Bezoars and Its Role in Small Colon Impaction

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Abstract

Case Description- In the autumn (2013), a 16 month female mixed Arabian foal with signs of acute abdominal pain and restlessness was referred to the department of clinical sciences. The case has presented signs of partially obstructive acute abdominal syndrome (AAS) characterized by intermittent pain episodes, increased physiological frequencies and decreased abdominal sounds.

Clinical Findings- Animal was clinically examined immediately after arrival to the clinic. Data of the history included information on previous colic diseases (no), previous abdominal surgeries (no), duration of disease (2 days), degree of abdominal pain (moderate colic) and treatment used before arrival [flunixin meglumin (IV) and ketofen (IM)]. The intensity of abdominal pain (moderate), heart rate (78/min), congested color of conjunctiva, peristalsis (poor), abdominal distension (mild), sweating (neck area) and the results of rectal examination were evaluated during the initial clinical examination. Diagnosis of a small colon impaction was made by rectal palpation. A heavy tube with loss of the normal sacculations and absence of normal formed fecal balls were considered which may indicate the occurrence of an obstruction in proximal part of small colon.

Treatment and Outcome- Medical management including nasal intubation, liquid paraffin (1 L) and xylazine hydrochloride (0.5 mg/kg IV) were performed and clinical evaluation was noticed for 3 next hours. During the time the heart rate was elevated and discomfort was noticed. Due to this reason abdominocentesis was performed and serosanguinous fluid was collected which means the presence of moderate bowel inflammation. At this time patients were referred to the surgical department, and fecalith was diagnosed during laparatomy.

Clinical Relevance- Generally females may also be at increased risk for small colon lesions, possibly because of hormonal fluctuations affecting gastrointestinal motility. Furthermore horses with diarrhea are 10 times more likely to develop a small colon impaction than horses without diarrhea which was not mentioned by owner in case history. In addition, bezoars are retained concretions of indigestible foreign material that accumulate and conglomerate in the gastrointestinal tract. Bezoars can be composed of virtually any substance including food (fecalith), hair (trichobezoars), and medications (Pharmacobezoars). Fecaliths are a common cause of colic in young horses and causes of the formation are probably similar to those of other impactions and include poor-quality roughage, dental disease and reduced water intake.

Key Words- Bezoar, Fecalith, Colic, Small colon, Impaction.

Case Description

A mix breed Arabian female horse with sixty month age was refered to the clinic of large animal internal medicine at November 2013. It had been showing symptoms of colic for the past two days. The animal had been eating very small portions of forage and concentrates and small amount of fæces had been seen. Treatment by the owner with flunixin meglumin (IV) and ketofen (IM) was unsuccessful. At the time of admission to the clinic the horse was suffered from moderate degrees of colic, restlessness, sweating, increased vital parameters and paddeling which similar to the signs of partially obstructive acute abdominal syndrome (AAS).

Clinical Findings

Data of the history included information on previous colic diseases (no) and previous abdominal surgeries (no). The heart rate of patient was 78 beats/min and the respiratory rate was 18 breaths/min with a marked restlessness. Auscultation of distended abdomen failed to reveal the presence of normal intestinal movements. The mucous membranes were congested and all blood values were within the normal range. Rectal examination showed the presence of heavy suspended and unpalpated portion with absence of normal formed fecal balls. Because of the palpable colon bands and the absence of severe symptoms, a diagnosis of an obstruction of the small colon was considered.
Treatment and Outcome

Medical management including nasal intubation, liquid paraffin (1 L) and xylazine hydrochloride (0.5 mg/kg IV) were administered and clinical evaluation was noticed for 3 next hours. During the time the heart rate was elevated and
discomfort was noticed. Due to this reason abdominocentesis (Fig. 1) was performed and serosanguinous fluid was collected which means the presence of moderate bowel inflammation. At this time patients were referred to the surgical department, and fecalith was diagnosed during laparotomy (Fig. 2 & 3).

