

Small Ruminant Castration

Small Ruminant Castration Overview:

Castration is the most common surgical procedure performed in small ruminant practice.

Preoperative Considerations:

The clinician should administer tetanus toxoids or antitoxins when castrating animals. Lambs and kids should receive 150 to 250 units of tetanus antitoxin; adults of unknown vaccination history should receive 500 to 750 units of antitoxin. Previously vaccinated adults should receive a tetanus toxoid booster. In some instances antibiotics may be of value.

Castration Age:

Routine castration of lambs and kids is usually done during the first week of life. However, if the lamb or kid is to be a long term pet, it is advisable to wait until the animal is at least 5 to 6 months old to allow for growth of the penis and urethra and detachment of penile adhesions. Evisceration may occur at any age but appears more common in young goats; some breed predisposition (pygmy, Spanish meat) is possible.

Castration Methods:

Surgical Castration

Surgical removal of the testes is superior to all other forms of castration. During the surgical removal of the scrotum and testicles, animals may be lightly sedated, anesthetized, or held by a helper or technician. Young lambs or kids 2 to 4 days old are often castrated by this method without anesthesia. However, sedation can be beneficial because of their vocalization and their greater tendency to develop hypotensive shock. Anesthesia can be achieved by local infiltration of lidocaine hydrochloride in smaller animals. A 1% solution is recommended to prevent lidocaine toxicity. Large bucks and rams should be sedated with xylazine hydrochloride (0.05 to 0.3 mg/kg IM) because they are susceptible to shock associated with the stress and pain of castration. In young kids or lambs the lower third of the scrotum is removed by a scalpel blade to expose both testicles. In weanlings and adult bucks or rams, the surgeon makes an incision over each testis or removes the distal third of the scrotum. The scrotal fascia is then stripped away from the testicles. The surgeon pulls the testicles ventrally by steady traction while breaking the cremaster muscle and the

scrotal fascia away from the remaining spermatic cord. The spermatic cord should be torn in such a manner that it breaks dorsal to the pampiniform plexus. When castrating rams or bucks older than 4 months of age and when castrating during the breeding season, the clinician may need to use an emasculator or place a transfixation ligature cranial to the pampiniform plexus to prevent or control hemorrhage. In cases in which hemorrhage appears to be clinically significant, the bleeding vessels should be located, cleaned, and ligated. If the bleeding vessel cannot be identified, the clinician should pack the scrotum with sterile gauze, antiseptic-soaked gauze (iodine), or epinephrine-soaked gauze and then suture the scrotum closed. If gauze is not available and the bleeding vessels cannot be located, the surgeon can close the scrotum with a purse-string suture or a through and-through suture pattern to obliterate any "dead space." The scrotum should be reopened and the gauze removed 12 to 18 hours after the surgery. These animals may benefit from antibiotic therapy (penicillin 20,000 IU/kg) for 1 to 4 days. On rare occasions, when the testicles are pulled to allow the cord to rupture above the pampiniform plexus, the testicular artery may be avulsed from the aorta, resulting in fatal or near-fatal hemorrhage. Excessive tension can occasionally tear the ureter from the urinary bladder. Complications are rare with this method. It is easy to perform, and if done quickly, it appears to be associated with limited stress. Animals need exercise after castration to reduce postoperative swelling.

Elastrator

Elastrator castration is the simplest and most common technique used by producers. Lambs and kids younger than 1 to 3 weeks of age are the most suitable candidates for this technique. A very heavy rubber ring is placed around the neck of the scrotum with a special applicator. Care must be taken to ensure that the entire scrotum is included within the band. The penis should be palpated to ensure that it is not trapped within the band. Placing the band over the testicular cord and not directly against the abdominal wall helps prevent the trapping of any portion of the penis (sigmoid flexure). The rubber band method may initially appear to be less traumatic and stressful, but it is considered inhumane by some if it is performed on animals older than 3 weeks of age. The scrotal sac and the trapped testicles become ischemic, die, and drop off within 2 weeks. No hemorrhaging occurs because no open wound is formed, but the risk of tetanus is increased compared with other techniques. Occasionally the blood supply to one or both testicles does not become occluded, and the testicles continue to elaborate testosterone.

Burdizzo Emasculator

A third method that may be used in older sheep and goats is castration by emasculator. The main advantage of this technique is the absence of an open wound and the decreased risk of tetanus (compared with elastrator bands). Anesthesia is usually not required or used. A Burdizzo emasculator crushes the spermatic cord and its blood vessels above each testis. The operator holds each cord tightly against the lateral aspect of the scrotum with one hand while applying the instrument twice on each side to crush the cord. The

crushes are made 2 cm apart, ensuring that the midline of the scrotum is not crossed. The testicular cords may be clamped together or separately as previously described. When employing an emasculator, the operator should ensure that both testicular cords are completely clamped. The complications of this method include testicular survival, scrotal sloughing, extreme scrotal swelling, tetanus, and undue suffering. One author of this chapter (Dr. Pugh) considers this the most inhumane method of castration. As with the banding method, the devitalized tissue is allowed to slough.

