A RAPID TECHNIQUE FOR OBSERVING THE REPRODUCTIVE TRACT OF LIVING EWES

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THE Sheep Laparotomy Cradle as described by Lamond and Urquhart (1961) in conjunction with a local anesthetic greatly facilitates laparotomies for observations of the reproductive tract. However, large ewes are extremely difficult to raise high enough on the cradle for convenient observations and they are not adequately restrained. The position of the head and shoulders also interferes with access for surgery.

The common technique of exteriorizing the reproductive organs through a mid-ventral incision results in a variable amount of traumatization, contamination and dehydration which appears to increase the incidence and degree of adhesions. A technique for observing the reproductive tract inside the body cavity should materially reduce this problem. Lamond and Holmes (1965) describe the use of an endoscope for ovarian examination of the cow.

This paper describes a laparotomy technique using a plastic speculum for rapidly and accurately observing ovarian structures within the peritoneal cavity of the ewe. The technique involves the use of a new laparotomy restraining device (LRD). This device is also described. The LRD was developed to reduce labor and to make the entire operation more efficient.

Experimental

Design and Use of the LRD. The LRD was constructed to assume either (1) a loading and unloading position or (2) an operating position. The first is a supine position (figure 1). In this position, the sheep may be easily loaded or unloaded by one person. However, for speed, one man working on each end is more efficient. The hind legs are forced down and then up into the hooks at the posterior end of the device. Straps placed behind the feet prevent the ewe from kicking loose. The head is placed on the support at the anterior end and the front feet forced down and then up into curved metal hooks on either side of the head. No further fastening is required. The nature of the construction permits the ewe to be secured almost as rapidly as she can be laid on the LRD.

Next the LRD is raised to the elevated or operating position (figure 2). In the operating position, the weight of the sheep is on the back, shoulders and hind legs. The viscera settle forward, leaving the reproductive tract relatively isolated in the well-fasted animal. Ewes have been left in the elevated position for over an hour with no ill effects. Dimensional drawings are shown in figure 3.

Surgical Procedure. In the operating position, the surgical site is sheared with electrical sheep shears, scrubbed, disinfected, covered with a plastic shroud and injected with a local anesthetic. By using three or four LRD's, ewes can be prepared for surgery while another is being operated on without loss of time to the surgeon.

The operator makes a mid-line or mid-lateral incision just anterior to the udder and just large enough to permit two fingers of the left hand to enter the peritoneal cavity. He then grasps the tip of one uterine horn, preferably the left, between his fingers, brings it to the exterior and holds it in the posterior end of the incision. A thin-walled plastic speculum (figure 4) which has an outside diameter of 23 mm. at the small end is inserted anteriorly to the horn tip. The uterine horn tip and the speculum are then grasped together with the left hand. The operator, wearing a headlamp, then directs the speculum to the left ovary, which is very easily found because the uterus is held above the speculum and the ovary is drawn slightly toward the incision. The tip of the speculum is placed over the ovary. If the ovary has a pendulous attachment, a slight rotation of the speculum is all that is necessary to see all sides of the ovary. If it is closely attached, a spoon (figure 4) held in the right hand is

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inserted through the speculum and is used to manipulate the ovary. The authors routinely use the spoon on all observations. While continuing to hold the left uterine horn tip the right ovary is located in its characteristic position and observed in the same way. Slight difficulty, sometimes encountered in locating the right ovary, decreases with experience. Occasionally, with a very motile uterus, the ovary may be on the ventral side of the uterus and is difficult to observe. When this occurs, it may be necessary to either reverse the position of the uterine tip and speculum or drop the left horn tip back into the peritoneal cavity and grasp the right horn tip.

The body wall including all fascia and muscle layers is sutured together using a continuous stitch with synthetic surgical suture “Vetafil Bengen” (heavy, 0.40 mm.) which gives no tissue reaction. An antibiotic powder is placed in the wound and the skin is sutured with automatic skin clips, “Autoclip”. It is not necessary to remove the skin clips later. Each ewe is injected with antibiotic, although this may not be necessary. A fast drying astringent antiseptic wound dressing is sprayed on the wound after closure. The shrouds are rinsed in a disinfectant soap solution between animals. The surgeons sit on low stools with rollers which are easily rolled from one animal to the next. The ewes are in such a position that the operator may sit in a relatively comfortable position.

Post-operative recovery is extremely rapid. The ewes are usually retained in a holding pen for an hour or two and observed for post-operative complications, such as hemorrhage, before being turned out. Most ewes will start eating as soon as feed is made available.

Results

Two experienced operators with four assistants to handle sheep, prepare the surgical site, record data and dress the wounds, have consistently averaged over 30 laparotomies per hr. This includes recording ovarian structures, abnormalities and, in bred ewes, the number of pregnancies. A total of 1,032 laparotomies and observations have been performed using these devices. Observations on ovulation rate and pregnancy of 224 ewes previously laparotomized and bred 25 to 30 days earlier were made in 6.5 hr., for an average of 34.5 ewes per hr.

Ovarian observations become more difficult in the ewe as pregnancy advances. The membranes and fluids increase the weight and volume of the uterus making it more difficult to locate the ovaries. However, several ewes have been successfully observed at about 46 days of gestation.

Of the 1,032 laparotomies using the above described techniques, one ewe died as a result of surgery. This was apparently due to faulty suturing. In addition, on subsequent observations three ewes had small hernias at the site of the old incision. These were easily repaired by surgery.

Three-hundred-forty-four ewes were observed for the incidence of adhesions 34 days subsequent to the first laparotomy. The greater omentum had adhered to a small area of the uterus in four ewes. There were slight adhesions on the left ovary of one ewe. None of the 14 ewes laparotomized three times had
any observed adhesions associated with the reproductive tract at the time of the last laparotomy.

Discussion

The omentum frequently adheres to the body wall at the site of the incision. When a new incision is made near the site of the first one, it may be difficult to locate the uterus. This is usually because the omentum is held rather securely in a posterior position by adhesion to the body wall. When such adhesions occur, the omentum obstructs access to the uterus. The problem is increased as fat deposition in the omentum increases. The adhesion should be removed to allow the omentum to
An effort is made to avoid cutting any blood vessels of significant size. However, when this occurs, they are tied off at the time of closure. Occasionally some hemorrhaging goes unnoticed and may produce a large clot between the skin and body wall at the incision site. Although no deaths have occurred from this, clotting results in slower healing and inconvenience at the subsequent laparotomy.

Summary

A laparotomy technique using a plastic speculum for rapidly and accurately observing ovarian structures within the peritoneal cavity of the ewe is described. This technique is used in conjunction with a new laparotomy restraining device (LRD) developed to reduce labor and to make the entire operation more efficient. This method is rapid and accurate, and reduces traumatization, dehydration and bacterial contamination of the reproductive tract. This improved technique appears to reduce adhesions to a negligible level and makes practical the selection of ewes on the basis of ovulation rate.

Literature Cited