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| **INTRA-OPERATIVE PROCEDURE AND TECHNIQUES** |
| **CLOSE METHOD:** This method includes both chemical and mechanical techniques. Within this method no incision is made through the scrotum, instead; mechanically the spermatic cord and its contents (nerves & blood vessels) are crushed or constriction through the skin of the scrotum or chemically, substance are use to inhibit the sex hormones of the male specie. |
| **EQUIPMENTS/ TOOLS** | **PROCEDURE** |
| 1. **111.PNG.jpgBurdizzo Clamp/ Emaculatome**

  | 1. Animal should be properly restrained by the assistant using Chemical restraint and/ Mechanical restraint (see pre-op procedures).
2. Animal is positioned in either dorsal, lateral recumbency or standing position.
3. The testes are then manipulated down into the scrotum.
4. Push the left spermatic cord to the far left side of the scrotum and the right spermatic cord to the far right side of the scrotum.
5. Place the emasculatome over the first spermatic cord about 1.5 to 2cm over the testes ensuring that the C-shaped side of the jaw is facing upwards to keep the spermatic cord from slipping out of the Burdizzo.
6. Clamp the burdizzo over the first spermatic cord and feel to ensur its between the jaws of the emaculatome then hold for 1 minute ensuring that the midline/septum (blood supply) of scrotum is not crushed.
7. The process is then repeated for the second spermatic cord slightly staggering the crush line.
8. The procedure is then performed a second time on both spermatic cord 1cm below the first crush line to ensure that the spermatic cord is properly crushed.
9. Finally remove the burdizzo and inspect the scrotum for any break in the skin.
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| **Avantage/Reasons:** * Quick, easy and Bloodless.
* No open wounds so less chance of infection
* No risk of maggot infestation even during the fly season.
* Less painful than cutting.

**Disavantages/ Complications:*** Chance of injury to the animal.
* If clamped too close to the body wall, the penis may be damaged by accident
* Mistakes while clamping, such as slipping of the spermatic cord
* Improper technique leading to clamping of the scrotal blood supply along the midline of the scrotum, leading to necrosis and slotting off of the scrotum
* Partially crushed spermatic cord
* Faulty equipment which leads to a break in the skin.

**https://www.youtube.com/watch?v=NG0vKqkc3XI** |
| 1. **111.PNG.jpgELASTRATOR/ BANDING:**
 | **PROCEDURE:**1. Proper restraint and pain management (see pre-op procedures)
2. Ensure that both testicles are pulled down into the scrotum.
3. Place a rubber ring over the prongs of the elastrator and hold the elastrator with the prongs facing up, then close the handles to open the band.
4. Pass the scrotum with both testes through the open band.
5. Position the elastrator as close to the animal's body as possible, with care taken not to place the band over the rudimentary teats or involve the penis.
6. Open the handle of elastrators displacing the ring from the prongs on to the scrotum
7. Finally remove the elastrator from under the band and check if the two testes are within the scrotal sac and the band is properly placed.

**https://www.youtube.com/watch?v=sfeLIYI3\_Uc&list=PLaZwbJ6DZkM0EOE-**v\_FIYxTwdONW\_ADE4 |
| **Avantage/Reasons:** * Quick, easy and Bloodless.
* No open wounds so less chance of infection
* No risk of maggot infestation even during the fly season.
* Testes fall off completely

**Disavantages/ Complications:*** Rubber ring may brittle and snap before scrotal atrophy can occur.
* The band can leave a wound around the scrotum which can lead to infection and possibly tetanus in sheep and goats.
* If procedure is monitored properly one or both testes can slip out of the band.
* Extreme pain and discomfort, which negatively affect growth rate.
* Animal welfare concern.
* Age limitation due to the extreme levels of pain.
* Time consuming- frequent checkups to see if the band is still around the neck of the scrotum.
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| **CALLICRATE METHODS:** | **PROCEDURE:**1. Proper restraint and pain management (see pre-op procedures).
2. The loop or band is then loaded into the callicrate bander and loop is then secured with the tension cord passed through the end of the loop from the ventral aspect.
3. Ensure that both testicles are pulled down into the scrotum.
4. From behind the animal, place the scrotum through the loop of the band and ensure it’s properly positioned around the neck of the scrotum.
5. Keep adjusting the lever on the callicrate until the tension indicator moves to the back of the slot, this ensures proper tension is achieved.
6. Final push the crimping handle down and ensure the clip is properly crimped.
7. Finally cut the loop close to the callicrate bander.

**http://www.callicratebanders.com/video/** |
| **Avantage/Reasons:** * Quick, easy and Bloodless.
* More secure than the elastrator
* No open wounds so less chance of infection
* No risk of maggot infestation even during the fly season.
* testes fall off completely
* Not age limiting.

**Disavantages/ Complications:*** Extreme pain and discomfort
* Animal welfare concern.
* Callicrate methods without anaesthesia for older bulls deemed inhumane and unethical.
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| **CHEMICAL/IMMUNOCASTRATION:**Chemical- sclerosing agents eg. 88% lactic acidlac.jpgHormones: Immunocotroceptives and vaccines | **PROCEDURE:** **Chemical castration:**1. Proper restraint and pain management is done before procedure.
2. Then one or two injections of 88% lactic acid are into the testicular parenchyma, one injection at every 6 months interval.
3. The animal should be monitored over the time period to ensure little or no sexual behavior is seen.

**Hormonal castration:** 1. Animal is restraint using a stanchion/ crush and a hormonal inhibitor vaccine is given every 6-8 month interval. The vaccines induce antibody production against gonadotropin releasing hormone (GnRH), resulting in the inhibition endogenous hormones.
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| **Avantage/Reasons:** * Least painful of all the procedure, bloodless with minimal risk of infection and no risk of myiasis
* Testosterone inhibition results in a reduction in aggressive behavior
* Hormonal treatment can be reversed.
* Immunocastration has been shown to increase live weight, average daily gain and dressing percentage

**Disavantages/ Complications:*** Not as effective as the other methods of castration (cutting, crushing or banding).
* Skilled and experience personnel necessary.
* Time consuming due to the need for vaccinations at regular intervals.
* Require twice the healing time compared to surgical castration
* Risk of vaccine failure or risk of drug adverse effects.
* Persistent sexual behaviors (mounting) can be seen.
* Limited duration of effect.
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