

Calving detours: Cesarean section

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Abstract

Many times, it is not possible to deliver a calf vaginally. Veterinarians need to be familiar with the indications for a cesarean section (C-section), how to perform the surgery, and to move on to this option in a timely manner to achieve the best results. This paper will cover the indications for a C-section. There are several surgical approaches, but in general the left flank approach is the easiest to perform. Anesthesia is typically achieved with a paravertebral block of inverted "L". Once the abdomen is open, the uterus is brought to the incision. A uterine incision starting at the hock and extending to and around the hoof is made through which the calf is delivered. If the uterus cannot be brought to the incision, it can be opened in the abdomen with the aid of a letter opener. Severely contaminated calvings may require a special approach. Once the calf is delivered, the uterus is closed with an inverting pattern, and the body wall is closed in a standard manner. Knowing how to perform a C-section in the field will give the veterinarian another option when a calving detour is indicated.

Key words: bovine, dystocia, cesarean section, surgery

Résumé

Le vêlage d'un veau n'est pas toujours possible par voie vaginale. Les vétérinaires doivent être familiers avec les situations exigeants une césarienne et la procédure chirurgicale requise et aussi savoir quand passer à cette option en temps opportun pour obtenir les meilleurs résultats. Cet article couvrira les situations exigeant une césarienne. Il existe plusieurs approches chirurgicales mais en général l'approche par le flanc gauche est la plus facile à faire. L'anesthésie se fait typiquement à l'aide d'un bloc paravertébral en L inversé. Lorsque l'abdomen est ouvert, on extériorise l'utérus pour l'incision. On fait une incision utérine partant du sommet et s'étendant jusqu'au bas par laquelle sortira le veau. Si on ne peut pas extérioriser l'utérus pour l'incision, il peut être ouvert dans l'abdomen avec l'aide d'un coupe-papier. Les vêlages très contaminés peuvent nécessiter une approche spéciale. Lorsque le veau est sorti, l'utérus est fermé avec un patron inversé et la cavité corporelle est fermée de manière habituelle. Savoir comment faire une césarienne sur le terrain donnera au vétérinaire une autre option lorsqu'une voie alternative de vêlage s'impose.

Case Selection

One of the first things to consider with a cesarean section (C-section) is case selection. We all hope that when we are called out to a dystocia that it will end successfully with a live delivery, but when that is not possible we need to consider a calving detour. Common indications for a C-section are malpresentation that cannot be corrected, uterine torsion, a deformed calf or deformed maternal pelvis. The most common indication for a C-section is fetal-maternal mismatch, or a calf that is simply too big for the cow to deliver.

Veterinarians are persistent individuals, unwilling to give up (that is how you got through vet school, right?). We have all heard the horror stories of a veterinarian stuck doing a middle of the night, 5-hour dystocia. These often occur because despite the fact that the calf is presented incorrectly or is just too big, we get caught up in the notion that if we just reach a little further or pull a little harder we will get this baby delivered. Therefore, I would suggest you follow the 15 minute rule. That means you should work for 15 minutes to correct the problem, and if you have not made significant progress in that time, do something else. In other words, if it was a true breech and at the end of 15 minutes you have 1 leg up, great, keep working but if it is still a true breech in 15 minutes, move on to the C-section or fetotomy. Often vets, especially new graduates spend too much time trying to correct the dystocia and by the time they realize they need to do a C-section they are too exhausted to successfully perform the surgery and the cow is too stressed for a good outcome.

If the calf is anticipated to be large, veterinarians may opt for an elective C-section. Elective C-sections are usually easier, in that the uterus is not contracting on the calf. The calf is not in distress and it can be scheduled during regular working hours. The author has had good success in planning the procedure for about 2 days before the expected due date. Giving the cow 0.02 mg/lb (0.04 mg/kg) dexamethasone intramuscular 24 hours before the procedure helps to insure that the calf's lungs are mature. The owner can also give a dose of prostaglandin about 6 hours pre-operatively if desired.

