



Fetomaternal Disproportion as a cause of Dystocia in Bovines and its Obstetrical Management

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Abstract

Fetomaternal disproportion (FMD) is one of the leading causes of dystocia in cattle and buffaloes, primarily due to oversized fetus relative to maternal pelvic dimension. Early diagnosis and timely obstetrical intervention are crucial to save the dam and calf. This article describes practical approaches for management of FMD including per-vaginal forced extraction, fetotomy and caesarean section with their indications, techniques and clinical considerations for field veterinarians.

Keywords: Dystocia, Fetomaternal disproportion, Forced extraction, Fetotomy, Caesarean section

Introduction

Dystocia due to fetomaternal disproportion is commonly encountered in bovines, especially in primiparous heifers bred with exotic germplasm and in cases of prolonged gestation. FMD may be either due to fetal oversize (absolute oversize) or due to small maternal pelvis (relative oversize). Fetal oversize is associated with genetic factors, male calf, prolonged gestation, and maternal overfeeding during pregnancy, while maternal factors include immaturity, pelvic deformity and inadequate pelvic development. Successful management depends on assessment of fetal viability, degree of disproportion, status of birth canal, and time elapsed since onset of second stage labour. The three major options for delivery of an oversized fetus are per-vaginal forced extraction, fetotomy and caesarean section. Selection of method requires clinical judgment to minimize dam injury and calf mortality.

1. Per-vaginal forced extraction

Forced extraction is defined as delivery of fetus by application of external traction when disproportion is mild to moderate. It is applicable in both anterior and posterior presentations, provided the fetus is in normal posture and birth canal is adequately lubricated and dilated. Epidural anaesthesia (2%

Lignocaine, 3-5 ml) is mandatory to abolish straining and to facilitate manipulation.

1.1 Anterior presentation: Anterior presentation is most frequent in bovines. In cases of mild FMD with live fetus, forced extraction can be attempted. Obstetrical chains or nylon ropes are applied above the fetlock joint with a half-hitch below the fetlock to avoid slipping and to prevent fracture. A head snare or war-bridle is applied for control of head. Copious lubrication with Carboxy Methyl Cellulose (CMC) or obstetrical gel is essential to reduce friction and birth canal trauma (Noakes et al., 2001). Traction should be applied synchronously with maternal straining in a downward and slightly lateral direction, alternating on limbs.

1.2 Posterior presentation: Posterior presentation invariably leads to dystocia due to early rupture of umbilical cord and resultant fetal hypoxia (Purohit, 2011; Jackson, 2004). Hence delivery should be expedited. Obstetrical chains are applied on hind limbs above fetlock similar to forelimbs. The fetus should be slightly rotated to dorso-ileal position before engaging into pelvis to facilitate passage of hip joints. Once hips cross the pelvic brim, the fetus is returned to dorso-sacral position and continuous traction is applied to complete delivery quickly. Forced extraction is contraindicated in absolute oversize, incomplete

cervical dilatation, uncorrected postural abnormalities and emphysematous fetus.

2. Fetotomy

Fetotomy is the reduction of fetal size by intra-vaginal dissection and removal of fetal parts when the fetus is dead and cannot be delivered per-vaginum. It is indicated in dead oversized fetus, to avoid caesarean section and to preserve future fertility of dam (Roberts, 2004). The procedure can be performed in lateral recumbency, although standing position is considered unsafe for operator. To prevent uterine contractions and rupture, tocolytics like Clenbuterol (300 mcg IV) may be used (Jackson, 2004).

Methods of fetotomy

Two methods are described Subcutaneous (intra-fetal) and Percutaneous (extra-fetal) fetotomy. Subcutaneous method requires skill, physical strength and more time, with higher risk to dam and operator. Percutaneous fetotomy using Thygesen's fetotome is more popular and practical (Noakes et al., 2001). It can be partial or complete. In FMD with absolute oversize, complete fetotomy is often required. In anterior presentation, generally 6 cuts are needed: removal of both forelimbs, head, and division of thorax, while in posterior presentation, removal of hind limbs and evisceration is performed.

Adequate epidural analgesia, profuse lubrication and assistance of 2 persons are essential. Strict asepsis should be maintained. After completion, vagina and uterus must be thoroughly examined for lacerations. Uterine lavage with warm normal saline and mild antiseptic followed by CMC instillation prevents adhesions. Oxytocin (40-50 IU IM) is administered to control bleeding and to prevent secondary uterine inertia.

3. Caesarean section

Caesarean section (laparohysterotomy) is the method of choice for delivery of live oversized fetus when forced extraction fails and fetotomy is not indicated, and also for complicated FMD cases (Noakes et al., 2001). Though it provides best calf survival, it is a major abdominal surgery with risk of contamination and peritonitis (Kolkman et al., 2009). Selection of surgical approach depends on dam condition, recumbency and surgeon preference.

Post-operatively, broad spectrum antibiotics, anti-inflammatory, antihistaminic, fluid therapy and ecbolics are essential.

Sl. No.	Surgical methods	Procedure to perform
1	Standing left para lumbar approach	Most commonly used. Vertical incision 10 cm ventral to lumbar transverse processes, 35-40 cm long. Better exteriorization of uterus, less contamination.
2	Standing right para lumbar approach	Similar to left side but difficulty in retaining intestines. Rarely used.
3	Standing left oblique approach	Incision starts 8-10 cm ventral and cranial to tuber-coxae, directed caudo-dorsally to cranio-ventrally at 45° angle up to 3-5 cm caudal to last rib.
4	Recumbent left para lumbar approach	More ventral and oblique incision at level of hock. Exteriorization difficult as gravid uterus falls away from incision. Used in recumbent / debilitated animal.
5	Recumbent right para lumbar approach	Similar to left recumbent approach, rarely applied.
6	Mid ventral approach	Incision from in front of mammary vein up to xiphoid (30-40 cm). Good for emphysematous fetus but high risk of herniation and contamination.
7	Para median approach	Incision 5-6 cm lateral to midline or midway between midline and mammary vein. Can be done on either side.
8	Ventro lateral approach	Incision starts 5-6 cm away from umbilicus extending caudo-dorsally towards inguinal region.

Conclusion

Fetomaternal disproportion is an important cause of dystocia requiring immediate obstetrical decision. Mild disproportion with live calf can be managed by judicious forced extraction with proper lubrication and epidural anaesthesia. Dead oversized fetus is best managed by percutaneous fetotomy to avoid laparotomy. Caesarean section remains the gold standard for absolute oversize with live calf and for valuable dams. Practical knowledge of all three techniques is essential for field veterinarians to reduce dam and calf mortality and to preserve future fertility.

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