

Scientific Report

Surgical repair of third-degree perineal laceration by Goetz technique in the mare: 7 cases (2000-2005)

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Summary

Third-degree perineal lacerations in 7 mares were repaired surgically by a one-stage method (Goetz technique). Primary healing occurred in all of them without any complication. The conception rate obtained after surgery was 70.1%. Five horses out of seven got pregnant after surgery and no further injury was seen at subsequent foaling. Three mares have produced several healthy foals without any subsequent injury. According to the results of the present study, single-stage surgical repair of third-degree perineal laceration (Goetz technique) appeared to have a good prognosis for subsequent fertility in mares.

Key words: Perineal lacerations, Mare, Surgical technique, Goetz technique

Introduction

Perineal lacerations typically occur during unassisted foaling, and primiparous mares are particularly susceptible to injury during parturition. The prominence of the vestibulovaginal sphincter and remnants of the hymen in mares foaling for the first time are responsible for most of these injuries. The foal's hooves catch on the dorsal transverse fold of the vestibulovaginal junction, and the mare's abdominal press during parturition forces the foal's foot into the roof of the vestibule (LeBlanc, 1999; Woodie, 2006). These injuries are classified into first-, second-, and third-degree lacerations, according to the extent and severity of tissue damage. First-degree perineal lacerations involve only the skin and mucosa of the vagina or vestibula. Second-degree perineal lacerations involve vestibular mucosa and submucosa, skin of the dorsal commissure of the vulva, and perineal body musculature, including the constrictor vulva, but there is no damage to rectal mucosa. Third-degree perineal lacerations occur when there is tearing

through the rectovestibular septum, musculature of the rectum and vestibule, and the perineal body (LeBlanc, 1999; Woodie, 2006; Hendrickson, 2007). The concern is that loss of functional vulvar and vestibular conformation of the vaginal vault eventually lead to infertility through endometritis. So, reconstruction of third-degree perineal laceration is necessary to return the mare to breeding soundness (Woodie, 2006; Hendrickson, 2007). Although some authors recommend immediate repair of third-degree perineal laceration (Delahanty, 1968), others claim that second intention healing for at least 4-6 weeks should be passed before surgical intervention (Desjardins *et al.*, 1993; LeBlanc, 1999; Woodie, 2006). Devitalized tissue, inflammation and surrounding edema, combined with faecal contamination of the area, probably contribute to the failure of initial surgical repairs (Aanes, 1964; Desjardins *et al.*, 1993; Adams and Fessler, 2000; Schonfelder and Sobiraj, 2004; Woodie, 2006; Hendrickson, 2007). Several methods and modifications of techniques for repair of third-degree perineal lacerations have been

published (Aanes, 1964; LeBlanc, 1999). The main principle of all procedures is the reconstruction of the shelf between the rectum and vestibule or vagina and the restoration of a functional perineal body. Third-degree perineal lacerations are most commonly repaired by either the Goetz one-stage or the Aanes two-stage technique or by slight modifications of the previous mentioned methods (Phillips and Foerner, 1998; LeBlanc, 1999; Woodie, 2006). The purpose of this report is to present information on the single-stage repair techniques (Goetz technique) used for treatment of third-degree perineal laceration in mares.

Materials and Methods

This report involved 7 mares admitted to the Ferdowsi University of Mashhad, Veterinary Teaching Hospital for delayed repairs of a third-degree perineal laceration between February 2000 and September 2005. The mares ranged in age from six to twelve years (mean = 7.85 ± 2.11 years), included two thoroughbred and five mix breeds. Rectovaginal laceration had occurred during parturition and all mares were primiparous. Follow-up information had been obtained during re-examination of the patients from surgery to some years after that (Fig. 1).



Fig. 1: Third-degree perineal laceration approximately 3 months postfoaling that is ready for surgical repair



Fig. 2: The six bite suture pattern used to apposed vaginal and rectal flaps

Feeding was withheld from 48 h before up to three days after surgery, during fasting time; fluids of ringer lactate and dextrose solution were given. On day 3 after operation, feeding was started with alfa-alfa hay and mineral oil for 10 days. Procaine penicillin G (20000 IU/kg twice daily) and flunixin meglumine (1.1 mg/kg, IV once daily) were administered preoperatively and continued for five and three subsequent days after surgery, respectively.

Mares were restrained in stock and sedated with xylazine Hcl (0.5 mg/kg, IV) (Rompun, alfasan, Woerden-Holland). Caudal epidural anesthesia was induced and faecal material from the rectum, vagina and vestibule was removed manually. After preparation of the perineal region, Goetz technique (single-stage repair) was used for suturing and closure of the laceration (Fig. 2). Briefly, two towel clamps were placed in the vulva and an incision was made along the scar tissue line marking the junction between the vestibule/vagina and rectum mucosa. After removing the scar tissue, ventral and dorsal tissues to the incision line were dissected to create vestibular and rectal shelves, respectively. A six-bite suture pattern with No. 2 Vicryl (Vicryl, ETHICON) suture material was used for suturing these layers together from cranial toward the vulva (4 cm cranial to the cutaneous perineum). The operation was completed by reconstruction of the perineum by suturing the skin and subcutaneous tissues. A routine caslick's operation was then performed to get a better conception

Table 1: Breeding and fertility information from 7 mares after Goetz technique

Mare No.	Age	Breed	Length (cm)	Interval between parturition and repair	Interval between repair and breeding	No. of foaling after surgery	Result
1	7	Mix	17	8 months	19 months	1	Pregnant
2	8	Mix	13	5 months	6 months	2	Pregnant
3	6	Thoroughbred	9	3 months	2.5 months	3	Pregnant
4	6	Mix	10	2 months	8 months	0	Barren
5	7	Mix	12	6 months	16 months	0	Barren
6	9	Mix	6	6 months	4 months	2	Pregnant
7	12	Thoroughbred	7	7 months	4 months	1	Pregnant

rate in the mares. Following healing, the mares were examined for endometritis and treated accordingly.

