

Submitted: 25/10/2014

Accepted: 05/02/2015

Published: 24/02/2015

Contribution to reconstruction of third degree rectovestibular lacerations in mares

A.H. Elkasapy^{1,*} and I.M. Ibrahim²

¹Department of Surgery, Faculty of Veterinary Medicine, Benha University, Egypt

²Department of Surgery, Anesthesiology and Radiology, Faculty of Veterinary Medicine, Cairo University, Egypt

Abstract

The study was conducted on ten mares suffering from third degree rectovestibular laceration. Four uterine washes were performed in all cases by using diluted betadine (mixing 5ml of betadine antiseptic solution in 1 liter of sterile saline) to control vaginal and uterine infections before surgery. Surgical repair of third degree rectovestibular laceration was done by one-stage Goetz technique after four to six weeks of initial injury, with the lateral dissection continued extensively until the two flaps were created and brought to the midline without any tension. Primary healing occurred in all cases without significant complications. The obtained results indicate that mares with third degree rectovestibular lacerations are candidates for uterine wash and one-stage Goetz technique with excessive lateral continuation of the flap.

Keywords: Fertility, Mares, Rectovestibular laceration, Surgery.

Introduction

Third degree rectovestibular lacerations result in disruption of the perineal body, anal sphincter, floor of the rectum and ceiling of the vagina leading to a common opening between vestibule and rectum. Laceration had been classified according to their extent as first, second and third degree lacerations (Aanes, 1988; Emberston, 1990; Farag *et al.*, 2000).

Rectovestibular laceration occasionally occur in mares at first parturition than at any time thereafter. Fetal malposition, large fetal size or aggressive assistance during delivery may play a role. Perineal lacerations are much more common in mares compared to cattle and other domesticated species. The prominence of the vestibulo-vaginal sphincter and remnants of the hymen in mares foaling for the first time are presumed to be responsible for most of these injuries (Kazemi *et al.*, 2010). The powerful expulsive efforts and the rotation of the equine fetus from a dorso-ventral to a dorso-sacral position during parturition (Purohit, 2011) renders the foal's leg to exert undue pressure on the lateral and dorsal walls of the birth canal: thus increasing the chances of laceration (Woodie, 2006).

Surgical interference for acute injury repair should be considered only if it can be performed within a few hours, and if local tissue damage seems compatible with success (Saini *et al.*, 2013). Local debridement of acute injuries may be necessary in some cases and tetanus prophylaxis and temporary antibacterial and anti-inflammatory treatment is recommended. Definitive repair is usually delayed for 4-6 weeks until complete wound contraction and epithelization occurs (Farag *et al.*, 2000; Ghamsari *et al.*, 2008).

Numerous techniques and modifications of techniques have been described. With the basic tenet of all being reconstruction of a shelf between the rectum and vestibule and restoration of the functional perineal body (Aanes, 1988). The principles that need to be observed and fulfilled include appropriate suture material, broad tissue apposition with minimal tension on the suture line. The common methods used are the two-stage repair (Saleh *et al.*, 1988) and the single stage repair using a modifications of the original Goetz-method (Woodie, 2006).

This report aimed to provide details regarding the presurgical considerations and surgical procedures recommended for mares that suffer from third degree perineal lacerations and intended for breeding purpose.

Materials and Methods

This study was performed on ten mares of different ages (3-8 years), and those that suffered from third degree perineal laceration. The cases were eight primiparous and two pluriparous. These cases were referred to the surgery clinic of the Faculty of Veterinary Medicine Cairo and Benha Universities and private practices. The owners of these cases were advised to remain on the same feed regimen for the entire period before and after the operation.

Vaginal and uterine infections were controlled before surgical intervention by making four uterine washes (2 per week) using diluted betadine (mixing of 5 ml of betadine antiseptic solution in 1 liter of sterile saline) (Brinsko *et al.*, 2011). The last wash was performed on the same day of the operation. The surgical repair was performed in the standing position with restrain of the animal in stanchion and under effect of combination of

*Corresponding Author: Abdelhaleem Elkasapy. Department of Surgery, Faculty of Veterinary Medicine, Benha University, Egypt. Tel.: +20 01003127565. Email: abdelhaleem_ekasapy@yahoo.com

sedation of 0.5 mg/kg body weight xylazine HCl (Xylaject, ADWIA, Cairo, Egypt), and posterior epidural analgesia at a dose 8-10 ml lidocaine HCl (Debocaine, Aldebiky, Egypt) (Hall *et al.*, 2001). The tail was bandaged and tied up. The rectum was evacuated from feces as cranial as possible and closed by large tampon. One stay suture or allis tissue forceps was applied on each side of the anal sphincter to provide adequate exposure (Fig. 1A and 1B).

