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Case Report

Traumatic Membranous Urethral Rupture in a Foal: A Case Report

İbrahim AKIN[1], Cahit Gürsel BELLEK[1], Burak Bulut[1], Nuh KILIÇ[1], Yalçın Alper ÖZTURAN[1*]

[1]*Aydın Adnan Menderes University, Faculty of Veterinary Medicine, Department of Surgery, 09100, Işıklı/Aydın, TURKEY*

ABSTRACT

Urethral ruptures can be a life-threatening emergency that may lead to fatal uroperitoneum. This case report aimed to describe the clinical findings and treatment results of a traumatic membranous urethral rupture in a 15-day-old Ambling foal. The foal had been wounded by a wild animal 9 days before, and despite treatment, the foal's condition worsened, the owner brought the animal to Faculty of Veterinary Medicine Research and Practice Animal Hospital. On physical examination several wounds in the pubic and inguinal regions were identified, some of which were complicated by a fistula. Vital parameters of the foal were not in reference ranges. In laboratory findings, lymphopenia, eosinopenia, mild anemia, and decreased partial oxygen pressure with acidic blood pH were observed. Sutures were applied surgically under general anesthesia to the urethral tear and wound care was provided. On the fifth day after surgery, the owner called the hospital to report that the foal was constipated and had signs of colic. Per rectal olive oil usage was recommended, and surgery was re-planned for the following day. Despite cardiac resuscitation and emergency treatments, the foal died during the operation due to cardiac arrest. In conclusion, gastrointestinal outcomes of surgery and anesthesia must be considered.

Keywords: Foal, horse, urethra, rupture

Bir Tayda Travmatik Membranöz Üretra Rupturu: Vaka Raporu

ÖZET

Üretral rupturlar üroperitona yol açabilen hayatı tehdit eden bir acil durum olabilmektedir. Bu olgu sunumu, 15 günlük bir rahvan ırkı tayda travmatik membranöz üretra rupturunun klinik bulguları ve tedavi sonuçları hakkında bilgi vermeyi amaçlamıştır. Dokuz gün önce vahşi bir hayvan tarafından yaralanan tay, uygulanan tedaviye rağmen durumu ağırlaşınca sahipleri tarafından Veteriner Fakültesi Araştırma ve Uygulama Hayvan Hastanesi'ne getirildi. Yapılan fiziki muayenede tayın kasık ve inguinal bölgelerinde bazıları fistülle komplike olmuş birkaç yara tespit edildi. Tayın rektal vücut sıcaklığı, kalp atım hızı, solunum frekansı ve kapiller dolum zamanının düşük olduğu gözlendi. Laboratuvar bulgularında lenfopeni, eozinopeni, hafif anemi, asidik kan pH'sı ile parsiyel oksijen basıncının düştüğü gözlendi. Üretra yırtığına dikiş atıldı ve açık yaralara yara bakımı yapıldı. Ameliyattan sonraki beşinci gün, sahibi hastaneyi arayarak tayın kabız olduğunu ve kolik belirtileri olduğunu bildirdi. Rektal zeytinyağı kullanımı önerildi ve ertesi gün için ameliyata karar verildi. Kardiyak resüsitasyon ve acil tedavilere rağmen tay, operasyon sırasında kalp durması nedeniyle kurtarılamadı. Sonuç olarak, sindirimi ilgilendirmeyen cerrahi operasyonlarda bile cerrahi ve anestezik prosedürlerin gastrointestinal kanal üzerindeki sonuçları göz önünde bulundurulmalıdır.

Anahtar kelimeler: Tay, at, uretra, ruptur

Corresponding Author: Yalçın Alper ÖZTURAN, Aydın Adnan Menderes University, Faculty of Veterinary Medicine, Department of Surgery, 09100, Işıklı/Aydın, TURKEY. Phone: +90 506 503 79 25. e-mail address: y.alper.ozturan@adu.edu.tr.

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Introduction

Ruptures in the lower urinary tract may have a life-threatening emergency that may result in uroperitoneum. Urinary tract rupture is less common in horses (Schott and Woodie, 2012). A urethral laceration is most encountered in horses in the penile or extra-pelvic urethra due to its superficial location and vulnerability to trauma (Schott and Woodie, 2012). Uroperitoneum (Richardson and Kohn, 1983; Adams et al., 1988; Lavoie and Harnagel, 1988; Kablack et al., 2000; Dunkel et al., 2005), urachal abscess and ruptures (Hyman et al., 2002), and congenital anomalies of ureters has been widely reported in previous studies (Robertson et al., 1983; Divers et al., 1988; Cutler et al., 1997; Jean et al., 1998; Morisset et al., 2002). Despite reports of urethral and bladder rupture in foals (Castagnetti et al., 2010; Oreff et al., 2015), little is known about a membranous urethral rupture in newborn foals. This case report describes the surgical approach and therapy used to treat a foal with urethral rupture.