Clinical Relevance

Colic resulting from a problem with the small colon is comparatively rare and it has been identified in only 4.2% of surgical colics. Faecaliths are frequently found in American Miniature Horse (AMHs) and pony foals. While the reason for the breed predisposition is unknown, it has been speculated that the inability to masticate or digest forage adequately contributes to the high incidence in foals. This theory is supported by the report of recurrent small colon obstructions in a 7-week-old colt with a mandibular fracture. The Arabian breed may also be overrepresented compared with the hospital population. Mares may also be at increased risk for small colon lesions, possibly because of hormonal fluctuations affecting gastrointestinal motility.

Conditions affecting the small colon can be divided into congenital diseases, simple obstructions, vascular lesions, and strangulating lesions. Small colon impaction is the most common abnormal condition of the small colon in adult horses, affecting 1.9% to 2.5% of all horses seen for colic. Several studies report a strong association between small colon impaction and diarrhea. The most recent study documents that horses with diarrhea are 10 times more likely to develop a small colon impaction than horses without diarrhea. Clinical signs include abdominal pain and distention, lethargy, inappetence, decreased or no faecal output and straining to defaecate. Only a few cases respond to medical treatment and abdominal exploration is often necessary. The most common surgical technique to resolve diffuse faecal impactions is the careful administration of warm water enemas, while the surgeon breaks the impaction down with gentle transluminal massage. Faecaliths are removed via a small colon enterotomy, unless they are located too far orally in the small colon to be exteriorised. In these cases, they are carefully retropropulsed into the right dorsal colon and removed through a large colon enterotomy.

List of Abbreviations

AAS: Acute Abdominal Syndrome
AMH: American Miniature Horse

References

Aortic Aneurysm and Neuritis of Cauda Equina in an Arabian Stallion

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Abstract

Case Description- A 6-year-old Arabian stallion was referred for evaluation of restlessness, oliguria, inappetance and moderate degrees of paddling and pawing (per every 2 hours with 30 min duration).

Clinical Findings- During clinical evaluations fecal incontinence, atomic distended bladder and a large distended pulsated tube were noticed. Doppler ultrasonography was performed via rectal approach and a dilation at the terminal portion of the aorta (Average diameter = 5.96 cm) with turbulent flow and aliasing artifacts which may relate to ventral aortic thrombosis were diagnosed.

Treatment and Outcome- Initial cause(s) of aortic aneurysm in our present case was obscured but feeding the stallion with clover, frequent sexual activities and the lack of organized anthelmintic program may predispose him to the occurrence of aneurysm. Due to these findings urinary catheterization was performed and 7.2 liters urine was collected and feces were removed from the rectum. Liquid paraffin (8 ml/Kg PO), phenylbuthazone (2.2 mg/Kg IV), Ivermectin (0.02 mg/Kg PO) and calcium compound (1gr/45Kg B.W. IV) were used and the patient was monitored. One hour later all signs of discomfort were relieved and the horse had an active normal urination.

Clinical Relevance- The present report was decided to explain the clinical signs of aortic aneurysm and partial type of neuritis of cauda equina in a stallion for the first time. Abdominal aortic aneurysm is a condition that may be lethal when it is unrecognized. Aneurysms are generally defined by a 50% increase in native vessel diameter and the abdominal aorta between the renal arteries and the iliac bifurcation is the most common extracranial site of aneurysm formation. Aneurysms, which are vascular dilations, develop from weakening of the medial elastic coat of blood vessels. The medial weakness may be primary or caused by a progression of an intima atherosclerotic lesion that has enlarged from hemorrhage, calcification, ulceration, and thrombus formation. The specific causes of aneurysms in large animals are unknown, but trauma (internal or external), sepsis, parasite migration, degenerative vascular disease, atherosclerosis, or aging changes (dilation, elongation, and loss of elasticity of blood vessels) may play a role.

Key Words- Aneurysm, Cauda equina, stallion, aorta.

Case Description

A 6-year-old Arabian stallion was referred for evaluation of restlessness, inappetance, oliguria and moderate degrees of paddling and pawing (per every 2 hours with 30 min duration). The horse was kept indoors and used a mixed diet of clover, oats and straw respectively. In rectal examination the bladder was distended with urine and palpation of the abdominal aorta showed that it was considerably dilated.

During one hour about 7 liters of urine was removed from the bladder by catheter. Because of the probability of bladder paralysis and dilatation of the aorta, examination continued by Doppler ultrasonography and according to the ultrasound observations the aneurysm of abdominal aorta was confirmed.

