

OB tips

Caitlin E. Wiley, DVM, MS, DACT

Clinical Assistant Professor, Iowa State University College of Veterinary Medicine, Ames, IA 50011, cwiley@iastate.edu
Corresponding author: Dr. Caitlin E. Wiley, cwiley@iastate.edu

Abstract

Whether you are a dairy or beef cattle veterinarian, there is 1 thing you will be guaranteed to do in your career... dystocias. Numerous factors impact the reproductive successes of a herd, beginning with the initial mating decisions to nutrition during gestation to calving areas, plus many others. As a professional, your expertise may be called upon at any of these points during the process on an individual-herd basis because you are familiar with the producer's goals and limitations. Over the last 20 years, management decisions in the various areas previously mentioned have resulted in an overall decrease in the number of dystocias. However, dystocias still occur, despite all the preparatory work to avoid them. Stocking your toolbox with proper equipment and knowledge will help you when the producer calls upon you for your expertise and assistance when the calving does not go as planned.

Key words: calving, dystocia, parturition,

Résumé

Que vous soyez un vétérinaire de bovins laitiers ou de boucherie, il y a une chose que vous allez faire inévitablement dans votre carrière... des dystocias. Plusieurs facteurs ont un impact sur le succès de reproduction dans le troupeau, en commençant par les décisions initiales d'accouplement jusqu'à l'alimentation durant la gestation, les aires de vêlage et bien d'autres. En tant que professionnel, on se fierà à votre expertise sur ces points durant le processus pour chaque troupeau car vous êtes familier avec les objectifs et les limites du producteur. Lors des vingt dernières années, les décisions de régie dans les nombreux domaines mentionnés plus tôt ont permis une diminution dans le nombre de dystocias. Néanmoins, les dystocias subsistent encore en dépit de tout le travail préparatoire fait pour les éviter. Remplir votre boîte à outils avec l'équipement et les connaissances appropriés va vous aider lorsque le producteur fait appel à votre expertise et votre assistance lorsque le vêlage ne se déroule pas comme prévu.

Introduction

Every cattle producer hopes their cows will calve uneventfully, unassisted, on time, and recover quickly. When plans go awry and assistance is necessary, cattle producers may attempt to intervene, but often rely on the skills of their

veterinarian to come to the rescue. As a cattle veterinarian, you are expected to be able to assess, assist, and resolve the dystocia in a timely manner with the hopes of having a live cow and calf in the end. Seems simple enough, right? The beef and dairy industries have worked to make improvements in breeding decisions, nutrition, record keeping, and preparation for calving seasons over the last few decades, resulting in reduced dystocias on numerous farms. However, as long as there are livestock living on this earth, you can guarantee there will still be dystocias. As a young, sprightly, recent graduate cattle veterinarian, dystocias can be daunting and sometimes unrewarding nightmares. And though it may not seem like rocket science to get a calf out of a cow, having the proper tools in your toolbox and utilizing the knowledge and skills you spent the last few years fine tuning can be greatly helpful in setting you up for success. The following proceedings are a review of techniques, tips, and lessons learned that may help you in your next dystocia.

Parturition

Parturition can be broken down into 3 stages. The first stage includes relaxation and dilation of the cervix as the calf rotates into position. These changes and movements of the calf often cause the dam to be restless. During this stage, the calf will enter the cervix and there should be protrusion and the eventual rupture of the allanotic sac. Stage 1 can last 2 to 8 hours. Stage 2 begins with rupturing of the allantoic sac (water bag). During this stage, the dam will have strong contractions with delivery of the fetus as a result. This stage generally lasts 30 minutes (cows) to 4 hours (heifers). Stage 3 labor consists of expulsion of the fetal membranes and commences once the fetus is out. For a more thorough review of normal parturition, please refer to *Current Therapy in Large Animal Theriogenology*.⁴

Any deviation or prolongation in progression of stage 1 or stage 2 labor is considered a dystocia. There are numerous causes of dystocia. Factors influencing dystocia include maternal causes, fetal causes, management, or any combination of these. Maternal causes include the most common occurrences of birth canal abnormalities, delayed or failed cervical dilation, and uterine inertia to name a few. Fetal causes include abnormal presentation, position, and/or posture; congenital abnormalities or fetal anomalies (monsters). Management causes can include mating decisions (i.e. not using proven calving-ease bulls on heifers); nutrition decisions resulting in over-conditioned or under-conditioned dams; and overcrowding of calving area.

