days after surgery the cow showed heat and pregnancy was confirmed by rectal palpation at 35 days post AI which is also found Azizunnesa *et al*. (2010). It can be said that C-section preserves maternal fertility.

8. Conclusions

Caesarean section through left flank oblique laparotomy is an effective method of resolving dystocia in small ruminants even if it performed in delayed cases of dystocia. The information of this report will enrich the knowledge of owner and field veterinarian to early diagnosis, treatment management of dystocia. This case will also inspire the veterinarian of Bangladesh to perform caesarean section at field condition to save endangered mother and her calf. Thus in future the researchers may investigate the future fertility of cow having history of caesarean section.

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Conflict of interest

None to declare.

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