

## Evaluation of Modified Surgical Technique in Repair of Third-Grade Perineal Lacerations in Mare

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### Abstract

**Objective-** introduce and evaluate modified surgical technique in repair of third grade perineal lacerations in mares.

**Design-** descriptive study.

**Animals-** ten mares.

**Procedures-** The tissue between rectal and vagina mucosa was incised in the way that the lower rectal mucosa was entirely separated from upper vaginal mucosa and a flap was consequently induced in both sides. The septum between rectum and vagina was sutured by a six bite pattern at the same time with simple interrupted suturing of rectal mucosa using 0 vicryl. The skin of the perineal body was closed with 1 or 2 absorbable or nonabsorbable suture material in a horizontal mattress pattern.

**Results-** The observations of surgical region during a month after surgery demonstrated that there were no signs of complete dehiscence, partial dehiscence and rectovestibular fistula. and primary healing had effectively occurred.

**Conclusion and Clinical Relevance-** As the lesion recovered completely and there were no signs of fistula, rectal stenosis and reversion to pneumovagina, it is advisable to use this modified method for laceration.

**Key Words-** Mare, Perineal Laceration, Six Bite Pattern.

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## **Introduction**

Rectovaginal lacerations occur in many species but are reported to be more common in mares than in most domestic animals.<sup>1</sup> Most injuries occur at the time of foaling, either as a result of an oversize or malpositioned fetus or because of excessive manipulation during assisted delivery. Although minor injuries or lacerations to the perineum do not require surgery, others will affect reproductive performance and require surgical correction. Damage from majority of foaling injuries is restricted to the vulva and vestibule. Lacerations that occur at parturition have been classified based on their extent in to first, second and third grade laceration.

First grade laceration involves only mucosa of the vestibule and skin of the dorsal commissure of the vulva. Second grade lacerations involve vestibular mucosa and submucosa and continue into the muscle of the perineal body including the constrictor vulvae muscle. These injuries do not involve the anal sphincter or rectum. This injury compromises the closure of the labia, predisposing the mare to pneumovagina. Third-grade lacerations are complete disruptions of the rectovestibular shelf, penetrating the rectum, perineal body and anal sphincter. This injuries result in a common opening between the rectum and the vestibule.

First grade injuries typically do not require surgical intervention. If needed, a caslick procedure can be performed. Repair of second grade injuries require a caslick procedure and reconstruction of the perineal body. The mare will develop a sunken perineum and be predisposed to penumovagina and urovagina if the perineal body is not reconstructed. All third grade perineal lacerations required surgical repair. The management is dividing into two parts: immediate treatment and delayed surgical repair.<sup>2</sup> Repair of a third grade laceration in the acute stage should not be attempt. The tissue is very edematous and contaminated with feces, and some tissues may not be viable. Repair should be delayed at least 4 to 6 weeks or longer if possible, to allow healing of the injured tissues. Initial therapy should include daily wound care and cleaning of the contaminated tissues. Third grade perineal lacerations and rectovestibular fistulae threaten future performance as athlete and brood mare because of loss of the barrier between the vestibule and the rectum. Fecal contamination of the reproductive tract commonly results in vaginitis and endometritis, and loss of the constrictor vulva muscle or a functional rectal sphincter, or both, causes the horse to be a "wind sucker" during exercise. In addition to the unattractive noise, wind sucking also can lead to pneumovagina and further cranial dissemination of bacteria introduced through the vulva and the rectovestibular defect.

Numerous surgical techniques and modifications of techniques for the repair of perineal lacerations have been reported, including the Goetz (one-stage) and the Anes (two-stage) procedures and by slight modifications of the two. In this study modified six bite pattern in 10 mares with third grade rectovaginal laceration was evaluated.

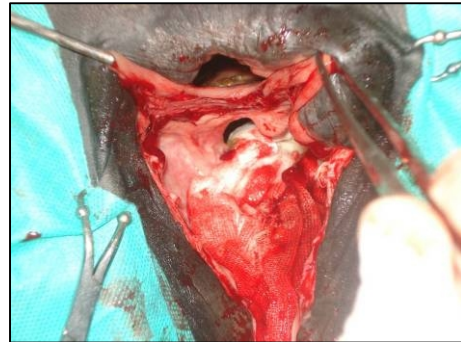
## **Materials and Methods**

10 mares with third grade rectovaginal laceration were used in this study. Four of 10 mares had one and three mares had two unsuccessful surgeries. In other mares, surgery for the first time was performed. The surgery was delayed in all horses until second intention healing of the rectovaginal wound had occurred. The feces should be soft and this can be accomplished in fourth cutting alfalfa hay, and so on for at least 1 week prior to surgery. Most of the mares were off feed for 24 hours before surgery.