Each producer will handle dystocia differently. Working to empower them to be able to assess the situation and determine if they can resolve the dystocia or not will hopefully save you a late night emergency call once in a while. Using a general guideline of progress every hour can help your clients determine points of intervention. This becomes especially important once they notice the water bag out or abdominal contractions occurring. If progress is not being made hourly towards delivery of the fetus, the cow needs to be examined.

The following is the general approach the author takes to handling dystocia and has been successful for not only dystocias, but routine calvings as well.

Restraint

Regardless of how nice or tame a producer claims their cow or heifer to be, she needs to be restrained for everyone's safety. Motherhood can bring out a whole new side to a cow, as their protective instincts engage with a newborn calf in sight. In ideal situations, a chute with sides that open is a gold standard in the opinion of the author. This allows options for manipulating the cow if she lies down during the extraction of the fetus, and getting her back standing afterwards. Additionally, if assistance is necessary for getting the calf to nurse, this allows safe restraint while having access to the udder.

If no chute is available, some type of head lock or restraint is necessary for your protection. Place a halter on the cow and tie her loosely with a slip knot through the head gate. By doing this, if she goes down during any part of the manipulation or extraction, the head restraint can be opened to prevent suffocation, and the head adjusted while still being tied securely to something. Sedation can be added; however, there should be some caution in administering too much and causing prolonged recumbency or potentially causing residual sedative effects to the calf. Two sedatives that the author has used with relative success in 'taking the wind out from beneath their wings' are acepromazine (10 to 25 mg, IM, depending on degree of aggression) or xylazine (5 to 15mg, IV, in the tail vein).

Examination

Once restrained, clean the cow's vulva before palpating using warm water with diluted chlorhexidine solution. Wearing sleeves is recommended, but is ultimately a personal preference and some practitioners find it hinders their ability to manipulate the fetus and apply OB chains. The author has found adding exam gloves over the sleeve, especially 1 size smaller than normal, to be effective in improving the sensitivity of palpation. Keep in mind there are numerous potential zoonotic diseases that can easily spread during parturition, and especially during abortions, therefore sleeves are your first line of defense and worth the effort and hassle. If the cow is lying in the mud, placing a feed sack or floor mat under her backend can help decrease contamination as you palpate and assist the delivery.

A vaginal exam will reveal more accurately cervical dilation, calf viability, and the presentation, position, and posture of the calf. Once this has been assessed, you can make your plan of attack to extract the calf. A rectal palpation is warranted if the cervix is not dilated or you question what you may be feeling. Uterine torsions are better diagnosed rectally to aid in determining the direction of the torsion and the proper direction of correction.

Lubrication will be your best friend in any dystocia. Unless you can 100% guarantee there will be no cesarean section performed or uterine tear occurring, avoid using a polyethylene polymer-based lube (i.e J-Lube). If this lubrication gets into the abdominal cavity, it is known to cause fatal peritonitis.^{1,2} In the author's opinion, the best lubrication for palpation and dystocias is a carboxymethylcellulose based lubricant. In any dystocia scenario, you can never over-apply lubrication!

The second key to success is, if you have 2 arms, use 2 arms! You may be able to reach or manipulate the calf better with 1 arm over the other. Heifers, especially, have a tight vaginal canal and pelvis, and this is the area where the calf often gets caught on extraction. Using both arms, you can stretch out the vaginal canal, and prevent tears and ease delivery. Apply pressure with both arms to the lateral aspects of the vaginal canal for a couple of minutes to stretch the canal. If the calf can fit through the bony pelvis, you can get it through the vaginal canal. The more time spent dilating the vaginal canal, the lower the incidence of vaginal tears, and the easier it is to extract the fetus.

