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BEGIN TRANSCRIPTION

[Barking]

Narrator: The canine OHE.

Narrator: The dog is clipped cranially at the rib margins to the caudal extent of the abdomen. The cranial surgical towel is placed cranial to the umbilicus, caudal surgical towel at the pubis, lateral towels just inside the nipple line. The surgical drape is placed and the incision is planned. For an adult dog, the incision should begin just caudal to the umbilicus and extend about a third of the way down the abdomen. For dogs less than twelve weeks of age, the middle third of the abdomen is appropriate. A single clean cut is made through the skin. The subcutaneous tissues are then gently incised using the bevel of the blade.

Narrator: As you approach the abdominal wall, it is important to use care to avoid inadvertently incising the rectus sheath. The rectus sheath and linea are now visible. The linea extended caudally from the umbilicus along midline, the rectus sheath is on either side of the linea. Thumb forceps are used to grasp the linea and lift in order to make a stab incision. The abdominal wall is lifted in order to protect the abdominal contents below. Once the stab incision is made, a groove director is inserted to extend the abdominal wall incision. The groove director is positioned to maintain the incision on midline. The groove director is lifted to ensure that no omentum or mesentery is entrapped between the abdominal wall and the groove director.

Narrator: To facilitate closure, it is desirable that the abdominal wall incision be slightly smaller than the subcutaneous and skin incisions. Once the abdominal wall incision is opened the abdominal contents below should be visible. If the stab incision is not on midline or the rectus sheath is inadvertently incised a paramedian incision will need to be made.

Narrator: The goal of the paramedian incision is to bluntly dissect muscle fibers in order to decrease hemorrhage during surgery and post-operative pain for the animal. The skin and subcutaneous tissues are incised. In this case it becomes apparent that an inadvertent incision has been made into the rectus sheath. Therefore, a paramedian incision is required as we are

committed to any defect we make in the body wall. The rectus sheath is stabilized with the thumb forceps and a blade is used to incise the rectus sheath. Only the rectus sheath should be incised, not the muscle below. A straight clamp will be inserted into the muscle to spread the fibers along their longitudinal axis. The clamp is inserted into the muscle and then directed cranially and caudally in order to split the muscle. Once a large enough opening is achieved, it is often desirable to use digital tearing of the muscle. When the muscle has been torn for the length of the incision, the perineum is visible. The perineum will be grasped with the thumb forceps and lifted, and a stab incision is made into the abdomen. A groove director is then inserted to extend the incision. Once the perineum is incised, the abdominal contents below will be visible.

Narrator: The next step will be to use the spay hook to retrieve the uterine horn. The spay hook will be directed along the body wall with the hook facing the body wall down to the dorsal aspect of the abdomen, then across to midline. The hook will be turned 180 degrees and come straight up. The spay hook will often retrieve various abdominal contents such as mesentery, omentum, and ideally the uterine horn or broad ligament. If you are unable to locate the right uterine horn, then the spay hook should be attempted on the left side. It is important to remember that the spleen often becomes engorged and we do want to inadvertently injure the spleen with our spay hook. Often in dogs the broad ligament, rather than the uterine horn, will be retrieved; if this occurs look on either side of the broad ligament for the uterine horn. Once you have found a structure which you believe to be the uterine horn, it is important to find both the uterine bifurcation and the ovary. No clamps should be placed until both of these structures are found.

Narrator: Once you have identified the uterine horn, the next step is to break down the suspensory ligament. In order to identify the suspensory ligament in the abdomen, caudal traction needs to be placed on the uterine horn; this may be done digitally as will be demonstrated here, or you may place a clamp on the proper ligament to provide caudal traction. To break down the suspensory ligament insert your finger to the extent of the ligament, which should be arising off the kidney or the lateral body wall. Strum the ligament medially or towards the animal's spine. Once the ligament has broken, adequate exposure will be achieved.

Narrator: A window is then made in the broad ligament, caudal to the ovary, and clamps are placed. A crile clamp is placed just under the ovary, the ovary should be palpated as this clamp is placed to ensure we take the entire ovary. A carmalt clamp is then placed below the crile clamp as close to the body of the animal as possible, or proximally along the ovarian pedicle. This is where the ligatures will be placed. The first ligature is an encircling ligature which is placed just under the carmalt clamp. In a large dog it is desirable to use a surgeon's knot for this ligature. The double loops of the surgeon's knot should not override each other as this will cause the ligature to not tighten appropriately. Once the ligature is tightened underneath the clamp, the carmalt clamp is removed, the ligature is tightened maximally and allowed to slide into the crushed tissue.

