

How to Perform a Primary Closure Castration Using an Inguinal Incision

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The technique reported provides a quick and safe method for removing descended and nondescended testicles from horses using an inguinal incision, followed by primary closure of the skin. The technique may have a distinct advantage when routine exercise is not possible for some other reasons such as a concurrent orthopedic problem, or when the after care associated with a routine castration is not desirable for the owners such as during fly season, or an owner not wishing to take a horse out of training. Authors' addresses: Battenkill Veterinary Equine PC, PO Box 2, Middle Falls, NY 12848 (Sedrish) and Fox Run Equine Center, 798 Fox Road, Apollo, PA 12848 (Leonard). © 2001 AAEP.

1. Introduction

Castrations are one of the most common surgical procedures performed by equine veterinarians.¹ Several techniques have been described for castrations. These are performed with the horse either standing or under general anesthesia. The two most common techniques are either a closed or an open technique performed through two scrotal incisions made on either side of the median raphe.¹ After the testicles are removed, the incisions are manually enlarged to facilitate drainage and prevent seroma formation or excessive swelling.¹ The horse should be placed in a controlled exercise program after castration via scrotal incisions for two weeks to reduce swelling.

If the testicle is not descended into the scrotum, a horse is considered a cryptorchid. The retained testicle can be located either in an inguinal or an abdominal location. Most surgical techniques for removal of cryptorchid testicles involve anesthetizing and placing the horse in dorsal recumbency. The most common technique for surgical

removal of an undescended testicle involves making an inguinal skin incision. The surgeon can locate the testicle using either a "noninvasive" or an "invasive" technique. The non-invasive technique involves locating the testicle by applying traction on the inguinal extension of the gubernaculum testis. The invasive technique involves placing the surgeon's hand or fingers through the inguinal ring to locate the testicle. Regardless of the technique used, it is recommended to pack the inguinal area with gauze and removing the gauze in approximately 24 h, to prevent evisceration of bowel through the incision.¹ Postoperative management is similar to that for a horse undergoing a routine castration. Other castration techniques have been described, such as making a scrotal incision and then stretching the skin over the inguinal area, scrotal ablation followed by primary closure,² and laparoscopic evaluation and removal.³

Most castrations heal by second intention requiring some degree of aftercare by the owners. However, several authors have reported on

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different techniques of primary closure castrations, including making incisions between the scrotum and the external inguinal ring,⁵ scrotal incisions,⁶ and midline scrotal ablations.^{2,4} Although primary closure techniques showed promise and had a low complication rate, they have not gained widespread acceptance.⁴⁻⁸

The technique reported in this article evaluated removal of both descended and nondescended testicles through an inguinal incision followed by primary closure.

2. Methods

Pre-Operative Preparation

Horses are administered perioperative antibiotics, which vary depending upon the surgeon's preference and are premedicated with phenylbutazone (4.4 mg/kg PO).

Procedure

Horses were anesthetized and placed in dorsal recumbency. After routine clipping of the hair, aseptic skin preparation, and sterile draping of the patient, a 6-cm incision is made through the skin over the inguinal ring, being careful not to incise the scrotal skin. For nondescended testicles, the testicle is located using either the "non-invasive" technique, or if that fails, the invasive technique.¹ For descended testicles, the testicle is manually manipulated from the scrotum into the inguinal area and then exteriorized through the incision. The spermatic cord is then split into the vascular portion and musculofibrous portion. Each part is then either emasculated and ligated in combination or simply ligated using 0 or #1 polygalactin 910^a or polyglycolic acid^b transfixation sutures.

If the invasive technique was used to locate the testicle, the external inguinal ring is palpated. If the surgeon believes that the inguinal ring is excessively large, the external inguinal ring is sutured, using 2 polygalactin 910 in a pre-placed cruciate pattern. The subcutaneous tissue is closed with 2-0 polygalactin 910 in a simple continuous pattern and the skin was closed with either 0 polygalactin 910. The sutures are not removed.

Horses are encouraged to return to full work as soon as possible. The horses that are castrated at the same time as another procedure, such as an orthopedic procedure, may not be able to return to work due to other concurrent problems.