Palpate the fetus and determine its presentation, position, and posture. Determining calf presentation is key to devising a plan of attack to get it out. A normal calf presentation would be anterior (head first), dorso-sacral (calf dorsum relative to cow's sacrum) with the head and front limbs extended out (Figure 1). Presentation involves the direction of the

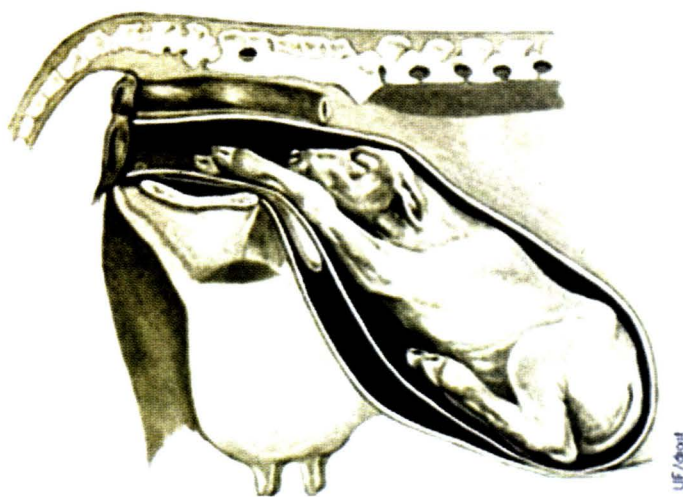


Figure 1. Normal presentation, position, posture of calf at time of delivery. Drost M. Normal presentation, position, posture. University of Florida. www.drostproject.org.

fetal spine relative to the dam spine. Position describes the fetal dorsum relative to the area of the dam pelvis (sacrum, pubis, ilial, etc.). Posture describes the fetal appendages in relation to the fetal body.⁵ The Bovine Reproduction textbook has a thorough review of these 3 Ps,⁵ and additionally Figure 2 illustrates common abnormal presentations. Commonly, producers may struggle to decipher front limbs from hind limbs or which limbs go to which calf in the case of twins. Remembering how the front and hind limbs flex and being able to trace each one back to the body is essential. This may take practice on your part as well, depending on your comfort and experience level. If in doubt, take a look at a calf nearby to visualize the joints on their limbs, or simply look at the dam you are working on.

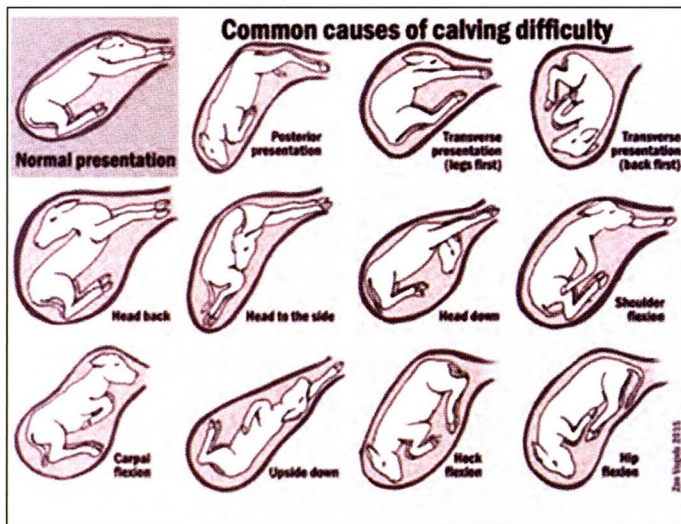


Figure 2. Visualization of various calf malpresentations at time of delivery. Volgels Z. Common causes of calving difficulty, 2015.

Manual extraction

The most common cause of dystocia is fetal-maternal mismatch and heifers have increased incidence.³ To determine if the calf is truly going to fit, the calf should be engaged in the pelvis so assessment of shoulder or hip width can be made. To get a good idea, pull on the legs presented, front or hind, until they are through the pelvis, then the author will take both arms in and palpate around the calf, through the pelvis. As the author's arms pass by the ilial wings of the cow, if they deviate laterally to get around the calf (calf shoulders/hips are bigger than cow pelvis), the calf will not fit. Another sign the calf may be too large is the legs crisscrossing as they enter through the pelvis and vaginal canal. A calf presenting posterior should fit if its hocks make it out of the vulva and there is still room between the hips of the calf and the dam's internal pelvis. If the calf is too large, the plan needs to change to either a cesarean section or fetotomy, depending on calf viability and cow value.

Epidurals can be very beneficial for the cow as you work to manipulate the calf and extract it vaginally. Approximately 4 to 6 mLs lidocaine (2%) in the epidural space should provide nerve desensitization (especially at the level of the cervix) for 45 to 60 minutes. The cow will often stand better and reduce straining against you with an epidural. This can be administered at any point during the event. The author usually assesses the calf and makes a plan before administering the epidural.