Cows with dead or emphysematous calves have a poorer prognosis and are not ideal surgical candidates. It is nearly impossible to perform a C-section and not contaminate the cow's abdomen with some uterine fluid. With an emphysematous fetus, this increases the risk of peritonitis. A procedure is described later in this paper for performing a C-section on a rotten calf, but if possible, these are best dealt with by fetotomy.

Approaches

Surgical approaches for C-sections have been described for the high or low, left or right flank, the midline, and the paramedian. Most veterinarians prefer to do standard C-sections from the standing left flank approach, regardless of which horn the cow is pregnant in. Having the cow standing allows the surgeon to use gravity to help extract the calf and is more comfortable for the surgeon. The rumen holds the intestines in during the procedure, which often want to eviscerate when the calf is being pulled in a right approach. If the cow is weak or tired and you feel like she may not want to remain standing for the entire procedure, you are better off to cast her down and do the entire procedure down than to have her fall mid-surgery, and perhaps go down on the incision.

Performing the procedure in a chute in a heated facility with good lighting is ideal, but I have done many C-sections in barns. You do need good restraint. You can put the cow in a chute, an old stanchion or tie her to a post against a wall so she cannot swing around. A rope placed around the cow's neck and then tied very low back along the side of her can help prevent her swinging around. One of the "tools" I keep in my truck is a trouble light and extension cord for doing surgery in dark barns.

Anesthesia

In dairy cows, anesthesia of the paralumbar fossa is generally achieved with a proximal or distal paravertebral block. In beef cows, due to their heavy conditioning, I will usually perform an inverted "L" block. Just remember that you will need a vertical incision 14 to 18" (35.5 to 45.7 cm) long. I like to avoid line blocks, as they make the closure more difficult and contaminate the deeper muscle layers directly at the site of the incision, but they are the only real option for paramedian and midline approaches. If the cow is straining, perform a light epidural (1 mL/200 lb [91 kg] BW lidocaine). Unless the cow is so aggressive that she needs to be tranquilized for safety reasons, I try to avoid any types of systemic tranquilizer as this may cross over into the calf. Additionally, xylazine increases uterine tone making the uterus harder to manipulate. If systemic tranquilizers must be used, the calf should be reversed once it is delivered.

Preparation

The cow should have her tail tied away from the surgical site. The area is clipped from the backbone to the milk vein and from the first transverse process to behind the wing of the ileum for a flank approach. The area should then be scrubbed with soap to get the major dirt off. Once the dirty scrub is complete, the paralumbar fossa is blocked. The area should then be prepped with a 5-minute surgical scrub with sterile 4 x 4s, and then wiped with alcohol. Meanwhile, the

surgeon should lay out a sterile instrument pack. An old table, upside-down barrel or 2 bales of hay stacked up work well as an instrument table. Be sure to set the table out of the range of where the cow could knock it over, or contaminate it with feces. Also, be sure it is where other curious cows will not contaminate it.

In addition to instruments you will need at least 3 packages of #3 gut, a scalpel blade, a drape, sterile palpation sleeves, saline lavage, sterile 4 x 4s and #3 skin suture. The obstetrical handles and chains should be placed in a nearby bucket with water and disinfectant. The use of a drape helps if the surgeon needs to push the cow during surgery or needs somewhere to rest their hands.

I prefer to wear a gown and gloves when performing surgery, as I often find that shorter stature surgeons may need to extend their whole arm and shoulder into the incision. Further you may need to hug the calf to you to facilitate removal from the cow. You can wear a palpation sleeve protector or full OB suit under the surgery gown to prevent fetal fluids from soaking clear through the gown. This also helps to keep the surgeon warm in cold months.

