



Veterinary Surgery and Obstetric Department



# Caesarean Section (Hysterotomy)

## Surgical Anatomy

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The cow has a tortuous 20- to 28-cm long uterine tube with a fimbriated infundibulum, which is large and may completely envelop the ovary. A nonpregnant adult cow has 35- to 45-cm long uterine horns that are united closely at the body of the uterus but diverge and spiral ventrally, caudally, and finally dorsally. The horns are joined just before their divergence by an intercornual ligament. The body of the uterus is only about 3 cm long. With repeated pregnancies, the uterus becomes thicker-walled, and the spiral of the horns becomes flatter. The broad ligaments that suspend the uterus from the lateral wall of the pelvic cavity are extensive and become thickened with multiple pregnancies. The round ligaments of the uterus arise from the lateral surface of the broad ligaments. They serve to elevate and lower the uterus. The cervix is a substantial barrier to the uterine lumen. In addition to the normal layers of viscus, the ruminant cervix is infiltrated with collagenous fibers that make it exceedingly tough. The number and regularity of the annular rings varies with the species: the cow has three to five, the ewe five to six, and the doe five to eight. The cervix rarely dilates except under hormonal influences. The bovine cervix is rarely injured because of its tough and tortuous course.

# Indications

**The indications for surgery include:**

## **1-Maternal reasons:**

A relatively oversized fetus, (particularly in heifers that are immature or recipients of embryo transfer calves), inadequate cervical dilation, abnormal pelvic conformation, prepubic tendon rupture, Irreducible uterine rupture, uterine torsion, uterine inertia, hydrops of the amnion or allantois, and congenital or traumatically induced vaginal constriction and atresia or hypoplasia of maternal vagina or vulva .

## **2-Fetal indications**

Include fetal malposition that is not correctable per vagina, absolute fetal oversize, fetal monsters, and emphysematous fetuses. Other, ancillary indications include elective cesarean section for the delivery of embryo transfer calves, the production of gnotobiotic calves, or terminal cesarean sections.

Such cases today have a better prognosis if treated before onset of recumbency with corticosteroids or prostaglandins, followed several days later by an i.v. Oxytocin drip in refractory cases.

## **Preoperative observation and preparation**

A general physical examination should be performed on the cow, including assessing the animal's attitude, appetite, and hydration status. The mammary gland should be checked for mastitis, and it is appropriate to check ear temperature and rumen motility as indicators of hypocalcemia. More sophisticated laboratory tests,

such as determining plasma electrolyte concentrations, are rarely indicated. After a physical examination, a reproductive examination consisting of a rectal exam to assess the uterus and position of the calf and a vaginal exam to determine whether the cervix is dilated and calf presentation is normal should be performed. Ballotment of the abdomen from the right and left side may indicate the side of the abdomen where the calf IS located.

## **Contra-Indications**

- Cattle In Very Poor Bodily Condition (Cachectic)
- Emphysematous Fetus
- Most Cows With Uterine Infection

Caesarean Section May Still Be Preferable To Embryotomy (Fetotomy) In Cases Of General Debility And Prolonged Dystocia Despite The Presence Of Dead Fetus.

## **Advantages Of Caesarean Section Over Embryotomy Include:**

- Potential Fetal Survival
- Usually Faster And Safer Procedure
- Feasibility Where Embryotomy Would Be Impossible (Cervical Non-Dilatation)

## **Surgical technique methods:**

- 1. Standing Paralumbar Fossa Celiotomy**
- 2. Ventral Midline Celiotomy**
- 3. Paramedian Celiotomy**
- 4. Ventrolateral Celiotomy**
- 5. Left Oblique Celiotomy**

