

The Use of Fetotomy in Large Animal Practice

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A primitive form of fetotomy was recorded in history as early as the fourth century B.C. and again in the first century A.D. However, centuries passed before a practical form of fetotomy was developed. The dismemberment of the fetus is often erroneously referred to as an embryotomy. It is not dismemberment or dissection of an embryo but that of a fetus, hence, the term *fetotomy* is the more correct term.

The modern fetotome developed by Thygesen, along with the introduction of epidural anesthesia by Benesch in 1926, was the emphasis needed for the development of a quick and efficient technique of percutaneous fetotomy. Previous to this time subcutaneous fetotomy was quite extensively used during the eighteenth and nineteenth centuries. During the nineteenth century several texts appeared in the Netherlands describing this technique.

The Dutch further refined the art of fetotomy. The instrument of Thygesen was modified into a more efficient one by Professor Dr. van der Kaay. In addition to perfecting the instrument, he also modified and adapted new techniques. Van der Kaay's successor was Professor Dr. C. H. W. de Bois. De Bois further modified fetotomy technique as is now being reported in the manual by de Bois and Bierschwal, "The Technique of Fetotomy in Large Animals." During my sabbatical year in the Netherlands I worked with Professor de Bois in his veterinary clinic for obstetrics and gynecologists where he taught me the technique of modern fetotomy. To give you an idea as to the efficiency of this method, I witnessed a complete fetotomy (seven distinct surgical cuts with the fetotome) in 21 minutes. Dr. Les Ball, who just returned for a sabbatical (1976), witnessed a complete fetotomy in 16 minutes. This is absolutely unbelievable until you witness it personally.

Fetotomy was also quite popular in the United States prior to the development of the cesarean section. As surgical techniques improved, the technique of fetotomy has almost been totally abandoned in our veterinary schools. However, if you investigate obstetrics as it is practiced, you will find that fetotomy is still a technique that is quite popular. The major reasons for the decline in interest in fetotomy have been due to poorly adapted and designed instruments. In addition, the techniques as taught and described were such that it was an arduous, time-consuming task. Fetotomy has assumed its place in many practices as largely a last resort

measure used only after extensive attempts at forced extraction and manipulation. At the University of Utrecht, The Netherlands, the purpose of fetotomy is to achieve sufficient reduction of fetal size to permit safe extraction, thereby avoiding the risk of stress and injury caused by excessive extraction and manipulation. It should be noted that at Utrecht far more cesarean sections are performed than fetotomies. If the fetus is alive, a cesarean section is performed; however, if the fetus is dead, almost invariably the fetotomy will be started immediately. It is my firm conviction, and has been confirmed by others, that fetotomy has its proper place in veterinary obstetrics and should be included in the curriculum of every veterinary student who contemplates engaging in a practice which includes care of the cow or the mare. This is not to negate the importance of cesarean section in veterinary practice. However, there has been a tendency to rely totally on cesarean section as the approach to managing dystocias which cannot be relieved by manipulation or forced extraction. Should not the complete veterinary obstetrician be capable of performing both the cesarean and fetotomy?

Certainly in most cases the cesarean section is the method of choice if the fetus is alive and viable. However, if the fetus is dead, fetotomy should be given first consideration. The more prolonged the dam's labor, the greater the advantage of fetotomy. An added advantage of fetotomy is that the fertility of the dam is less likely to be impaired by this procedure.

Fetotomy should not be considered as a substitute for cesarean section. Both have a place in veterinary practice, the choice of method of individual cases being governed by the circumstances.

Indications for Fetotomy

A common fault in veterinary obstetrics is the application of too great and too prolonged an extractive force before the decision is made to perform a fetotomy or cesarean section. After examination has revealed the presence of a dead fetus, the fetotomy should be initiated immediately. The practice of exerting excessive mechanical extractive force in order to avoid performing either cesarean section or fetotomy can best be described as the approach of a "calf-puller." It is certainly not the method of a trained veterinary obstetrician.

