SURGICAL FIELD WORK WITH R-VETS

REQUIRED PREPARATION

We expect all participants of the clinic to have prepared. This includes;

1. Read the chapter on equine castration in Turner and McIlwraith “Techniques in Large Animal Surgery”.

2. Practiced the modified miller's knot.

3. Memorize the steps to a routine castration listed below. You should say these steps, out loud or in your head, as you castrate each horse. This will help to ensure that you do not forget any step in the process (this tends to happen after you start to get comfortable with the process)

Steps to a Routine Castration

☐ Identify two Testis
☐ Block Cord (or Testis)
☐ Block Skin
☐ Identify median raphe
☐ Make 2 incisions ½” on either side of the median Raphe, at the bottom of the scrotum
☐ Expose the Down testis
☐ Strip the cord
☐ Place the emasculators
  o Perpendicular to the cord
  o Parallel to the patient
  o Handles Facing toward the rear
☐ Check that the ratchet lock is open
☐ Close the emasculators just until they grab
☐ Check for skin caught in emasculator jaws
☐ Close emasculators COMPLETELY in one smooth motion
☐ Expose the up testis
☐ Strip the cord
☐ Place the emasculators
  o Perpendicular to the cord
  o Parallel to the patient
  o Handles Facing toward the rear
☐ Check that the ratchet lock is open
☐ Close the emasculators just until they grab
☐ Check for skin
☐ Close emasculators COMPLETELY in one smooth motion
☐ Stretch incision
☐ Remove the down emasculator
  Perpendicular to the cord
☐ Check For Bleeding
☐ Clean your patient

If you do not know the steps to a castration, should you be doing one?

• Work days tend to be long. Individual or group inefficiency and unpreparedness will lengthen the day. This results directly and indirectly in a loss of teaching time as there is
  o Less time to rest/recover
  o Less time to round – without rounds the learning experience is incomplete.
Keep in mind that the staff may be on the road for 2 months. Cumulative lost rest is a significant issue for us.

- **DO NOT** sit or chat if all equipment and supplies are not ready for the next procedure.

- Students will be assigned to a team. The team may rotate working with different doctors. You should communicate within and between teams so that everyone is ready and plays their own position.

- Maintain all necessary equipment and drugs so that they are easily available, clearly labeled, and easy to move (this is particularly important in an emergency, and you never know what you will need). **DO NOT** carry supplies in pockets (they will fall out when you bend over) or in an arm load (you will drop them). We have caddies, buckets, bucket buddies, and toolboxes for this purpose. Blades, needles and syringes must be put in the caddy immediately after use to avoid their getting lost.

- **Start and stay prepared.** Each evening the group is expected to prepare for the following day. Volunteers are responsible for adequately preparing for the day’s work. Check that there are sufficient:

  - Forms
  - Vaccines—tetanus antitoxin, tetanus, and rabies
  - Cooler/Ice packs
  - Sterile surgical gloves
  - Garbage bags
  - Buckets
  - Sharps containers
  - Caddies
  - The equine surgery box—fully stocked
  - The equine foot box
  - Banamine
  - Drinking water
  - PPG
  - Insect repellant

- **THE SURGERY**
  
  Anesthesia is discussed in another section

  - Syringes
  - Needles
  - Blades
  - Buckets
  - Caddies
  - Carbocaine
  - Banamine
  - PPG
  - Snacks/lunch
  - Equine pharmacy
  - Filled carboys, collapsible water jugs or buckets lined with garbage bags, twisted shut above the water level

- All team members should be prepared to perform their assigned tasks prior to the patient becoming recumbent. You should know your task for the current procedure, (and for the next one). Always look ahead!

- **Stay prepared.**

- Once the patient is recumbent and adequately anesthetized the rest of team should move quickly to complete their assigned task/tasks as efficiently as possible.

- Do not rush the patient. Wait until they are fully relaxed to proceed. The upper leg should be resting on the ground.

- Everyone involved in the process must remain on the horses back side, which is the side away from the hooves.

- The exception to this is if you are doing a procedure involving the leg or foot.
1. Prior to the patient becoming recumbent each team member should check that all supplies are ready for the patient. Each member of the team has an assigned task.  

   NOTE: Each time you reach into the vaccine cooler, feel the icepacks. Vaccine must not be allowed to become warm. If the icepacks are not frozen, replace them immediately.