Animals

There were 63 horses included in this study. Horses presented to either Fox Run Equine Center, Louisiana State University, Veterinary Teaching Hospital, or Battenkill Veterinary Equine, PC for castration. The breed distribution was 5 Appaloosas, 23 Standardbreds, 18 Quarter Horses, 5 Thoroughbreds, 1 pony, 4 Warm Bloods, 4 Morgans, 1 Paint, and 1 Missouri Fox Trotter. The ages ranged from

2 days to 19 years with an average of 2.5 years. Thirty-five horses presented for cryptorchid castration, 21 horses for elective castration with two descended testicles, 2 horses for incomplete previous castrations, 2 horses for scrotal hernias, 2 horses for an inguinal hernia, and 1 horse for a testicular tumor. There were a total of 81 descended testicles and 39 nondescended testicles.

3. Results

The results of this technique were favorable. For surgeries involving cryptorchid castrations ($n = 35$), the mean length of surgery was 35 min. Eight of 63 (12.7%) horses experienced mild scrotal or inguinal swelling that resolved with routine hand walking. Three of 63 (4.8%) had appreciable swelling. These horses were treated with combinations of broad spectrum antibiotics, nonsteroidal anti-inflammatory drugs, cold water hydrotherapy, and increased exercise. Two of these horses required the incision to be open to allow for drainage of an accumulation of serum. All three of these horses resolved with no long-term effects. One horse that required the external inguinal ring to be closed was sore when exercised for several weeks. Although the reason for the soreness was never determined it was assumed to be a result of suturing the inguinal ring closed. The soreness did resolve over several weeks and the horse returned to race with no further problems.

The only other complication that occurred was 2 of 63 horses (3.17%) experienced a fever above 102°F the evening after surgery, which resolved by the next day with no treatment. The source of the fever was never determined but thought to be the result of intubation.

Subsequent to this study, one horse developed an inguinal hernia the following day from surgery. As a result of the skin incision being closed the herniated small intestines were isolated into the subcutaneous space and remained sterile. The horse was then anesthetized and the herniated small intestines were replaced into the abdomen. The inguinal ring was then sutured closed as previously described. The animal made a full recovery and was placed back into training within three days.

4. Discussion

The technique reported here proved to be a quick and safe method for removing descended and nondescended testicles from horses through an inguinal incision followed by primary closure of the skin. The technique was associated with minimal complications. The complication rate related to the procedure in this report (4/63 or 6.4%) is comparable to, or better than, the other techniques described.⁵⁻⁷

The most common complications following castrations of horses are excessive swelling, hemorrhage, incisional infection, scirrhous cords, and eventration.⁹ The technique reported here was not associated with excessive swelling at the castration

site in testicles that were either ligated, or emasculated and ligated. Although previous reports have described an increased incidence of hemorrhage and swelling in emasculated testicles compared with ligated testicles, we did not experience this problem.

As a result of closing the incisions and not having a continued source of contamination of the surgery site, we believe that this technique should decrease the occurrence of incisional infections and scirrhous cord formation. Although we did not have any postoperative infections in the cases reported here, the numbers are too low to evaluate.

Eventration of any abdominal viscera did occur in one case. We believe that when the eventration occurred, the skin sutures maintained the viscera in a sterile environment until the horse could be operated. As a result of not having the viscera exposed to the external environment, the subsequent peritonitis that usually occurs with eventration was prevented and the horse made a quicker, safer recovery.

Lowe et al reported on primary closure castration in 16 horses and 5 ponies, using an incision between the scrotum and the inguinal ring.⁵ Only 1 of 21 animals developed moderate edema and 4 of 21 developed fluid distention of the scrotum which decreased in time with exercise. In this report, the spermatic cords were transfixated and transected rather than emasculated.⁵

Cox reported on primary closure of 311 scrotal testes removed from horses and donkeys.⁶ In this report, the structures in the spermatic cord were either ligated or emasculated. This report described making scrotal incisions and then suturing them primarily with polyglycolic acid suture. The authors believed the results of this technique were good, however, they reported slight swelling or

edema in the surgical area and 12 castrations resulted in appreciable hemorrhage. They concluded that they had better results with ligation compared with emasculation.⁶

Barber² and Palmer et al⁴ both reported using a median scrotal ablation technique for removal of descended and nondescended testicles. The two techniques differed in that the spermatic cord was transected via emasculation² or transected after ligation.⁴ Both authors reported good results, but both techniques were time consuming.^{2,4}

In summary, the technique reported here provides a quick and safe method for removing descended and nondescended testicles from horses through an inguinal incision followed by primary closure of the skin.

References and Footnotes

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^aVicryl, Ethicon, Inc, Somerville, NJ 08876-1051.

^bDexon, Davis+Geck, Manati, Puerto Rico, 00701.