It should be pointed out that many dystocias require only a partial dismemberment of fetus (for example, removal of the head and one limb) to make possible a safe and quick delivery. By application of the techniques of modern fetotomy the problem of the partially delivered fetus often can be alleviated more quickly than with a properly performed cesarean section. "Hiplock" in the anterior presentation is the best example of the type of dystocia which is best handled by fetotomy. Forms of abnormal fetal posture which cannot be safely corrected by manipulation can often be quickly alleviated by the fetotomy technique.

The advantages of the correctly performed fetotomy are: 1) Rapid reduction in the size of the fetus facilitating safe delivery per vagina. 2) Exposure of the dam to major abdominal surgery is avoided. 3) The dam is spared inhumane treatment and possible trauma associated with application of excessive force from extractive devices (fetal extractures). 4) Less aftercare is generally required. 5) Recovery time is shorter. 6) The general condition of the dam tends to remain more stable than after cesarean section. 7) Last but not least, the monetary return is equal to, and sometimes should be more than, that required by cesarean section.

Some of the commonly cited disadvantages of fetotomy are: 1) It requires more time to perform than the cesarean. (With the experienced obstetrician and improvement of his skill, this disadvantage can quickly be overcome.) 2) It may be exhausting to the obstetrician. (This is not always true. Again, skill of the operator is the most important factor.) 3) The obstetrician is subject to the risk of wound from the instrument or from a sharp fragment of fetal bone. (By application of proper techniques and adequate lubrication, this risk is minimal at the most.) 4) It is dangerous to the dam. (This is true only when improper technique and poorly designed instruments are used.)

During my stay in Utrecht all obstetrical cases were hospitalized. It was possible to observe and compare the postdystocia recovery periods of patients following both cesarean and fetotomy. In a vast majority of cases, recovery from fetotomy was more rapid and more complete than from cesarean section.

Most of the unsatisfactory results of fetotomy are attributable to the operator's lack of experience, to poorly designed instruments, to improper fetotomy techniques, to the use of fetotomy only as the last resort. By utilizing proper fetotomy techniques, rather than that of applying excessive, unsafe, extractive force to deliver a dead fetus, the obstetrician can

improve his skill with the fetotome. He then has the confidence and skill required to cope successfully with the truly difficult dystocias—many formerly regarded as hopeless.

Fetotomy Instruments Required

A large number of instruments have been designed for use in fetotomy. Some are practical, others quite inadequate and unsafe. The instruments listed here are described in the manual and are based on the use of the Utrecht model fetotome. Additional instruments are needed for application of a good fetotomy technique. Instruments required are as follows: 1) Utrecht model fetotome (imported by several companies and being manufactured in the United States). To be successful the head of this instrument must be of extreme hardened metal to withstand the friction of saw wire in direct contact with the head. 2) Wire saw handles. 3) Fetotome threader. 4) A Kray hook. 5) Saw wire introducer. These instruments, as I indicated, are now available and it is thought that a United States manufacturer will soon be in production with a good fetotome.

Lubrication

Perfection in fetotomy depends upon four factors: 1) technical knowledge, 2) adequate training and experience, 3) correctly designed instruments, and 4) proper lubrication. The importance of proper lubrication cannot be overemphasized; it is a major factor in determining the outcome of a fetotomy. Insufficient lubrication or use of an inadequate lubricant can be, and often is, cause of failure. A suitable lubricant provides protection to the soft tissue of the genital tract of the dam, and protection to the hands and arms of the obstetrician. White vaseline (petroleum jelly) combined with ten percent boric acid is used in the Clinic of Utrecht. This compound, Borosalve, must be blended in a pharmaceutical blender. (In the United States this lubricant can be obtained from some pharmaceutical companies.) The very characteristic of tenacity which makes "Borosalve" so desirable for obstetrical procedures also makes it difficult to remove after use. However, the protective values far surpass the inconvenience of removal. A warm-to-hot detergent solution containing any household detergent that is safe for the skin may be used to scrub instruments, protective clothing, and the arms of the obstetrician. Water-soluble lubricants are not desirable because of the rapid loss of lubricating qualities in the presence of fluids.

A detailed description for fetotomy is found in the manual, "The Technique of Fetotomy in Large Animals."