Support Team

2. Tie the leg.

To provide the maximum exposure for students; (patient positioned on left side)

- Stand behind the patient. Raise the upper leg (the patient’s right leg)
- Stand so that you are in contact with the leg so that if the patient moves you will be pushed, not kicked
- Place the noose around the pastern.
- Figure eight twice around the hock ending at the pastern.
- Place a half hitch at the pastern.
- Step back from the patient
- Pass the rope behind yourself.
- Sit back on the rope, allowing your weight to do the work
- **DO NOT TIE THE ROPE AROUND YOURSELF.**
- The rope should lie smooth and flat on the leg.
- A ¾ “rope of adequate length (15-20 feet) is the rope of choice for adult horses.
- A 5/8” rope 12-15 feet long is more suitable for minis, ponies, foals and/or burros.

3. Scrub

- Place bucket behind patients’ leg. The bucket should contain
  - 1/3 to ½ full of water
  - Disinfectant
    - Strong tea colored if using betadine
    - 3 ounces per gallon if using nolvasan
    - Practical/ pound cotton torn
    - Spray or squeeze bottle of scrub floating in the bucket
    - **ALWAYS RETURN SCRUB TO BUCKET, NEVER SET DOWN ON GROUND.**
- Place your body against the inside of the leg so that the foot is beside your head
- Squirt or spray the scrotum with scrub.
- Remove a handful of cotton from the bucket, squeeze ½ of the water from it, and scrub the scrotum thoroughly.
- For hernias or cryptorchids us a prep sponge.
- **DO NOT PLACE USED SPONGES INTO THE CLEAN WATER BUCKET.**
- Rinse with clean water from the prep bucket.

4. Block-

To increase exposure, minimize stimulation caused by manipulating the testis and stripping the cord, and paralyze the cremaster and tunic muscles. Increased exposure is also useful in the case of post operative bleeding.

- Use a 35 cc syringe filled with block (cabocaine or lidocaine), and an 18 gauge needle.
- Inject 10 mls block into the each spermatic cord. Isolate and grasp the spermatic cord firmly. Insert the needle where the cord rolls over
To work your needle MUST be in the cord. The block will not migrate across the tunic.

- Inject directly into the center of each testis until you feel them become turgid (full). This is easier to learn, but takes more time and anesthetic, as it must migrate up the cord. If the team is efficient, the castration may be completed before the anesthetic has taken effect.
- Slide the needle under the skin and inject 5-7 mls of block where you plan to incise.
- Replace the needle on the carbocaine syringe and refill. NEVER SET A SYRINGE DOWN WITHOUT A NEEDLE!! Once you do the syringe must be considered contaminated and discarded. Do not remove the needle unless you are holding the replacement needle and are ready to place it.

NOTE: Maintain correct body position as the testis is injected. Always remain in contact with the patient’s leg.

At this point the surgeon can begin. The support team will continue as indicated below.

5. Check the record. If necessary, using your note cards, assess and record;
- BCS
- Age
- Patient description

6. Administer and record
- Vaccines
- flunixin
- PPG (if you are really efficient, you can administer this during the prep. Otherwise, wait until the emasculators are on and the leg rope is released.
- Antitoxin (ONLY IF INDICATED BY PATIENT HISTORY)
- Always verify what is in the syringe prior to administration. Do not administer any drug if you do not fully understand what its function is, and how much the patient should receive.
- State clearly and audibly what you are administering and by what route as you do so. Each step performed during a team effort should be stated clearly in a loud enough voice for the entire team to hear.
- This will prevent patients from receiving the same treatment twice and will allow the scribe to record all pertinent information.

NOTE: All team members should be familiar with all tasks and supplies necessary to complete the castration process. Never stand idle if all equipment and supplies are not ready for the next patient.