An incision was made along the scar tissue line marking the junction between vestibule/vagina and rectum (Fig. 2A and 2B). Dissection of the rectovestibular shelf was started cranially in a frontal plane and laterally into the submucosal tissues as well as caudally to the level of the perineal skin. Lateral dissection was continued until the two flaps were created and brought to the midline without any tension. Closure suture was made according to the modified Goetz technique (six-bite vertical mattress suture pattern) (Fig. 3). The suture material used to oppose the flaps was a coated multifilament No.2 polyglactin 910 (vicryl, Ethicon Inc.) with a half circle needle.

Prophylactic doses of antitetanic serum, nonsteroidal anti-inflammatory drugs (phenylbutaone) with a dose of 2.2 mg/kg body weight once daily intravenous route (phenyloject, ADWIA, Cairo, Egypt), and broad spectrum antibiotics (Procaine Penicillin 200 mg and Dihydrostreptomycine Sulphate 250 mg) (Pen & Strep, Norbrook laboratories) were injected for five successive days.

Mares were observed frequently after surgery for any evidence of defecation or staining, especially for the first 5 days following surgery. If constipation was found, manual evacuation of the rectum was performed by back racking. Wound healing, recovery and complications were recorded.

Results

Third degree rectovestibular lacerations were recorded in ten mares admitted to the clinic one day after parturition. The tissues was edematous and contaminated with feces and some tissues were not be viable. The repair was delayed 4-6 weeks to allow complete healing of the injured tissues (Fig.1A & 1B).

In eight cases the surgical repair of third degree rectovestibular lacerations healed successfully without any complications. The remaining two cases developed partial wound dehiscence at the anal sphincter that eventually recovered after surgery. The uterine wash using diluted betadine (mixing of 5 ml of betadine antiseptic solution in 1 liter of sterile saline) gave good results on the control of infection. The operated mares were naturally inseminated four months following surgery. Eight pregnant mares delivered normally without complications and two cases showed rectovaginal fistula. Rectovaginal fistula was repaired according to Aanes (1964).



Fig. 1. Third degree rectovestibular lacerations in mares. (A): 45 day post injury, showing absence of vulvar oedema and a band of scar tissue formation. (B): 30day post injury, showing absence of vulvar oedema and a band of scar tissue formation. One stay suture was applied on each side of the anal sphincter to provide adequate exposure.

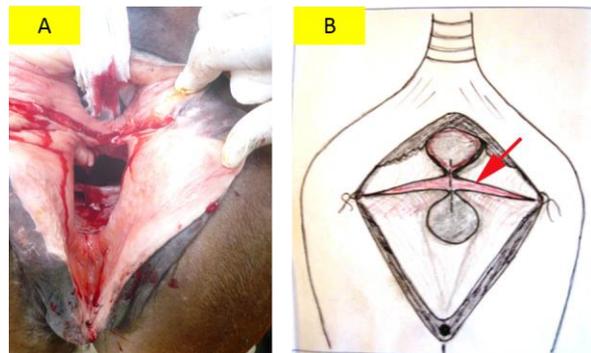


Fig. 2. (A): Dissection along the scar tissue band that separate the rectum from the vestibule. (B): Schematic drawing showing the same (arrow).



Fig. 3. Suture of the perineal skin with No.2 vicryl.

Discussion

In the present study, all cases occurred at parturition following a dystocia. Out of the ten animals, eight were primiparous. This could be attributed to a

prominent annular fold at the vaginovevibular junction, which could be caught by the foal front foot or nose (McKinnon *et al.*, 1991; Mair *et al.*, 1998; Woodie, 2006; Dabas and Sharma, 2011).

To avoid straining on the suture line after surgery many surgeons prefer keeping the animal fasted for up to 5 days before and 9 days after operation (Aanes, 1988; Hospes and Bleul, 2007). In the present study the owners were advised to keep the animals on the same feed without any change, as the change on the feed lead to hard fecal matter which lead to severe straining and rupture of the suture line.