Clinical Findings

Clinical signs included respiratory distress, increased heart rate, fecal incontinence, atomic distended bladder and a large distended pulsated tube. Also right leg was cool to the touch at rest. Doppler ultrasonography was performed via rectal approach and a dilation at the terminal portion of the aorta (Average diameter = 5.96 cm) with turbulent flow at high speed and aliasing artifacts which may relate to ventral aortic thrombosis were diagnosed. There were mixed of light blue, light red and yellow colors in Doppler ultrasonography that take place because of turbulent flow at high speed and there was a sign of aliasing artifacts. These mixed colors could be sign of blood clot (Fig.1).
Treatment and Outcome

Initial cause(s) of aortic aneurysm in our present case was obscured but feeding the stallion with clover, frequent sexual activities and the lack of organized anthelmintic program may predispose him to the occurrence of aneurysm. Due to these findings urinary catheterization was performed and 7.2 liters urine was collected and feces were removed from the rectum. Liquid paraffin (8 ml/Kg PO), phenylbutazone (2.2 mg/Kg IV), Ivermectin (0.02 mg/Kg PO) and calcium compound (1gr/45Kg B.W. IV) were used and the patient was monitored. One hour later all signs of discomfort were relieved and the horse had an active normal urination.

Clinical Relevance

Aneurysms or pseudoaneurysms may be visualized radiographically as soft-tissue density masses continuous with a vessel wall (true aneurysm) or extending outward from a vessel wall (false aneurysm).1,4,6 Aortoiliac thrombosis in horses also is characterized by heavy sweating after exercise, except over the hindlimbs, which are cool. With severe aortoiliac thrombosis the affected limb can be cool to the touch at rest or can be cold with no palpable femoral arterial pulse.1 Asymmetric iliac pulses may be palpated. Fremitus of the iliac arteries or terminal part of the aorta may be palpated. The terminal part of the aorta may feel larger or firmer than normal, or an aneurysmal dilation may be detected. Either aneurysm or thrombosis can occlude blood flow to vital structures or organs, resulting in ischemia.2,5 Unruptured aneurysms may have other complications such as thrombosis or embolization of the thrombus. If the thrombosis involves the terminal aorta and iliac arteries in horses, the signs are frequently a vague hindlimb lameness, exercise intolerance, or poor performance. Failure to ejaculate has been reported in breeding stallions with aortoiliac thrombosis. Aortic-iliac thrombosis is an acquired disease of unknown pathogenesis primarily affecting the terminal portion of the aorta, and the internal and external iliac arteries.3,5 Aortoiliac thrombosis is also a recognized syndrome diagnosed most frequently in heavily exercised horses. Although parasitism has been associated with aortoiliac thrombosis in horses, other causes of this syndrome are probable but have not been elucidated. Thrombotic disease can occur in any animal having repeated intravenous injections or being catheterized for administration of medication or fluids but is particularly common in horses with acute toxic enteritis or colitis. Aneurysms are uncommon in large animals but have been documented as the cause of sudden death in breeding stallions and racing thoroughbred and standardbred horses.

On the other hand, the cauda equina is supplied by blood from the sacral arteries, which arise from the hypogastric artery. Symptoms can vary depending on the size and location of the lesion. Hence upper cauda equina may cause root or segmental effects with late bladder involvement, whilst a lower cauda equina lesion causes root damage, with early bladder incontinence and saddle anaesthesia (S2-S5). Urinary incontinence occurs in many horses because of involvement of parasympathetic fibers in the sacral nerves and is the lower motoneuron type (i.e., bladder is atonic, distended, and easily expressed manually). When the nerve roots of the lumbosacral enlargement of the spinal cord are involved, hindlimb weakness with ataxia is seen. Any disorder that affects the cauda equina may cause similar signs. These include instabilities of the caudal spine caused by luxations or fractures, EHV myelitis, sorghum intoxication, and infectious diseases that involve the cauda equine, as well as some primary diseases of the lower urinary tract.5

Figure 1. Aortic dilation and stenosis with doppler (Left); Aliasing artifacts which may relate to ventral aortic thrombosis (Right)
The present report was decided to explain the clinical signs of aortic aneurysm and partial type of neuritis of cauda equina in a stallion for the first time. It seems to excessive use of clover in the diet increases the probability of bladder paralysis and aneurysm of aorta. On the other hand this stallion had some mating in brief interval which can lead to abdominal aortic aneurysm. Based on this information our treatment done for corection of aneurysm.