SURGEON

1. Prepare for surgery prior to the patient becoming recumbent. Check that you have;
   a. Surgery bucket filled 1/3 to ½ way with water and nolvasan or betadine
   b. Gloves
   c. Blade
   d. Suture (always be prepared to ligate. Don't open the suture, someone can pass it to you, but verify that it is available)
   e. Emasculators
   f. Needle drivers
g. Scissors
h. Large clamp (Ochsner or bronchial clamp)

2. Position your equipment behind the patient’s leg, within your reach

3. Incise
   a. Squat or kneel (on one knee) behind the patient
   b. Place your shoulder against the inside of the patient’s leg
   c. Identify two testi (NEVER INCISE IF YOU HAVE NOT DONE SO)
   d. Use your non dominant hand to stretch the skin taught
      - If the testi are large, place your hand in front of the testi and push them back into the scrotum.
      - If your hand is too small to manage both, do one at a time.
      - If testi are small, simply spread the skin taught over the testi
   e. Identify the median raphe
   f. Make two incisions ~ 1 inch apart on either side of the median raphe. The incision should be;
      - Made through all layers in a single pass
      - Long enough to expose the testis
      - At the lowest point on the scrotum
      - Parallel to one another

4. Exteriorize the testis
   a. Start with the down testis.
   b. “Pop” it through the incision as if you were popping a grape out of its skin
   c. Secure the testis
      - Make a ½ inch incision at the proximal end (nearest the cord) to use as a finger hold
      or
      - Place a clamp (we use a bronchial clamp. A towel clamp is also effective)

5. Strip
   a. Hold the testis in your non dominant hand
   b. With your dominant hand grasp the cord firmly and stroke.
   c. Initially it will feel as if you are not affecting the facia.
   d. Continue stroking and it will fall away all at once.

6. Emasculate
   a. Face the nuts of the emasculator up (nut to nut)
   b. Open the emasculator jaws
   c. Check that the ratchet is open
   d. Place the jaw around the cord with the handles
      - facing to the back of the horse
      - Parallel to the patient’s body
      - Perpendicular to the cord
   e. Close the handles only until they just begin to “bite” the cord
   f. Lie the testis down. This release of all tension on the cord improves the quality of the crush
   g. Using both hands, close the emasculators smoothly and completely
h. Check the ratchet is locked

7. Stretch the incision
   a. Place your index fingers or thumbs in the front and back of the incision
   b. Stretch the incision until you feel it tear. You must mean this when you do it.

8. Repeat the process on the up testis.

9. Reduce the tension on the leg rope and
   a. Allow the leg to drop almost to the lower limb. Allowing the leg drop to the ground may inadvertently release the leg from the rope.
   b. Wait
      • One minute per year of age
      • Longer is better

10. Remove the emasculator
    a. Raise the leg
    b. Open the emasculator
       • Perpendicular to the cord
       • Parallel to the body

11. Check for bleeding as the cord slips back into the patient

12. Trim any tissue that will hang down from the incision after the patient stands up

13. Clean the scrotum

14. Remove the leg rope

15. Pull the down forelimb forward. This will prevent the radial nerve from falling asleep

16. Pick up gauze etc

17. Check the record

18. Prepare for the next patient

Splitting the Cord

At times the size of the cord will necessitate emasculating it in two crushes. This method provides a better crush and requires less hand strength, as the tunic is removed separately. The emasculators do not need to be in place for much time, as the quality of the crush is much higher.

Follow the steps for a routine castration. Once the cord has been stripped;

1. Using a pair of blunt tipped scissors, extend the hole you created for your finger hold as far down the cord as your scissors can easily reach.
2. Place a clamp on the tunic to prevent losing control of it. If lost, the retained tunic can become the focus of a scirrus cord.
3. Use your thumb to puncture a hole through the mesorchian to create two separate portions of the cord
   a. the vessels
   b. the cremaster muscle and tunic
4. Crush the vessels as described in the routine castration. The emasculators do not need to be left on for as long. Crushing the vessels alone results in a better crush, requiring less time.
5. Crush the tunic and cremaster
6. Repeat the process on the second testis
7. Complete the castration process as described for the routine castration
A REVIEW OF IMPORTANT SURGICAL POINTS

- Identify both testi before incising
- Verify that you have adequate exposure prior to emasculating
- Split larger cords to obtain a better crush and minimize bleeding
- Orient the emasculators correctly:
  - Nut to nut
  - Handles
    - Facing toward the patients tail
    - Handles perpendicular to the cord
    - Parallel to the body
- Close the emasculators only until they start to grab or bite the cord, then release all tension on the cord by setting the testis down.
- Verify that the ratchet at the end of the handles is open, allowing it to lock when closed.
- Verify that no skin is caught in the blades of the emasculators
- Close the emasculators completely in one smooth crush.
- Latch the ratchet.

FOLLOWING THESE STEPS WILL REDUCE THE NUMBER AND SEVERITY OF BLEEDING AND RELATED COMPLICATIONS