Because immediate repair of third-degree rectovestibular lacerations is not recommended, the single-stage operation in the cases of this study was delayed for 4-6 weeks, to give chance for the rectal and vestibular walls to heal together and for inflammation to resolve. This findings agree with Flower (1960), Aanes (1964), Vaughan (1974), Farag *et al.* (2000) and Saini *et al.* (2013). On the other hand Woodie (2006) reported that acute repair of third-degree injures should be considered only if it can be performed within a few hours, and if local tissue damage seems compatible with success.

Reconstruction of rectovestibular lacerations was performed in a standing position under the effect of caudal epidural anesthesia with all structures supported in proper relation. These findings agree with that reported by Farag *et al.* (2000) and Mosbah (2012).

However, some studies (Walker and Vaughan, 1880; Saleh *et al.*, 1988; Saini *et al.*, 2013) used dorsal recumbency under effect of general anesthesia. Adams and Fessler (2000) mentioned that dorsal positioning of the cases completely distorted the anatomical relations, and is thus not recommended.

For the success of this surgery, proper selection of the suture material is fundamental. Vicryl (polyglactin 910) is a strong, delayed absorbable and synthetic suture with excellent tissue compatibility. Various suture materials have been used for repair of third-degree rectovestibular lacerations such as monofilament nylon (Stickle *et al.*, 1979), chromic cat gut (Colbern *et al.*, 1985), polyglycolic acid (Shokry *et al.*, 1986; El-Seddawy, 1993), polydioxanone (Karrouf and Zaghoul, 2003; Mosbah, 2012) and polyglactin 910 (Farag *et al.*, 2000; Mehrjerdi *et al.*, 2010).

The success of the surgical repair of the third-degree rectovestibular laceration depends on whether the dissection was sufficiently deepened into sides of the defect to free a thicker rectal and vestibular flap on each side that could be brought together in the midline without any tension. This finding coincides with that reported by Walker and Vaughan (1980), Karrouf and Zaghoul (2003) and Mosbah (2012). They reported that a commonly encountered error was to make division of the tissue planes too shallow. This resulted

in excessive tension on the edge of the tissue when they were brought into apposition by the suture causing either wound dehiscence or fistula formation.

There are multiple complications reported in the literature for the repair of third degree perineal laceration in mares. These include rectovestibular fistula, pneumorectum, complete dehiscence of the repair, constipation, tenesmus or reduced performance (Kazemi *et al.*, 2010; Mosbah, 2012). In the present study two mares showed complication of partial wound dehiscence at the anal sphincter that eventually recovered after surgery. However, Kazemi *et al.* (2010) did not report any complication in the seven mares repaired for third degree perineal laceration using one stage Goetze technique.

We concluded that the successful of the surgical interference in third-degree rectovestibular lacerations depend on the control of vaginal and uterine infection by uterine wash and using of one-stage six-bite suture with excessive continuation of dissection of vaginal shelf and rectal floor.

References

- Aanes, W.A. 1964. Surgical repair of third-degree perineal laceration and rectovaginal fistula in the mare. *J. Am. Vet. Med. Assoc.* 144, 485-491.
- Aanes, W.A. 1988. Surgical management of foaling injuries. *Vet. Clin. North Am. Equine Pract.* 4, 417-438.
- Adams, S.B. and Fessler, J.F. 2000. Third-degree perineal laceration repair. In: *Atlas of equine surgery*, 1st ed. Philadelphia, London, Toronto, Sydney: W. B. Saunders Co. pp: 241-244.
- Brinsko, S.P., Blanchard, T.L., Varner, D.D., Schumacher, J. and Love, C.C. 2011. *Manual of equine reproduction*, 3rd edition. Mosby, Inc., an affiliate of Elsevier Inc. pp: 65.
- Colbern, G.T., Aanes, W.A. and Stashak, T.S. 1985. Surgical management of perineal lacerations and rectovestibular fistulae in the mare: a retrospective study of 47 cases. *J. Am. Vet. Med. Assoc.* 186, 265-269.
- Dabas, V.S. and Sharma, V.K. 2011. New spiral suture technique to reconstruct third degree perineal laceration in Mare. *Indian Vet. J.* 88, 36-37.
- El-Seddawy, F.D. 1993. Surgical repair of perineal lacerations in mares and Friesian cows. *J. Egypt. Vet. Med. Assoc.* 534, 681-691.
- Emberston, R.H. 1990. Perineal lacerations. In: *White NA, Moore JN, editors. Current practice in equine surgery*. Philadelphia, PA: J. B. Lippincott. pp: 669-704.
- Farag, K.A., Berbish, E.A. and Ghoneim, I.M. 2000. A one-stage repair of third-degree rectovestibular lacerations in the mare: an experimental and clinical study. *J. Egypt. Vet. Med. Assoc.* 60(2), 143-151.