References

Surgical Resection and Diagnostic Report of a Well Differentiated Squamous Carcinoma in the Third Eyelid of a Horsecell

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Abstract

Case Description: A 23-year-old, white, mare, Arab horse presented with a third eyelid mass in its right eye for two month.
Clinical Finding: The mass was reddish cauliflower-like, ulcerated and approximately 4-5 cm in diameter. There were marked lacrimation and bloody discharge. The cornea was opaque. The menace and the palpebral responses were not present. The CBC and biochemical profile of the patient were in normal ranges.
Treatment and Outcome: We opted for the exenteration of the eyeball under general anesthesia using Diazepam and ketamie combination. Alternatively, Ketamin was used to maintain anesthesia. After establishing a sterile field, the exenteration was performed. The eye, orbital tissues, eyelids, and nictitating membrane were surgically removed. The mass was placed in buffered 10% formalin, processed for light microscopy and sections were stained with H&E.
Clinical Relevance: A Well differentiated SCC was diagnosed due to histopathological analysis as islands and nests of pleomorphic epithelial cells and keratin pearls were revealed. Postoperative follow-up was done after 6 months and there was no sign of recurrence or metastasizing. SCC is a locally aggressive tumor originating from squamous epithelium throughout the body including the eye and adnexa. SCC in the third eyelid of horses is rarely reported in literature. Surgical excision is the main therapy for SCC involving the nictitating membrane. If there is evidence of orbital invasion by the neoplasia, orbital exenteration is the treatment of choice. This report described a well differentiated Squamous cell carcinoma in the third eyelid of a horse.
Key Words: squamous cell carcinoma, third eyelid, horse.

Case Description

A 23-year-old, white, mare, Arab horse was referred for the evaluation of an enlarging mass on its right eye, which was perceived by its owner two month before the presentation.

Clinical Findings

Ophthalmic examination revealed a 5 cm diameter, red, ulcerated protruding from the free edge of the third eyelid of the left eye (Fig 1). The cornea was opaque. The menace and the palpebral responses were not present. The right eye was blind and had severe hemorrhagic ocular secretion. Moreover, severe hyperemia of the palpebral and bulbar surface of the nictitating membrane was noted. The left eye was normal. the complete blood count and serum chemistry profile were within normal ranges.

Figure 1. Appearance of the squamous cell carcinoma of the third eyelid in an initial examination.
Treatment and Outcome

The horse was routinely prepared for surgery; it was pre-medicated with intravenous 0.25 mg/kg acepromazine and xylazine (1mg/kg), anesthesia induced with combination of diazepam (0.05 mg/kg) and ketamin (2mg/kg), through intravenous route and maintained with ketamin. Intravenous fluids were administered throughout the surgical procedure. Retrobulbar nerve blocks also were used to abolish the unwanted movement. After establishing a sterile field, four-point nerve block were applied. A slightly curved 20-gauge, 7.62 cm (3-inch) spinal needle was used to place 5 to 10 mL of local anesthetic in each quadrant of the orbit. First, eyelids was closed with a simple continuous suture pattern of 1-0 nylon. The eye, orbital tissues, eyelids, and nictitating membrane were surgically removed. Skin was closed with single interrupted sutures with 2-0 nylon. The third eyelid was placed in buffered 10% formalin, processed for light microscopy, and sections were stained with hematoxylin eosin. The histopathological evaluation was performed by the Sector of Veterinary Pathology (SVP), Department of Veterinary Clinical Pathology of Shahid Chamran University. A well differentiated Squamous cell carcinoma (SCC) was diagnosed based on the results of histological examination of formalin-fixed tissue specimen, which revealed islands and nests of pleomorphic epithelial cells and keratin pearls. The mass was composed of irregular vascular channels containing blood and lined by fusiform to plump oval cells with scant to moderate pale eosinophilic cytoplasm, indistinct cell margins and moderate anisocytosis.