## **Surgical technique: Flank**

- Give caudal epidural block (e.g. 5 ml 2% lignocaine) to any cow which is straining considerably, as tenesmus hampers precise incision of uterus, and can even provoke ruminal wall prolapse through flank incision
- clip, scrub and disinfect entire paralumbar fossa (last rib to hip) and apply sterile drapes
- make 30–35 cm vertical incision in middle or caudal third of left paralumbar fossa (see figure 3.6(4) and effect careful haemostasis of flank vessels
- insert hand into abdomen pushing rumen forward and feeling ventrally and caudally
- make rapid assessment of fetal position and condition of uterine wall
- attempt to bring greater curvature of gravid horn towards abdominal incision by always grasping uterine wall over protruding part of fetus (e.g. Limb, hock in anterior presentation)
- attempt to exteriorise greater curvature of gravid horn
- note that, unless there is severe intra-uterine infection (e.g. Grossly emphysematous fetus), entry of uterine fluid to contaminate abdominal cavity is rarely hazardous
- grasp fetal leg (e.g. Digits or point of hock) through uterine wall and maintain firmly in flank section
- incise uterine wall along greater curvature adjacent to the limb and towards the tip of the horn with scalpel blade or finger embryotomy (fetotomy) knife starting

below digits and extending to hock (or carpus in forelimb, if in posterior presentation)

- avoid incising maternal caruncles
- extend incision very carefully caudally until the limb can be exteriorized for application of obstetric chain or rope
- instruct assistant to maintain very gentle traction on rope/chain sufficient to maintain uterine wall in flank incision
- lengthen uterine incision to permit entry of hand into uterus to locate second limb, which is similarly exteriorised and a rope/chain applied
- manipulate head best by a thumb and finger grip in each orbit
- If very large fetus or uterine horn tip cannot be brought to flank wound for incision under direct vision, make blind incision over fetal extremity, which is then grasped and brought to flank in similar manner
- ensure that fetal traction is applied gently and in appropriate direction, usually initially upwards, and lengthen uterine incision, if required, with knife to avoid any tearing of uterine wall
- practise careful and slow fetal manipulation during extraction especially in cases of schistosoma reflexus, muscle contracture and emphysematous calves
- in case of gross fetal oversize or ankylosis the skin incision may, occasionally, require enlargement to 40 cm
- permit umbilical cord to rupture naturally

- after delivery hold uterine incision in flank wound and remove any loose protruding portions of placenta, leaving remainder in situ
- do not attempt to separate placenta from maternal caruncles
- with little or no assistance available, non-crushing uterine clamps (vulsellum forceps) can be used to hold uterus in position
- check for a second fetus in all cases
- intra-uterine medication is unnecessary
- while fetus is being revived and umbilical cord is checked, undertake uterine repair rapidly
- wash uterine wall with saline if needed
- close uterus with continuous Cushing suture, followed by continuous Lembert, or a modified Cushing (Utrecht uterine suture with buried knots)
- suture of uterine wall: start at caudal ventral commissure of wound if a single layer closure is intended or cranially if two layers are to be inserted. Suture material is either 5 or 6 metric PGA, polyglactin or 7 metric chromic catgut
- in some cases uterine contraction, tone and turgidity permit only simple apposition as sutures tear out when inversion is attempted Evacuation of fetal and other contaminating fluids from abdominal cavity is usually unnecessary. In case of grossly infected fluids, removal must be attempted by swabs and aspiration. Give intra-abdominal antibiotic or parenteral medication as required. Flank wound is closed in routine manner. Inject oxytocin (50 iu) parenterally to promote uterine contraction.

## Postoperative care

Continue parenteral antibiotics for five days especially if a dead calf was delivered, as prophylaxis against infection from retained placenta. Assess patients in severe shock and recumbency by following parameters: general appearance, rectal temperature, heart rate and character, colour of visible membranes, capillary refill time, and willingness to attempt to stand (. In severe cases not only will flunixin meglumine and massive antibiotic medication be required, but such animals also need large volumes of intravenous fluids (e.g. 25 litres).

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The calf should be given maternal colostrum as soon as possible by bottle (teat), or oesophageal feeder. The dam should be encouraged to stand to permit suckling as soon as possible. Placenta is usually released and discharged within 24 hours of surgery, and is a good prognostic sign. Cases with persistent infected discharge at this time should receive systemic antibiotics. Farmer should check rectal temperature and recall veterinarian if cow is febrile. Healing of the flank wound may occur by secondary intention as a result of intra-operative contamination, and excessive blood and fluid accumulation between suture layers. Death rate following caesarean section is low (approximately 10%, even lower if cows with poor prognosis are not operated), and is due to:

- Endotoxaemic Shock
- Chronic Severe Intra-Uterine Haemorrhage (Via Vulva)
- Septic Metritis And Peritonitis