Horses were operated on the standing position by using sedation and epidural anesthesia with xylazine and lidocaine, respectively. The tail was held out of the surgical field by a rope tied to the halter. Fecal material was evacuated from the rectum and vagina, and the field was prepared with povidine iodine solution. The anus, perineum, and vulvar lips were retracted with stay suture or towel clamps (Fig. 1). Initial dissection begins cranially in a frontal plane at the level of the rectovestibular shelf. Thumb forceps can be used to place tension on the rectovestibular shelf to facilitate dissection. A combination of sharp and blunt dissection was used to divide the tissue into rectal and vestibular shelves. The rectal shelf should be made up of two thirds of the thickness, and the vestibular shelf one third. The plane of dissection was continued cranially for a distance of 3 to 5 cm (Fig. 2).



**Figure1.** The surgical field prepared for surgery.



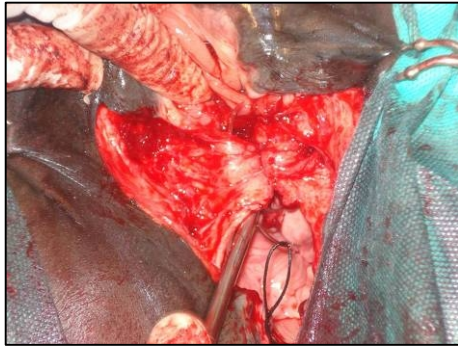
**Figure2.** Vestibular and rectal tissue flaps are created by dissecting along the line of scar tissue.

The cranial dissection was important to relieve tension at the tissue edges. The incisions were continued laterally and caudally through the scar tissue that has formed at the junction of the rectal mucosa and the vestibular mucosa. The dissection is continued laterally until the tissue shelves can be opposed on the midline without tension. Once sufficient dissection has been achieved, reconstruction of the tissue shelves commenced. The septum between rectum and vagina was sutured by a six bite pattern using no 2 nonabsorbable suture material (Fig. 3) at the same time with simple interrupted suturing of rectal mucosa using 0 vicryl (Fig. 4). The skin of the perineal body was closed with 1 or 2 absorbable or nonabsorbable suture material in a horizontal mattress pattern (Fig. 5).

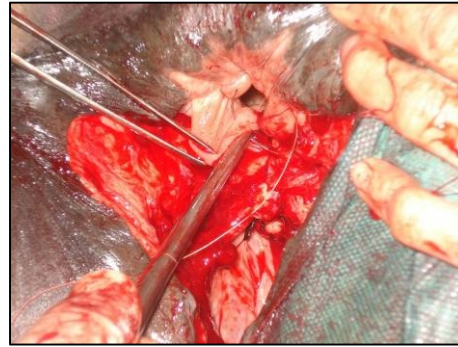
Procaine penicillin G (20,000 IU/kg intramuscularly BID) was administered for 3 to 4 days and nonsteroidal anti-inflammatory drugs (NSAID), flunixin meglumine (1 mg/kg intravenously BID) for 7 days were administered. Postoperatively, temporary atonia of the rectum, pain, or solid feces can cause constipation and increased exertion for defecation may cause dehiscence. To prevent this, it is important to manage diet, administer analgesic therapy and if needed careful manual evacuation of the rectum. Thus the owner is advised to continue the soft stool diet for 1-2 weeks. The sutures were removed in approximately 15 days after surgery.

## Results

The observations of surgical region during one month after surgery demonstrated that there were no signs of complications include: rectovaginal fistula formation, urine pooling, complete dehiscence, constipation, tenesmus and difficulty of performance in the practice. Primary healing had effectively occurred in all of the mares.