Clinical Relevance

SCC is the most common tumor of the eye and adnexa in horses, and the second most common tumor of horses; however, SCC in the third eyelid of horses is rarely reported in literature. Histologically, squamous epithelial tumors can be sub-divided into four types: squamous papilloma, squamous plaque, squamous cell carcinoma in situ, and squamous cell carcinoma. Squamous cell carcinoma is malignant transformation of squamous epithelial cells. The nuclei of these cells can be either vesicular or hyperchromatic with increased mitotic figures and pleomorphism. There are various grades of squamous cell carcinoma ranging from low grade to highly malignant lesions. Squamous cell carcinomas can be graded as well, moderately, and poorly differentiated based on characteristics such as cellular arrangement, intercellular bridging, invasiveness, and keratinization. An increased prevalence for squamous cell carcinoma is reported in heavy draft breeds, Appaloosas, Paint horses, Thoroughbreds, and Quarter Horses. Sex predilection for the development of squamous cell carcinoma is reported for geldings. Increased exposure to UV light is thought to be a risk factor for the development of squamous cell carcinoma in light colored horses and those with non-pigmented skin surfaces, and in horses with exposure to a higher intensity and duration of solar radiation regardless of coat color. This suggests an actinic solar response in the pathogenesis of the tumor. SCC is more often unilateral in horses, but it can be bilateral in approximately 16% of the cases. This neoplasm can arise in any ocular tissue, but lower eyelid, lateral canthus, and the third eyelid are the most common sites of the development of the tumor in horses. In the present case, the tumor was unilateral and involved only the nictitating membrane of the right eye. The owner of the horse was advised to frequently nictitate the membrane of the right eye. Once the horses affected by SCC can develop the same lesion in the contralateral eye in the coming years. The occurrence of ocular SCC in horses increases with their advanced age. The horse reported in our study fit in several mentioned predisposing factors constant exposure to sunlight, the animal had advanced age.

The appearance of the SCC may vary depending on the location of the tumor. When they affect the cornea or limbus, SCC usually presents a high mass level and papillary and clear pink Appearance, and the third eyelid may develop a wavy or thickened look as well. In the eyelid, the SCC has usually been shown as a smooth mass and may become ulcerated. In our case, ophthalmologic examination revealed a red mass, ulcerated and protruding at the free edge of the third eyelid of the left eye. Definitive ocular SCC diagnosis requires histopathological examination. In the present case, SCC was diagnosed based on the results of histological examination of the formalin fixed third eyelid, which revealed keratin pearls. This case was similar to previously reported SCC cases in horses in terms of their histopathological characteristics.

Non-radiation and radiation therapies are reported for the treatment of SCC. Non-radiation treatments included surgical excision, cryotherapy, radiofrequency hyperthermia, immunotherapy, chemotherapy (cisplatin), and Co2 laser ablation. Radiation therapies include strontium-90, cobalt-60, gold-198, iridium-192, cesium-137, iodine-125, and radon-222. SCC is an aggressive tumor that is associated with a high rate of local recurrence, but with a low rate of metastasis. The recurrence is significant in cases where surgical excision is performed adjacent untreated or when you can not remove the tumor with margins of safety conditions, and complementary therapies are not going to eliminate residual tumor cells. In the case described, the horse was blind in its right eye, therefore, we opted to eye removal in conjunction with the third eyelid and orbital tissues adjacent not using any adjuvant treatment.
In the case presented, the treatment of the neoplasm was apparently successful because the horse is still alive (ten months after surgery) with no evidence of metastasis and recurrence. This investigation may contribute to early diagnosis and improved treatment of SCC, as well as the patient’s increased mean survival time and an improved quality of life for patients with ocular SCC.

References-

**Subjective Assessment of Analgesic Efficacy of Intra-articular Tramadol Administration Following Arthroscopic Surgery in Horses; a Pilot Study**

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**Abstract**

**Objective** – To evaluate the analgesic efficacy of intra-articular administration of tramadol in horses following arthroscopic surgery.