Case History and Clinical Findings

Fifteen days old, an Ambling male foal weighing 30 kg was brought to the Aydın Adnan Menderes University, Faculty of Veterinary Medicine Research and Practice Animal Hospital because of a wild animal attack. The foal had a normal delivery and was healthy until the day of the wild animal attack occurred based on the claim of the owner. A freelancer veterinarian was applied wound care (10% povidone-iodine emulsified gauze dressing), flunixin meglumine (50 mg/kg, i. m., q. d.), and penicillin G sodium (20,000 IU/kg, i. v., q. 6h) injections and referred the foal to the hospital after 9 days. The foal was depressed and weak in the physical examination (Figure 1a). Rectal temperature, heart rate, respiration rate, and capillary refill time were low (28 bpm, 37.3°C, 10 breaths/min, and 4 seconds, respectively). Several wounds on the pubic and inguinal regions were found (Figures 1b-d). Two of the wounds had fistulae, and the discharge was slightly yellow. One of the wounds measured over 12 cm horizontally, parallel to the penis, and was filled with urine. Urine discharge was observed from one of these wounds. Jugular venous and arterial blood samples were obtained. On complete blood count and blood gasses analysis lymphopenia, eosinopenia, decreased partial oxygen pressure, decreased blood pH and mild anemia was detected.

Anesthesia was induced with xylazine HCl (0.6 mg/kg, XylazinBio® %2, Bioveta PLC, Ivanovice na Hane, Czech Republic) and ketamine HCl (1.5 mg/kg, Ketasol® %10, Richter Pharma Ag, Wels, Austria) i. v. and maintained with 1.5% isoflurane (Isoflurane USP®, Adeka Ilac, Istanbul, Turkey) in 100% oxygen as a standard anesthesia protocol of the hospital. The foal was placed in a dorsal recumbent position, and the ventral aspect of the abdominal wall was clipped and prepared aseptically for surgery (Figure 1c). A 5-centimeter-long urethrotomy was performed near the wound's medial margin (Figure 1d). A sterile 14 French Foley catheter was placed through the urethra and secured in place with a single purse-string suture for ensuring urine drainage (Figure 1e). The urethral defect, subcutaneous tissues, and skin were closed separately with 2-0 USP monofilament Polyglecaprone 25 (Monocryl®, Ethicon Inc., Raritan, New Jersey, United States) in a simple continuous partial-thickness suture (Figure 1f-n). Sterile gauzes were inserted as a drain for fistulated open wounds. Procaine penicillin (8 mg/kg, q. d., i. m.) and streptomycin (10 mg/kg, q. d., i. m.) injections and local ether iodoform (q. d.) were prescribed for postoperative 7 consecutive days. During anesthesia recovery, the foal's vital signs were normal, and the animal was discharged 4 hours after the surgery. Flunixin meglumine (50 mg/kg, i. m., q. d.) was prescribed post-operatively. The owner called the hospital on the evening of the fifth day after the operation to report that the animal had not defecated for five days and was showing signs of colic (biting and kicking its flank, frequently looking at its side, and poor eating behavior). Rectal use of olive oil was recommended to the owner for constipation. The same night, the owner called the hospital again and reported urine leakage from the treated wound areas;