During manual extraction, the author places an OB chain on whatever limb(s) can be accessed. Even if the calf needs to be retropulsed back for further manipulation and you do not need the limb at the present time, it is much easier to retrieve it if there is already a chain around it. In the author's OB toolbox there are 3 long (60 inches; 152 cm) chains and 2 handles. You may not always need the extra length, but it can be a lifesaver when you do. Chains should be placed with a loop above the fetlock and a half-hitch placement below the fetlock prior to applying pulling pressure (Figure 3). In anterior presentation, the head may warrant a chain if it is not resting between the front limbs. Head snares can be great, as they are preformed and slip over the poll and ears easily. The author prefers to use a chain in the same manner, making a large loop prior to placing it over the poll, behind the ears, and cinching it up in the mouth (Figure 4); hence the need for having 3 long chains. Do not use the head chain as a primary pulling point; only the limbs should be used. The head snare/chain is to assist in keeping it in its correct posture during extraction.



Figure 3. Chain placement above and below fetlock.



Figure 4. Chain placement around head and into mouth. Also referred to as a 'war bridle'.

Obviously there are cases where there are no hooves within reach (breach or anterior presentation with flexed shoulders). In these scenarios, take the end of the chain in and place it over the dorsal/lateral aspect of whatever limb you can get a hold of. Then palpate under that limb (medial, ventral aspect; in the inguinal area or armpit) and pull the end of the chain through and back out to make your loop. After making the loop with the 2 ends outside of the uterus, cinch it down near a joint. Now you have a handle on that limb and can work to retropulse the calf and get that limb manipulated over the pelvic brim. As you progress in manipulating the retracted limb, move the chain down the limb towards the next joint. In the author's experience, pulling on the chain while retropulsing the calf back has been successful as long as you protect the calf's hooves as you pull them over the brim of the dam's pelvis.

As you work diligently to get the calf extracted, monitor your progression. Every 15 minutes you should be making progress. If not, change your approach. Stop and reassess the situation to determine what you could change. If limbs are out and force is being applied, there should be progression in increasing visibility of the calf. If not, you need to reach in, around the calf, to assess what is hindering progress. As the calf pelvis makes it to the cow pelvis, rotate the calf 90 degrees to align the widest part of the calf with the widest part of the cow's pelvis to prevent hip lock (Figure 5). Epinephrine (1:1000) is a tocolytic and can aid in relaxation of the uterus and allow increased room for manipulation. Administer 6 to 10 mL epinephrine IM and then allow 2 to 3 minutes for full effect before palpating and manipulating.

How much pressure/force is too much? Historically, it was taught to apply the force of 2 strong men/3 strong women on the calf. In general, 1 person on each limb with

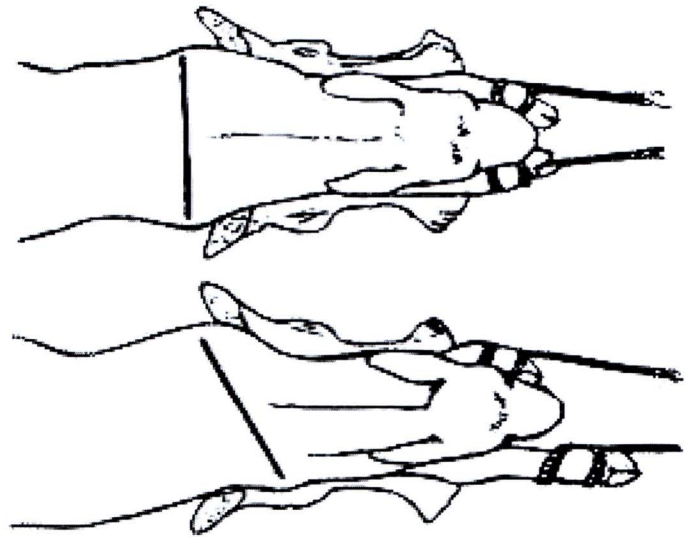


Figure 5. Normal presentation, position, posture with depiction of alternating pressure on each limb to 'walk' calf out vaginally. Ltd. BVLH. Shoulder position, 2015. Available at: <https://bvlh.ca/2015/2012/2031/calving-troubleshooting-dystocia/>.

adequate strength is acceptable if it is going to fit vaginally. It is important to apply force when the cow has contractions. When the cow rests in between contractions, keep tension on the chains but wait to pull or add additional pressure. Working with the cow generally has the best outcome for the cow and calf. An anterior-presenting calf does not have to be extracted at lightning speed. Slow, steady progress is ideal. In posterior-presenting calves, there is more urgency. As the calf pelvis enters the cow pelvis, the umbilicus will be occluded and/or break, eliminating oxygen supply to the calf. Once the calf is to this point, it becomes more time sensitive as the calf is trying to breathe in the uterus.