**Design**- Experimental study.

**Animals**- Ten adult warmblood horses.

**Procedures**- Ten horses underwent arthroscopic surgery of hock (8 joints) and fetlock joints (2 joints). Intra-articular tramadol (2 mg/kg) or saline was administered in randomly selected horses (5 in each group; 4 hock and 1 fetlock) under general anesthesia before recovery. Two observers blinded to treatment scored pain independently at 1, 2, 3, 4, 6, 8, 12 and 24 hours after complete recovery following transmission of horses from recovery room to their own boxes and based on a composite measure pain scale (CMPS).

**Results**- Significant difference (P<0.001) was observed between treatments, except at 24 hours post-injection. No significant differences was seen between various times in saline treated group (P=0.09), meanwhile it was considerable in tramadol treated group (P < 0.001), CMPS of the 12 and 24 hours showed significant higher scores in comparison with other times in this group.

**Conclusion and Clinical Relevance**- Analgesic efficacy of intra-articular tramadol administration was demonstrated by significantly reduced pain scores following arthroscopic surgery in horses. So, it can be used as a part of multimodal analgesic protocol, however, more detailed studies are warranted.

**Key Words**- Tramadol, intra-articular administration, arthroscopic surgery, horses.

**Introduction**

Nowadays, diagnostic and therapeutic arthroscopic surgery is a common procedure in horses and arthritis is a common disease in this species. During arthroscopic surgery, frequently more joint manipulation needs to be performed than just fragment removal and, in situations where synovium and joint capsule will be cut and subchondral bone will be debrided, adequate pain management is necessary and important to decrease tissue morbidity and improve the welfare of the horse. Balanced or multimodal analgesia, which offers several advantages in the management of postoperative pain, results from the administration of analgesic drugs in combination and at multiple sites to induce analgesia by altering more than one part of the nociceptive process. When multimodal analgesia is used, does of individual drugs can be reduced, thereby decreasing the potential for any one drug to induce adverse side effects. Opioids are not widely used in horses because of their side effects and also the regulatory controls on opioids make their practical use difficult. The analgesic and other effects of intravenous tramadol in horses are unknown. If it does not cause the typical opioid-induced sympathetic stimulation, increased locomotion, and CNS excitation, it has the potential to be a useful analgesic in horses. Recently, opioid receptors were identified by immunohistochemical staining and radioligand-binding assay in synovial cells of patients with rheumatoid arthritis, and in equine joints. The aim of the present study is to investigate the analgesic efficacy of intraarticular administration of tramadol as a part of multimodal analgesia following arthroscopic surgery in horses.

**Materials and Methods**

Analgesic efficacy of the tramadol was assessed using composite measure pain scale (CMPS) in 10 horses underwent arthroscopic surgery of the hock and fetlock joints with OCD and bone fragmentation lesions, under general anesthesia. CMPS was used based on pain-associated behavior. Two observers scored pain independently at 1, 2, 3, 4, 6, 8, 12 and 24 hours after intra-articular administration of 2 mg/kg tramadol (Ratiopharm 50 mg/ml injektionslosung; Germany) or saline (equivalent volume to the same volume of 2 mg/kg tramadol) following arthroscopic surgery, which was performed by the one surgeon and under general anesthesia. Horses (5 in each group) received the treatment at the end of the surgery and skin suturing. Observers were unaware of the treatment used. Pain scoring started after complete recovery of the horses and transmission of the horses from recovery room to their own boxes. The CMPS was based on six behavioral categories which were evaluated and scored at each time point in two stages; without entering the stable and following entering the box stall (Table 1). Statistical analysis was performed using SPSS program for windows using Mann-Whitney, Kruska-Vallis and
Duncan tests. Data is reported as means ± SEM and differences were considered significant at P≤0.05. (SPSS Inc., Chicago, IL, USA).