Narrator: You can see as the clamp is removed the ligature is allowed to slide into the crush and tightened. As the second throw is set up, notice that both ends of the suture are slack. Any tension on either side of the suture will cause the ligature to loosen. With all the ligatures it is

important that the throws be nice and square, there should be six to eight throws for every ligature. The second ligature will be a transfixing ligature. Recall that a transfixing ligature requires that a bite of tissue be taken to anchor the ligature. Two throws are performed and the ends are taken to the other side of the pedicle and six to eight throws are performed. The ligatures should be as close as possible to one another without being on top. As you tie the second suture, be sure the ends of the first suture do not become entrapped in the ligature. Remember that on the second throw there should be no tension on either side of the suture, otherwise the ligature will loosen.

Narrator: Once the ligatures are complete, a mosquito hemostat is used to grasp the ovarian pedicle just below the crile clamp. It is desirable to grab as little tissue as possible. The pedicle is amputated using a blade. There is a fair amount of blood entrapped within the pedicle and it is important to milk this out with a gauze sponge so that we may be able to adequately assess hemorrhage. Insert the pedicle into the abdomen to remove any tension on it, inspect for bleeding, if there is none, release. If you observe hemorrhage pull the pedicle up and re-ligate. Often the end of the pedicle attached to the ovary will leak around the crile clamp; if this occurs add a second clamp just behind the ovary across the proper ligament to prevent any back bleeding.

Narrator: It is now time to digitally break down the broad ligament. Recall that the blood supply originates along the uterine body and flows up along the uterine horn. Therefore, if we break the broad ligament closest to the incision we will avoid the major vessels. Tear between your fingers so you may observe if there are any vessels which will be bleeding. The round ligament will be encountered as you move through the broad ligament; this may also be broken digitally. Use care as you approach the vessel and return the amputated portion of the broad ligament to the abdomen.

Narrator: Digitally retrieve the opposite uterine horn, provide traction on the horn in order to identify the suspensory ligament. Remember to break the suspensory ligament at its origin on the kidney or lateral body wall, strumming medially or towards the animal's spine. There are numerous small vessels which feed the ovary rather than one or two large vessels as you can see here. A window is made just behind the vasculature in the broad ligament. A crile clamp is placed just under the ovary. Remember to palpate the ovary as you place the clamp in order to ensure that the entire ovary is removed. A carmalt clamp is placed proximal to the crile clamp.

Narrator: An encircling ligature is placed just below the carmalt clamp. The ligature is tightened and the carmalt clamp is removed. The ligature is tightened maximally. Notice again as the second throw is set up there is no tension on either side of the suture. All throws are square and tight. Six to eight throws are done on each ligature. Once the encircling ligature is complete a transfixing ligature is placed just distal to it. Again anchor the transfixing ligature with two throws, then the ends are passed around the pedicle, and the knot is finished with six to eight throws.

Narrator: Once the ligatures are complete, the pedicle is grasped with the mosquito hemostats and amputated just below the clamp. The pedicle is cleaned and inspected for hemorrhage. Once you are satisfied there is no hemorrhage the pedicle should be released into the

abdomen. Once the pedicle is released, the broad ligament is broken down and the uterine bifurcation is exposed. A carmalt clamp is placed across the body of the uterus at the level where the ligatures will be. Ideally, they should be just proximal to the cervix. Once the tissue is crushed, the carmalt clamp is moved proximally, well away from where the ligatures will be. If the clamp is too close, it will artificially spread the tissue which you are trying to ligate.

Narrator: A transfixing ligature is placed. This ligature will take a small bite of the uterine body and encircle the vessel on the lateral side. Once again, two throws are placed to anchor the ligature and provide pressure on the lateral vessel, then the ends are taken around the uterine body and six to eight throws are tied on the opposite side. It is important to ensure, as you tie each of your throws, that you do not inadvertently incorporate body wall or omentum or even the bladder into your throws. Once the knot is finished the ends are cut short. A second transfixing ligature is then placed starting on the opposite side. Once again a bite of the uterine body is taken, two throws are performed to anchor the ligature and give pressure on the lateral vessel. The ends of the sutre are then passed to the other side of the uterine body and six to eight throws are performed.

