

## Surgical Castration

### Types of open surgical castration:

- Surgical ligation (Open-closed method and Open-open method)
- Emasculator (Serra, White, Reimer)
- Newberry castrating knife.
- Dual-action Emasculotome.
- Henderson castration tool.
- Incise, twist and pull

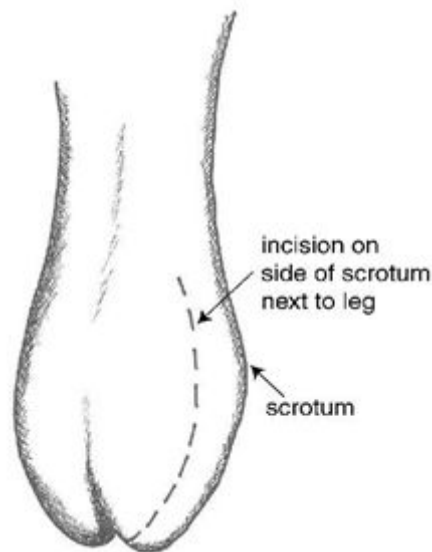
### Open-closed method

1. Standard aseptic preparation. Equipment should also be sterile.
2. The calf be placed in lateral recumbency and restrained so the testicles can be easily accessed or the calf can be restrained in a squeeze chute.
3. Position yourself at the side or rear of the calf and reach forward between the hind legs.
4. Make sure the scrotum is clean (hair is clipped). Use a mild surface disinfectant (iodine) to prepare the incision sites.
5. Make an incision to open the skin of the scrotum. (This can be done via Method A or Method B; described below)
6. Pull the testicle through the incision. It will be covered with a thin, but tough, white membrane. Separate this from the testicle by pulling it away near the tip of the testicle.
7. The remaining tough cord contains the artery, veins and spermatic cord.
8. In older calves, use an emasculator to crush and cut both blood vessels and spermatic cord at the same time. An emasculator lessens the risk of bleeding. (The emasculator must be placed on the cord correctly in order to crush the cord properly).
9. In younger calves (<3 months), it is common to separate the blood vessels from the vas deferens. Shave through the vas deferens with the scalpel. Gently pull the vessels until the strand breaks.

10. The spermatic cord can be ligated using a monofilament absorbable suture if required (number 3 absorbable Catgut chromic thread). The ligature is placed as proximally and tightly as possible around the cord. Either cut the cord or emasculate it distal to the placement of the ligature. (this technique greatly decreases haemorrhage however there is the chance of infection due to the suture being a foreign body)
11. Repeat on the other side.

### **Incision Method A:**

- Make the incisions on the outside of the lower half of each side of the scrotum.
- Once the testicle is in the proper site, hold it there and use a scalpel to make an incision over the testicle. The incision may extend into the testicle itself.

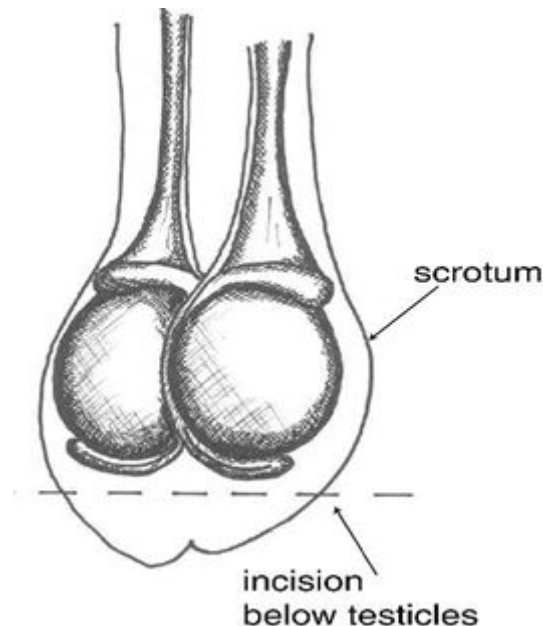


### **Incision method B:**

- Use one incision to remove the bottom third of the scrotum. To do this, first push the testicles up toward the body so the lower third of the scrotum is empty.
- Grasp the tip of the scrotum between your thumb and forefinger or pull the bottom of the scrotum down and back using surgical clamps.
- Use a sharp scalpel to cut across the scrotum just above your thumb and finger. This cut will completely remove the tip of the scrotum and the testicles (with the tunic still attached) will fall down or can be pulled down by reaching up into the open scrotum (pull the testicle down gently while pushing the scrotal skin