**Table 1. Definitions of the composite measure pain scale for subjective pain evaluation.**

<table>
<thead>
<tr>
<th>Pain score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross pain behavior</strong></td>
<td>none</td>
<td>Occasional</td>
<td>continuously taking foot off the ground and trying to replace it</td>
<td>Carpus slightly flexed</td>
<td>Continuous</td>
</tr>
<tr>
<td><strong>Weight bearing</strong></td>
<td>Normal weight bearing or walking</td>
<td>Foot intermittent off the ground/resting more than other thoracic limb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Head position</strong></td>
<td>Above withers or eating</td>
<td>level of withers</td>
<td>below withers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Location in stall</strong></td>
<td>At door watching environment</td>
<td>Standing in the middle, facing door</td>
<td>Standing in the middle, facing sides</td>
<td>Standing in the middle, facing back or standing in the back</td>
<td></td>
</tr>
<tr>
<td><strong>Response to open door</strong></td>
<td>Moves to door</td>
<td>Looks at door</td>
<td>No response</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response to approach</strong></td>
<td>Moves to observer, ears forward</td>
<td>Looks at observer, ears forward</td>
<td>Moves away from observer</td>
<td>Does not move, ears back</td>
<td></td>
</tr>
<tr>
<td><strong>Overall subjective pain score</strong></td>
<td>No apparent pain</td>
<td>Mild discomfort</td>
<td>Slight pain</td>
<td>Moderate pain</td>
<td>Severe orthopedic pain</td>
</tr>
</tbody>
</table>

*Gross pain behavior is defined as tooth-grinding, lip curtail, pawing, and sweating.

**Results**

Significant difference (P<0.001) was observed between treatments (tramadol and saline) following arthroscopic surgery, except at 24 hours post-injection. Figure 1 shows the changes in CMPS scores over the time. Results of the CMPS scoring of the pain are presented in Table 2.

**Table 2. Results of the composite measure pain scale (CMPS) scores.**

<table>
<thead>
<tr>
<th>CMPS scores of the post-injection hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>12</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Overall</em> Tramadol</td>
<td>2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.3&lt;sup&gt;*a&lt;/sup&gt;</td>
<td>11.5&lt;sup&gt;*a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Saline</td>
<td>13.3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>14.8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>16.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>16.3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>17.7&lt;sup&gt;b&lt;/sup&gt;</td>
<td>18&lt;sup&gt;b&lt;/sup&gt;</td>
<td>16.7&lt;sup&gt;b&lt;/sup&gt;</td>
<td>13.9</td>
</tr>
</tbody>
</table>

<sup>*</sup>Significant difference with the first score (P<0.05).

<sup>a</sup> Significantly different from <sup>b</sup> in the same time between groups.
Discussion

Significantly lower pain score was observed in tramadol treated joints in comparison with saline treated as control, up to 12 hours post-operatively. Providing adequate analgesia to the animal represents one very important step in making the animal comfortable and improving outcome. Procedures such as osteochondral fragment removal and subchondral bone debridement of large areas caused by osteochondritis dissecans lesions or femorocondylar cysts (that will undergo debridement) would be examples where pain management would be necessary to be utilized following arthroscopic surgery.6

In this study, frequency and duration of box behavioral parameters such as weight bearing, head position, location in stall, response to open the door and response to approach inside the horses own boxes were assessed. It was used as composite measure pain scale by Lindegaard and his colleagues in order to evaluate the analgesic efficacy of intra-articular morphine in radiocarpal induced synovitis in eight horses.5 From a clinical point of view, CMPS has been less subjective, easier to use, reproducible, and consequently more reliable with good inter-observer agreement. So, it is suggested to be employed for evaluation of orthopedic pain in equine patients, the same method which is used in present study.

Dhanjal et al. showed that IV tramadol administration to the horses does not produce the classical effects that have been reported with other opioids.2 In the current study, no adverse effects were observed after intra-articular tramadol administration in horses, although nausea, confusion, agitation, tremor, and tachycardia are reported.7 Alagol et al. showed that tramadol provides analgesia with a peripheral mechanism when administered intra-articularly.8 Akinci et al. have reported that 50 mg of tramadol and 5 mg of morphine have comparable analgesic effects when used intra-articularly after arthroscopic knee surgery.9 Intra-articular 50 mg tramadol was not found to be very efficacious after meniscectomy in a study,10 the researchers suggested that it might be resulted from inadequate dosage. In this study, 2 mg/kg tramadol was used, it equals the systemic dose of tramadol reported to induce analgesia, and also the suggested dose for parenteral administration in horses.11