Narrator: All throws are square and tight. Once the ligatures are completed the uterine body is grasped with the mosquito hemostat, just proximal to the ligatures and the uterine body is amputated. It is important to grasp uterine body tissue rather than the lateral sides of the stump as the lateral sides are where the vessels are located and we do not want to include those as we inspect for hemorrhage. The stump is cleaned, replaced in the abdomen where it is without tension. Once inspected it is released. Once the uterine stump is released the abdomen is inspected for hemorrhage before closure begins. Inspection may be done visually or a sponge forcep may be used.

Narrator: Closure of the abdominal wall is critical to a successful spay surgery. Here you can see the perineum, the muscle layer, and now the rectus sheath. The rectus sheath is the holding layer of the abdominal wall. It is critical that every bite of our body wall closure incorporate the rectus sheath. Thumb forceps should be used to grasp the rectus sheath. The needle is directed just under the rectus sheath and on top of the muscle. We want to incorporate as little muscle as possible in our abdominal wall closure as the muscle is not a holding layer and will only necrose. Bites should be a minimum of five millimeters from the cut edge of the rectus sheath, ideally they should be larger than that. If the abdominal wall is under tension you may need a surgeon’s knot to begin the closure. In the case of this dog, that is what was needed. At least eight throws should be performed on each end of a continuous line in the body wall. All throws should be snug and square.

Narrator: Once the knot is complete the short end of the suture is cut and the other end is continued in a continuous line down the body wall. A simple continuous pattern is used in the body wall. Each suture should be no more than five millimeters apart and each bite should slide just under the rectus sheath, incorporating as little muscle as possible.

Narrator: Once the rectus sheath has been closed at least eight throws are used to end the continuous line. Remember that when you tie knots with a loop it is important to open the needle

holders slightly so that the loop will slide to its end; this will ensure even placement of the throws. Once the knot is complete both ends are cut short.

Narrator: The incisional line block is now performed. The subcutaneous closure is started at the cranial end of the incision, four or five throws are adequate for subcutis or intradermal closure. All throws should be square and snug. A simple continuous pattern is used to move towards the caudal end of the incision. If there is considerable dead space to close, a continuous purse string pattern may be utilized. A suture tag is left at the cranial end in order to tie off the intradermal line. Sutures in the subcutis may be widely spaced. It is desirable to avoid using thumb forceps if possible in order to decrease trauma to the skin and subcutaneous tissues.

Narrator: At the caudal end of the incision the intradermal line is begun. The needle should be directed caudally to exit at the point of incision in the dermis. The dermis should be thought of as the junction of the skin and the subcutaneous tissues. It is critical that this junction be achieved on every stitch. If it is not, the incision will have a tendency to gape open. Once again it is desirable to avoid using thumb forceps.

Narrator: During the intradermal placement the skin edge should be rolled out in order to facilitate visualization. Tension is placed on the skin to allow the needle to enter. Pay attention to the suture line as you move cranially, if any suture exits the skin it should be removed and replaced. Every few sutures you should place cranial tension on the suture line and attempt to spread the incision edges open. If you are able to spread them open and they stay open, this indicates that you are getting the subcutaneous layer rather than the intradermal layer and adjustments should be made.

Narrator: As you approach your cranial suture tag, it is important to keep it cranial to where you are suturing, that is you are over the tag; this will allow the knot to bury. If it is not kept cranial, it will allow sutures to become entrapped between the two edges of the knot and there is no way the knot will bury. At the cranial end of the incision, tie the suture to the suture tag which was left previously. Four or five throws is sufficient, all throws should be square and tight. Cut the short end of suture and put caudal traction on the suture. Direct the needle between the knot and the cranial end of the incision, exit the skin cranially, and pull the suture so that the knot goes into the subcutaneous layer; stabilize the skin edges as you do this. Cut the suture as it exits the skin, place at least one skin suture to ensure that clients will return for us to inspect the body wall.

END TRANSCRIPTION