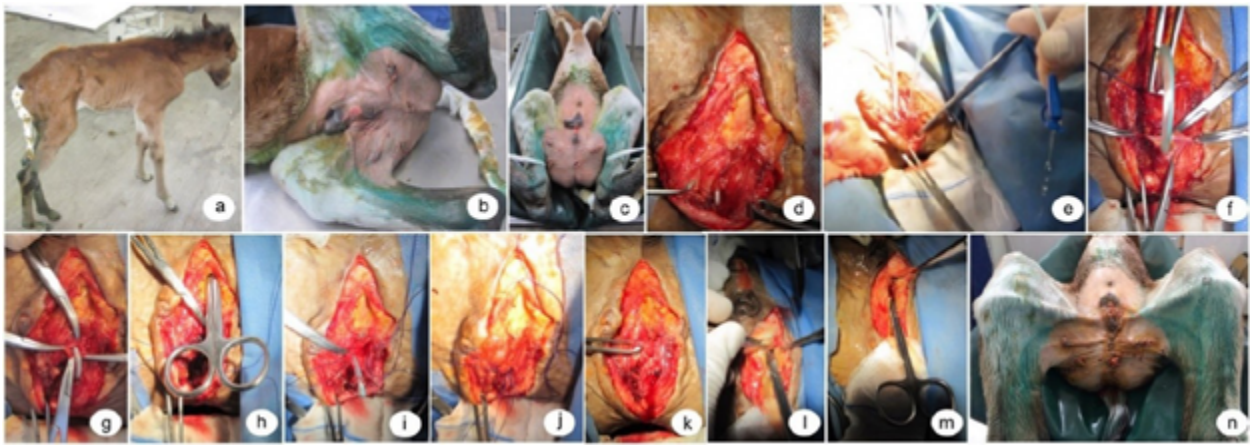

Figure 1. The foal's physical appearance prior to surgery pre-operative preparation and findings, intraoperative interventions, and post-operative photograph of the operation site.
a= prior to surgery; b and c= pre-operative preparation and findings; d, e, f, g, h, I, j, k, l, and m= intraoperative interventions; n= post-operative photographs.

the foal was planned for reoperation the next morning due to wound dehiscence. Vital signs of the foal (rectal temperature, heart rate, femoral pulse, capillary refill time, and respiratory rate) were within reference ranges. Mild anemia and increased white blood cell count were detected. The animal was anesthetized according to the same procedure. Cardiac arrest occurred in operation. The foal couldn't be saved despite cardiac resuscitation and emergency interventions.

Discussion

This case report describes a membranous urethral rupture that resulted in the animal's death due to a postoperative complication.

Urethral rupture is rare in humans, small animals, and horses (Anderson et al., 2006; Meige et al., 2008; Schott and Woodie, 2012). Furthermore, the solitary indicative clinical symptom of urethral rupture is sometimes noticeable soft tissue swelling in the surrounding tissue, which can be difficult to diagnose (Schott and Woodie, 2012). Even though 9 days had passed since the wild animal attack, the diagnosis of urethral tear was made by visual observation of urine discharge from wound sites, aside from the fact that urine retention was found in the abdomen, complete blood count did not reveal azotemia, and none of the clinical signs related to azotemia was noted. Urine leakage from distal urethral areas tends to have fistulae, and the animal may have milder azotemia-related systemic symptoms (Boothe, 2000). In the present case report, the existence of wounds in the animal's caudal abdominal and inguinal regions, as well as loss of preputial integrity, suggested the presence of urethral rupture, and the diagnosis was made by observing urine leakage from the wounds.

An indwelling urinary catheter and therapy for fluid-electrolyte and acid-base abnormalities can be used as a conservative treatment for the urethral tear (Boothe, 2000; Schott and Woodie, 2012). For more severe urethral injuries, surgical management is required, which requires gentle manipulation of the surgical site, ensuring blood circulation, and precise tissue apposition (Boothe, 2000; Schott and Woodie, 2012). Urine contamination in the periurethral tissues causes periurethral fibrosis and late wound healing (Anderson et al., 2006). When urine is rerouted away from the surgical site or the site of injury, the uroepithelium can bridge a defect in 3–21 days (Anson, 1987; Holt, 1989). The urinary tract diversion approach was highlighted in a study on dogs and cats (Anderson et al., 2006). Castagnetti et al. (2010) reported that urethra and bladder rupture in a foal was repaired by suturing the wounds and tears. Also, they reported wound dehiscence as a postoperative complication (Castagnetti et al., 2010). Urine diversion by laparoscopic aided tube cystotomy was claimed to be a successful intervention in another similar report of urethral rupture in a foal after two attempts with no success to repair the tear by primary closure (Oreff et al., 2015). In the present report, the primary closure approach was used as a surgical attempt. However, the tear was dehiscence after 5 days of surgical intervention. The presence of constipation could be the consequence of dehiscence leading to increased pressure on the skin by colic. According to previous research, there is an intermediate clinical phase in horses after surgery unrelated to the gastrointestinal tract, which is characterized by decreased fecal output before observable signs of colic (Little et al., 2001).

In conclusion, even for urethral ruptures, constipation and colic may be postoperative complications of surgical intervention in foals. Postoperatively, gastrointestinal features should be closely examined, and fecal softeners may be recommended. Also, anesthesia protocol, pain management, and special diets may be considered.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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