Elastic Band Castration

In very young animals, the most common technique is to use an elastic band. The elastic band inhibits blood flow to the testicles and the scrotum. After a while, the scrotum and testicles descend off the body. Un-proper castration techniques could result in a retained testicle. The band and applicator pliers should be soaked in disinfectant before use. Once the animal is restrained, the band is applied around the neck of the scrotum by using the pliers.

When using the elastic band:

1. Use elastic rings that are no more than 12 months old to assure a tight fit around the scrotum and also prevent breakage. The rings need to be small enough to shut off blood flow in the arteries because the scrotum will swell if not tight enough.
2. Pull both testicles in to the scrotum and hold.
3. Stretch the ring over the testicles and scrotum. Let go of the band just above the top of the testicles, not at the base of the scrotum.
4. Once on, make sure both testicles are still in the bottom of the scrotum and that the ring is in the right position.

Other commercially available tools are designed to place heavy walled latex tubing around the neck of the scrotum in older animals. The scrotum and testes usually slough within 3 weeks of band application. This technique is used quite commonly in small ruminants less than one month of age.

Callicrate Bander

The callicrate bander has been used successfully on older goats after the long hair was clipped from the neck of the scrotum. Older, small ruminants should be handled the same as older calves with sedation and surgery; however, one should always be mindful of small ruminant sensitivity to lidocaine.



Hemicastration

A decision may be made to remove a diseased testicle to prevent the spread of disease or heat-induced testicular degeneration (such as that caused by inflammation) to the healthy testicle. The ram or buck should not eat for 48 hours and not drink for 24 hours before being put under general anesthesia; the clinician should administer a broad-spectrum antibiotic 2 to 4 hours before surgery. The animal should be anesthetized (Chapter 16), placed in right lateral recumbency, and have the entire scrotum and surrounding areas clipped and prepared aseptically. The surgeon makes an elliptical skin incision on the lateral surface of the scrotum, starting near the base of the affected testicle and extending to near the apex. This incision should include the tunica dartos muscle. The surgeon should take care not to extend the incision into the normal hemiscrotum. This elliptical incision should be wide enough to remove any excess skin after the testicle is removed; however, the surgeon should be careful to leave enough skin to close the wound. The testicle and its associated tunics are bluntly dissected away from the scrotum. The vaginal tunics should be excised to expose the testicle and spermatic cord. The spermatic artery and vein should be ligated with a transfixation suture (0 gut) at a level above the pampiniform plexus. The cremaster muscle should also be ligated at a point proximal to the vascular ligature. A separate ligature should be placed around the entire spermatic cord. A clamp or suture is placed around the cord approximately 5 to 6 cm distal to the vascular suture, and the cord is transected.

The remaining vaginal tunic is transected far enough distally to allow the tunics to be closed over the remaining cord. An inverting suture pattern (Connell or Parker-Kerr) is used with an absorbable material (0 gut). The tunica dartos muscle is closed over the wound with a simple continuous pattern. The longitudinal skin incision should be closed, and if excess skin is present it should be trimmed so that no dead space remains. The scrotum can be bandaged immediately after surgery if bleeding is expected. This bandage should be left in place no longer than 12 hours to avoid thermal damage to the remaining testicle. Routine presurgical antibiotics (penicillin or tetracycline) should be continued post surgically as needed. NSAIDs may be indicated for control of pain, swelling, and other signs of inflammation.

Postoperative Care:

After castration, animals should be observed for abnormalities such as excessive swelling, hemorrhage, and signs of infections such as depression, decreased appetite, and abnormal drainage. When older animals are castrated or with an unclean environment, perioperative antibiotics are administered for 5 to 7 days.

Complications:

Tetanus is a worry in small ruminants and may be of concern in bulls that are castrated with the callicrate bander. Minimal complications— including seroma formation, swelling, and inflammation at the surgery site—are typical. These are usually self-limiting and resolve without further treatment. Other castration complications include infection and

hemorrhage. With an open wound, any incisional infection or swelling can usually be handled by simply providing adequate ventral drainage and enlarging the incision bluntly. If appropriate technique is used, hemorrhage is rarely a major problem. If persistent hemorrhage does occur, it may be necessary to pack the scrotum with a sterile towel, laparotomy pad, or gauze roll, with removal in 48 hours. When the sterile packing is removed, any retained blood clot should be gently expressed. If this is elected, antibiotics are appropriate since the packing material can serve as a foreign body in a closed space, thus making a localized infection more likely.

Addition information:

- 1) Sheep standards and guidelines castration discussion paper prepared by the sheep standards and guidelines > <http://www.animalwelfarestandards.net.au/files/2011/05/Sheep-Castration-discussion-paper-5.3.13.pdf>
- 2) Castration of Sheep and Goats > <http://www.esgpip.org/PDF/Technical%20bulletin%20No.%2018.pdf>
- 3) Castration of A Ram > http://www.youtube.com/watch?v=_jVW1yRL8D8
- 4) Goat Castrating > <http://www.youtube.com/watch?v=jHnDLsZ2kCk>