- Flower, M.E. 1960. The repair of perineal lacerations in the mare. *Proc. Am. Assoc. Equine Pract.* 6, 106.
- Ghamsari, S.M., Nejad, M.M.M. and Moradi, O. 2008. Evaluation of Modified Surgical Technique in Repair of Third-Grade Perineal Lacerations in Mare. *Iranian J. Vet. Surg.* 3, 71-76.
- Hall, L.W., Clarke, K.W. and Trim, A. 2001. Anaesthesia of the horse. In: *Veterinary anesthesia* 3rd ed. W.B Saunders, pp: 247- 307.
- Hospes, R. and Bleul, U. 2007. The effect of extended preoperative fasting in mares undergoing surgery of the perineal region. *J. Equine Vet. Sci.* 27, 542-545.
- Karrouf, G.I. and Zaghoul, A.E. 2003. Surgical correction of third-degree rectovestibular lacerations in equine. *Mansoura Vet. Med. J.* VI(2), 95-110.
- Kazemi, M.H., Sardari, K. and Emami, M.R. 2010. Surgical repair of third-degree perineal laceration by Goetz technique in the mare: 7 cases (2000-2005). *Iranian J. Vet. Res.* 11, 184-188.
- Mair, T., Love, S., Schumacher, J. and Watson, E. 1998. *Equine medicine, surgery and reproduction*. Philadelphia, PA: W. B. Saunders Co. pp: 177-179.
- McKinnon, A.O., Belden, J.O. and Vasey, J.R. 1991. Selected reproductive surgery of the broodmare. *Equine reproduction. A seminar for veterinarians*, 174. Sydney: Post Graduate Committee in Veterinary Science. pp: 109-125.
- Mehrjerdi, K.H., Sardari, K. and Emami, M.R. 2010. Surgical repair of third-degree perineal laceration by Goetz technique in the mare: 7 cases (2000-2005). *Iranian J. Vet. Res.* 11, 184-188.
- Mosbah, E. 2012. A modified one-stage repair of third-degree rectovestibular lacerations in mares. *J. Equine Vet. Sci.* 32, 211-215.
- Purohit, G.N. 2011. Intrapartum conditions and their management in the mare: A review. *J. Livestock Sci.* 2, 20-37.
- Saini, N.S., Mohindroo, J., Mahajan, S.K., Raghunath, M., Sangwan, V., Kumar, A., Anand, A., Singh, T. and Singh, N. 2013. Surgical management of third degree perineal laceration in young mares. *Indian J. Anim. Sci.* 83(5), 525-526.
- Saleh, M.S., Gohar, H.M., El-Keiey, M.T., Ibrahim, I.M. and Abdel-Hamid, M.A. 1988. Reconstruction of a third-degree rectovestibular laceration in an Arabian mare. *J. Egypt. Vet. Med. Assoc.* 48(4), 629-635.
- Shokry, M., Ibrahim, I.M., Ahmed, A.S. and Abdel-Hamid, M.A. 1986. Preferred suture material in repair of rectovestibular lacerations in mares. *Modern Vet. Pract.* 67, 546.
- Stickle, R.L., Fessler, J.F. and Adams, S.B. 1979. A single-stage technique for repair of rectovestibular lacerations in the mare. *Vet. Surg.* 8, 25-27.
- Vaughan, J.T. 1974. Reconstructive surgery of the perineum, rectum and vagina. In *textbook of large animal surgery*. Williams and Wilkins, Baltimore; pp: 498-505.
- Walker, D.F. and Vaughan, J.T. 1980. Repair of third-degree perineal lacerations. In: Walker DF, Vaughan JT, editors. *Bovine and equine urogenital surgery*. Philadelphia, PA: Lea and Febiger. pp: 201-210.
- Woodie, B. 2006. The vulva, vestibule, vagina and cervix. In: Auer JA, Stick JA, editors. *Equine surgery*, 3rd ed. Philadelphia, PA: W.B. Saunders Co. pp: 845-852.