A calf-jack (fetal extractor) can be a valuable piece of equipment to have available. Two strong people can apply upwards of 500 lb (227 kg) of pressure. A calf-jack can apply at least 1000 lb (454 kg) of pressure, which can easily break calf bones, dislocate calf joints, and cause significant damage to the cow if used incorrectly. The calf-jack should not be utilized for the purpose of needing more power in pulling. It should be used as a relief tool for you, by holding the calf steady while you wait for another contraction or to re-evaluate progression within the vaginal canal. There are several types of calf-jacks available. The author prefers the type with a double ratchet setup with 2 hooks, alternating pressure on each limb (Figure 6). This ratcheting will 'walk' the calf out. Additionally, there is usually a third hook for the head chain that helps keep it in place and progressing with the limbs. The author has found the best implementation of the calf-jack is when the cow is standing and the chains are properly placed on the calf limbs. Once the apparatus is on correctly, ratchet a couple times until taut, then slow downward pressure on the bar for 20 to 30 seconds during a contraction. After added pressure during the contraction,

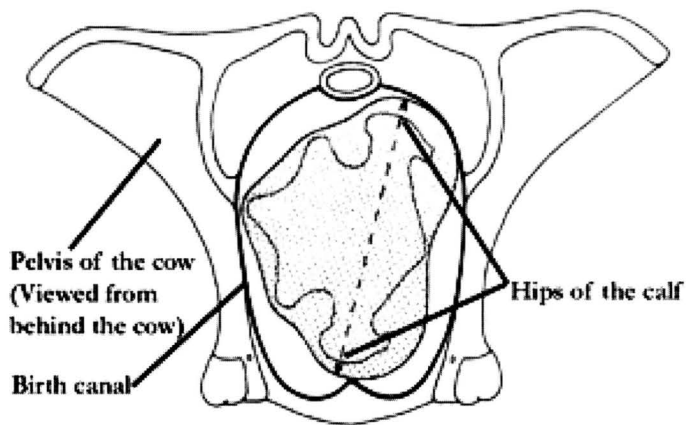


Figure 6. Image depicting rotation of calf pelvis to enter through the widest area of the cow's pelvis to prevent hip-lock. Ltd. BVLH. Pelvis position, 2015. Available at: <https://bvlh.ca/2015/2012/2031/calving-troubleshooting-dystocia/>.

bring the bar back to perpendicular to cow and repeat. This allows pressure applied to the calf followed by stretching of the vaginal canal as the calf progresses out.

Come-along and rope pulleys are common alternatives to calf jacks. They can be utilized in the same manner as a calf jack by attaching 1 end to a solid, immobile structure behind the cow. The same principle of slow ratcheting and rest intervals applies. Regardless of the device, if you are not making progress of increasing visibility of the calf, you need to palpate and determine what needs to be adjusted accordingly to extract the calf safely.

Post extraction

Once the calf is out, get it lying sternal with the front limbs extended or flexed underneath it. Stimulate it to breathe by rubbing vigorously on its rib cage or sticking a clean piece of straw (atraumatic object) into its nostrils. Clean debris out of its nostrils and mouth as necessary. A general physical

should include evaluating the umbilicus for excessive bleeding, ensuring there is a patent anus, absence of a cleft palate, and evaluating the limbs that were used to extract calf for any trauma.

Evaluate the cow after the calf has been assessed and stable. Palpate intrauterine for another calf and any tears, and then course the vaginal canal for any tears as your hand exits.

Conclusion

Each dystocia can present differently, but the goal is a live cow and calf. While many dystocias do not end with these positive results, experience and learning from each dystocia you are called to will help you become more efficient and confident in the next one. The tips and suggestions presented in these proceedings are the result of living and learning from each dystocia the author has experienced. Your clients rely on your expertise and commitment to doing the best you can under the circumstance given. Hopefully the advice provided in these proceedings will enable you to become more confident and successful in extracting a calf in a dystocia setting.

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