Surgery

An incision is made starting a hand's width or about 4 inches (10 cm) below the transverse process and extending about 14 inches (35 cm) ventrally. The more contaminated the surgery, the lower the incision should be made. The muscle is incised layer by layer until the abdomen is entered. At this point the surgeon should don 2 sterile palpation sleeves. Palpate the uterus and identify the greater curvature. If it is an anterior presentation, grasp the rear foot and hock of the calf, driving with the hock, applying upward and lateral force to the hoof to try to bring the leg to the incision. Once at the incision, you can turn the leg horizontal to the incision and it should hold there. If the calf is presented posterior, grab a front leg and bring it to the incision. However this is more difficult, as the leg will want to bend.

A 14 to 16-inch (35.5 to 40.5 cm) incision is then made full thickness into the uterus. It is important to start at the hock or carpus and cut toward and around the hoof. If you start at the hoof, the calf's leg will pop out the hole and slide down the leg and you will not have a big enough incision through which to deliver the calf.

While it is preferable to exteriorize the uterus, you may not be able to, depending on the size of the calf and the surgeon. As long as the contents are healthy, you can open the uterus in the abdomen. This is best done with a hand-held letter opener. The point and blade of the letter opener can be guarded with the hand as you guide the instrument to the greater curvature. Once at the site of the incision, the point is poked through the uterine wall and the opener is slid along the wall until there is an incision adequate to deliver the calf. The hand guards the front of the opener, pushing any intestines away from the blade.

Place the obstetrical chains on the calf's legs with 2 half hitches. The chains can then be handed off to the farmer or assistants to pull the calf, while the surgeon monitors the size of the incision and helps assist the pull. The surgeon needs to monitor both the uterine incision and the skin incision, extending either as needed to avoid tears. Large incisions are much easier and less traumatic than tears to close. Once the calf is extracted, check for twins, trauma, and tears.

If the calf is emphysematous or the uterus is badly contaminated, the surgery should be done down. The incision is made in the left paramedian space or on the midline. Once the uterus is exteriorized, the cow's back legs are pulled up mid-surgery by an assistant so the cow is in dorsal recumbency, and the uterus is flopped to the side with the body wall incision above it. Use caution when manipulating the uterus, as it is often tissue-paper thin and may easily rupture. The calf can be extracted, the incision closed and thoroughly rinsed. The surgeon can then re-glove to replace the uterus and finish the surgery.

The uterus should be lifted out of the body incision and a vulsellum forceps or assistant should hold the top of the incision, closest to the uterine body and this is where the suture line should begin. The uterus is closed with #3 cat gut in an inverting Utrecht or guard rumen stitch pattern. The uterus is a very forgiving organ, so be sure that the stitches are placed in healthy tissue even if a considerable part of the uterus is inverted. Sutures will often tear out of weak, bruised or edematous tissue. Ignore the fetal membranes until the incision is closed enough that they will stay in the uterus when tucked in a 3 to 4 inch (7.6 to 10 cm) opening. Many new surgeons spend a lot of time trying to get fetal membranes to stay in the uterus when the opening is too large. If a large amount of membranes are hanging out of the uterus, they can be trimmed to decrease the weight and contamination.

Once closed, the uterus is rinsed with sterile saline to remove clots and avoid adhesions and replaced. Be especially careful that the ovary and fossa are free of clots. The abdomen may be flushed as well. The body wall is then closed in a standard manner. When closing the skin it is advisable to put a seroma stitch at the bottom of the incision if a continuous pattern is used. In this way, if the incision becomes infected it can be drained without having to try to retie the continuous suture.

Post Op Care

The cow should receive oxytocin following surgery and antibiotics if the surgery was performed in a barn. Antibiotics may be indicated for several days. Several low doses (20 to 40 IU) of oxytocin should be given in the 24 hr following surgery to facilitate involution. Additionally the cow may need pain medication, calcium, and fluids as supportive therapy. The sutures are removed in 10 to 14 days.

While we always hope for that easy live-birth calving, being prepared to take a calving detour and deliver the calf with a C-section. This often results in better outcomes and actually getting back to bed sooner.

References

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