upwards. Slowly pull the testicle down and back until the muscle separates from the spermatic cord.)

- The testicles would still be within the vaginal tunic and the facia is stripped from the skin



Surgical ligation: vaginal tunic is not incised (it remains intact)

### Open-open method

1. Surgical castration is performed by making an opening in the scrotum & removing the testicles. A larger opening is preferred as this allows for better draining.
2. In young calves, the bottom  $\frac{1}{3}$  of the scrotum is removed by a horizontal incision with a sharp blade or scalpel.
3. Isolate the spermatic cord & cut or apply tension evenly on the cord until it breaks free.
4. For older bulls, either a horizontal incision or a vertical incision can be made. An incision should be made which is large enough to allow for drainage.
5. The wound is left open to drain and heal via secondary intention.
6. A Newberry knife is one of the safest methods to make two vertical incisions, for the removal of each testicle.
7. An emasculator is used to clamp and cut the spermatic cord. This should be left in place for 15 to 20 seconds to control bleeding.
8. Ensure sufficient tunica is removed to prevent the formation of hydrocoele. Excess tissue should also be removed.

Surgical ligation: vaginal tunic is incised to expose the testicle and its structures

### Newberry castration technique:

- Pull the scrotum down and back before applying the Newberry knife.
- The blade of the knife should be placed against the side of the scrotum, below the testicles. Always use the blade half way up the length of the scrotum.
- Squeeze the jaws of the knife closed in a side to side manner.
- Forcefully pull the knife down and back in a 45 degree angle which allows for the opening of the scrotum. This splitting of the scrotum allows for better access and drainage.

### Emasculator use:

- This can be used with surgical ligation or the Newberry castration technique
- Various types are available.
- The Reimer emasculator has 2 crushing sides and 1 cutting surface.
- The key to using an emasculator effectively is ensuring it is “nut to nut” (the testicle and the nut in the emasculator should be on the same side facing each other).
- Ensure it is placed straight across one spermatic cord at a time and no skin is caught inside it.
- It is held clamped for at least 1 minute with the crushing side being as close to the body wall as possible.

### Henderson castration tool:

- This can be used with surgical ligation or the Newberry castration technique
- The tool is attached to a power drill and a twisting motion is applied.
- It is especially useful for older animals as there is good hemostasis.
- Once the testicles are exposed and the cords are stripped, place the clamp proximal to the testicle and on one spermatic cord at a time.
- This allows for a slow twisting action that closes the tunica vaginalis.
- It simultaneously removes the testicle and allows for haemostasis ( taking approximately 20 rotations of the drill)
- Preferably use this technique on smaller calves and not more than 1200 pound animals.
- Gut tie can occur and if twisting too quickly, the testicles can be removed before there is proper haemostasis.

### Incise, twist and pull:

- This can be used with surgical ligation or the Newberry castration technique
- It should only be used for calves less than 90kg
- Exteriorize the testicles and apply traction, stretching the spermatic cord (one testicle at a time)

- Maintain the tension while twisting and stretching the spermatic cord until it breaks and the vasculature ruptures
- Since the spermatic vessel is not ligated, there is greater chances of haemorrhage

### **Advantages**

- Removes both testicles, thus most certain method of castration
- Faster healing when compared to elastic band

### **Complications**

- Hemorrhaging
- Excessive swelling of the scrotum
- Infection of the scrotal tissue
- Tetanus
- Seroma formation
- Myiasis
- Draining of scrotal sac may become obstructed

## **References**

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