**Figure 3.** The Rectovestibular septum was apposed with interrupted six bite suture patterns.



**Figure 4.** The simple interrupted suture pattern used to appose rectal mucosa.

## Discussion

For many years, Goetz method was used for different grade of perineal lacerations. Primary healing in 82% of the cases after the single stage repair has been reported.<sup>4</sup> The result was satisfactory, although it caused severe pain and consequent constipation due to resistance to evacuation in some cases. This method was modified by Anes in which rectum and vagina was separated by a new layer of tissue without additional tension on stitch lines with emphasizing on having two stages of operation. Primary healing in 75% of the cases after the two stage repair has been reported.<sup>4</sup> Various methods have been described with differences in number of surgical stages or suture material and also the pattern of stitching.<sup>3</sup> A one stage repair of third grade perineal lacerations and rectovestibular fistulae in 17 mares by Belknap and nickels have been reported.<sup>1</sup> Primary healing occurred in 14 mares; there were one complete dehiscence and two partial dehiscence with fistula formation. Two mares had each produced one unthrifty foal. One mare repeatedly aborts in the first trimester. Four mares have produced several healthy foals with no further problems. One mare suffered further perineal trauma while foaling. Semitransverse closure technique for the repair of perineal lacerations in the 52 mares by Philips and Foerner has been described.<sup>5</sup> In this retrospective study, primary repair and healing was achieved in 29 of the rectovaginal tears. This represented a primary healing rate of 29/32 (90.6%). A vaginal mucosal pedicle flap technique for repair of rectovaginal fistula in mares by schonfelder and sobiraj has been reported.<sup>5</sup> In this study two RVF healed by 1<sup>st</sup> intention whereas for the 3<sup>rd</sup> RVF, 2 additional single sutures were required to repair partial dehiscence after 10 days. At 6 weeks and 6 months all RVF were healed. Comparison of endometrium before and after repair of third grade rectovestibular lacerations by Schumacher and Blanchard in 8 mares with third grade rectovaginal lacerations were obtained immediately before surgery and from 9 to 15 days after repair.<sup>6</sup> Presurgical endometrial biopsy specimens were classified as category one for 2 mares; category two, attributable to slight endometritis, for 5 mares; and category



**Figure 5.** The skin of the perineal body was closed with 1 or 2 absorbable or nonabsorbable suture material in a horizontal mattress pattern

three, attributable to moderate to severe endometritis, for 1 mare. Within 15 days after rectovestibular repair, all endometrial biopsy specimens were classified as category one. Results indicated that mares with third grade rectovestibular injuries were candidates for breeding by artificial insemination by 2 weeks after repair of the injury.

Rectovestibular surgery is well known for the complications discussed, regardless of the technique used. The rectal mucosa was sutured by some surgeons because it was felt that apposition of the mucosa with only the six bite suture pattern was not adequate to prevent leakage of fecal material into the deeper tissues.<sup>1</sup>

According to findings of previous studies, the most advisable method for repairing rectovaginal lacerations is surgery.<sup>1,4,5</sup> In this study the observations of surgical region during one month after surgery demonstrated that there were no signs of complete dehiscence, partial dehiscence and rectovestibular fistula. Primary healing had effectively occurred. As the lesion recovered completely and there were no signs of fistula, tenesmus and reversion to pneumovagina, it is advisable to use this modified method for third grade rectovaginal laceration. It should be noted that half of the mares in the study had some unsuccessful surgeries, thus the method would be also applied in healing of chronic lesions. The results of the study showed that the advantage of the suggested modification of the described technique provided appropriate tension in sutured closure.

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## ارزیابی یک روش جراحی تغییر یافته برای ترمیم پارگی درجه سه رکتوواژینال در مادیان

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**هدف** - معرفی و ارزیابی روشی تغییر یافته در ترمیم پارگی درجه سه رکتوواژینال مادیان.

**طرح مطالعه** - مطالعه توصیفی.

**حیوانات** - 10 راس مادیان.

**روش کار** - از حد واسط بین مخاط رکتوم و واژن برشی داده شد بطوریکه مخاط کف رکتوم کاملاً از مخاط سقف واژن جدا شده و فلاپ در دو طرف ایجاد شد. دیواره بین رکتوم و واژن با الگوی بخیه شش بایتی و همزمان با آن مخاط کف رکتوم با بخیه تک ساده و نخ نمره صفر ویکریل بسته شد. پوست ناحیه پرینه با نخ نمره 1 یا 2 قابل جذب یا غیر قابل جذب با الگوی تشکی افقی بسته شد.

**نتایج** - بررسی های صورت پذیرفته تا یک ماه پس از جراحی حاکی از موفقیت ترمیم اولیه وعدم هرگونه اختلال در ناحیه مذکور داشته است.

**نتیجه گیری و کاربرد بالینی** - از آنجا که در مطالعه حاضر بهبودی کامل ضایعه مشاهده شد و علایمی ناشی از بروز فیستول، تنگی رکتوم، بازگشت پنومواژن وجود نداشت، این روش تغییر شکل یافته برای ترمیم این نوع پارگیها توصیه می گردد.  
**کلید واژگان** - مادیان، پارگی رکتوواژینال، الگوی بخیه شش بایتی.