Results

The mean length of the laceration in the 7 mares was 10.5 ± 3.77 cm (range, 6-17 cm). All owners were comfortable performing the daily wound care and were satisfied with the outcome of the procedure. Following surgery, mild swelling in the perineal region was noticed in all mares. Postoperative complications included tenesmus and constipation.

Third-degree perineal lacerations in 7 mares were repaired successfully and perineal conformation was improved by the surgical technique. Fistula formation and dehiscence of the repair were not observed after operation. Five out of 7 mares have foaled at least once, or are pregnant now. The conception rate obtained after operation was 70.1%. Pregnant mares delivered normally and dehiscence of the suture line was not observed at the subsequent parturition. The breeding and fertility results obtained after operation are presented in Table 1.

Discussion

The repair of the third-degree perineal laceration using a Goetz technique seemingly offered considerable promise for fertility in mares in our study. Also, dehiscence of the surgical wounds did not occur after surgery in our cases.

Important considerations for surgical management of the perineal laceration include the timing of the operation and the severity of the tissue damage, particularly with lacerations involving the rectum. The management is divided into two parts:

immediate treatment and delayed surgical repair (Woodie, 2006). Preoperative and postoperative management of faecal consistency is considered important in perineal surgery in mares. The faeces must remain soft for at least 2 weeks following repair to minimize the pressure required for defecation and thus minimize stress on the suture line (Schonfelder and Sobiraj, 2004; Hospes and Bleul, 2007). A great number of apparently successful feeding and laxative regimens have been reported (Colbern *et al.*, 1985; Vaughan, 1986). These range from dietary measures that result in soft but not fluid faeces to complete fasting of the mare for 5 days preoperatively to 4 days postoperatively (Kersjes *et al.*, 1986; Aanes, 1988; Hospes and Bleul, 2007). In our report, a fasting period up to 5 days and feeding with alfa-alfa hay and mineral oil for 10 days did not result in any dramatical changes in the general condition of the mares and dehiscence of the suture line did not occur. Even prolonged fasting has been recommended to reduce the passage of faeces after operation. Some investigators have recommended a preoperative fasting for 9-10 days and a postoperative fasting for 4 days (Kersjes *et al.*, 1986; Kasikci *et al.*, 2005). Reservations have been expressed concerning the latter, because prolonged fasts predispose animals to enteritis and diarrhea (LeBlanc, 1999). In a recent study in 15 mares, it was found that the gastrointestinal tract as well as general body metabolic activity of mares appears to be well adapted to withstanding long periods of fasting. However, in that study, surgery was successful in 33 percent of cases. Catabolic effects of the long fasting period, which could adversely affect wound healing, may be the main reason for this phenomenon. Therefore, it was recommended by the authors that during extended fasting, partial or total parenteral nutrition may be useful

(Hospes and Bleul, 2007). Although management of faecal consistency remains important for any surgical method for third-degree perineal laceration, methods to decrease wound tension after surgery should also be of benefit in optimizing healing (Schonfelder and Sobiraj, 2004).

Complications of the used methods for repair of the third-degree perineal laceration include rectovaginal fistula formation, urine pooling, complete dehiscence of the repair, constipation, tenesmus and difficulty of performance in the practice. Wound dehiscence is the most common and serious complication to third-degree perineal laceration repairs, and occurs with all techniques. In our report, third-degree perineal lacerations were repaired successfully by Goetz method, and dehiscence of the suture line and fistula formation did not occur.

Advantages of a single surgery over a two-stage repair, in which the second phase is done 2-4 weeks later, include less hospitalization, less preoperative and postoperative care and a single surgical procedure. However with two stage-repairs, because the anal orifice is larger, the mare can defecate more easily. Also, there is less chance of the rectum's becoming impacted and the mare's straining to defecate, leading to dehiscence or fistulation of the repair (LeBlanc, 1999).

Endometrial inflammation has been shown to subside within 2 weeks of repair. Studies have shown that postoperative fertility of the mare could be improved and 75% of mares are able to successfully carry a foal after surgical repair of third-degree perineal laceration (Adams and Fessler, 2000; Hendrickson, 2007). In our report, a pregnancy rate of 70.1% was achieved in the mares that had undergone surgery, suggesting that surgical repair is indicated in any mare with sufficient genetic potential.

Mares that have undergone surgical repair are predisposed to reinjury on subsequent foaling; the amount of trauma is variable, ranging from no injury to another third-degree perineal laceration. However, clinical experience indicates that the incidence of recurrence is low (Kasikci *et al.*, 2005; Hendrickson, 2007). In our report, none of the mares that produced foals after

the initial injury suffered a perineal laceration at subsequent foaling.

In summary, numerous surgical techniques and modifications of techniques can be used to successfully repair third-degree perineal laceration. According to the results of the present study, single-stage surgical repair of third-degree perineal laceration appeared to have a good prognosis for subsequent fertility in mares.

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