In our study, significant difference was observed between CMPS scores of the intra-articular saline solution and tramadol treated horses after arthroscopic surgery. In tramadol treated horses, the mean CMPS scores were between 2 and 4 till 4 hours, and afterward it started to increase till the end of evaluation time; 24 hours. Scores were less than 10 before 12 hours and about 12 at 24 hours. On the other hand, in saline treated joint, mean CMPS score increased till 8 hours and thereafter showed a decrease till 24 hour; overall, it was not less than 12. In tramadol group, CMPS scores of the 12 and 24 hours were significantly different (higher) than other times. It can be related to the duration of the analgesic efficacy of the tramadol, which is being reduced through the postoperative period. Epidural administration of tramadol 2 mg/kg has been effective in management of perineal and lumbosacral pain in horse without special side effect, it has been detectable in plasma after 5 minutes up to 8 hours.12 In present study, the highest CMPS (less pain) has been established between 6-8 hours postoperatively.
In conclusion, possible effects of tramadol as anti-inflammatory, analgesic and local anesthetic besides its limited side effects in comparison with other opioids present this drug as a suitable choice for intraarticular administration after arthroscopic surgery. Therefore, it can be used as a part of multimodal analgesic protocol; however, more detailed studies and in more clinical cases are warranted.

References

What is your Diagnosis? Severe Cervical Scoliosis in a Darreh-Shuri filly

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Abstract

Case Description- A 13-month-old young female horse with a severe cervical scoliosis.

Clinical Findings- Although the filly had a history of being fallen in a pit three months ago, acute onset of the scoliosis had been started 1.5 month later. Thereafter, slight neck swelling had gradually turned into 60° rotation of the head and neck. The animal was not imbalanced while waking and eating, but was not able to bring her forelimbs under the body while lying down. Clinical examinations revealed normal vital signs and no special concurrent abnormality was noticed. Complete blood count measures were within normal limit, too. C-shaped severe cervical curvature and scoliosis toward right side of the body was remarkable that could be manually straightened temporarily without pain of the neck on the convex side. Cervical dorsoventral and lateral radiographs depicted chronic C4-C5 fusion and severe scoliosis between C4-C6. A tentative diagnosis of cervical vertebrae fracture or Parelaphostrongylus tenuis migration through the dorsal gray column of the affected side was made.

Treatment and Outcome- Ivermectin, vitamin E and IM injections of isoflupredone acetate 15 mg were administered. Finally, the euthanasia was considered because of no improvement after two months.

Clinical Relevance- No horses have been reported to recover normal functions following infestation by Parelaphostrongylus tenuis because of the severe necrosis of the affected segments of spinal dorsal gray column or chronic severe irreversible injuries of the cervical vertebrae.

Key Words- Cervical scoliosis, filly.

Case Description

A 13-month-old Darreh-Shuri filly was referred because of acute onset of cervical scoliosis from 1.5 month ago. The filly had a history of being fallen in a pit three months ago, too. Thereafter, slight neck swelling had been gradually turned into 60° rotation of the head and neck.

Clinical Findings

The animal was not imbalanced while waking and eating, but was not able to bring her forelimbs under the body while lying down. Clinical examinations revealed normal vital signs and no special concurrent abnormality was noticed. Complete blood count measures were within normal limit, too. Physical examination revealed severe scoliosis of the caudal portion of the cervical vertebral column with a C-shaped curvature to the right side (Fig.1). No gait deficits were observed. The condition was not painful and the neck could be manually and temporarily straightened slightly without pain of the neck on the convex side. Following general anesthesia, cervical dorsoventral and lateral radiographs depicted chronic C4-C5 fusion and severe scoliosis between C4-C6 (Fig.2).
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Equine Lameness and Surgery (Extended Abstract)

Figure 1. Severe cervical scoliosis with a C-shaped curvature to the right side.

Figure 2. Lateral radiographs depicting chronic C4-C5 fusion and severe scoliosis between C4-C6.

Treatment and Outcome

A tentative diagnosis of cervical vertebrae fracture or *Parelaphostrongylus tenuis* migration through the dorsal gray column of the affected side was made. Ivermectin, vitamin E and IM injections of isoflupredone acetate 15 mg were administered. Finally, the euthanasia was considered because of no improvement after two months.

Clinical Relevance

*Parelaphostrongylus tenuis* is found in horses with a syndrome of acquired dorsal gray matter myelitis and acute-onset cervical scoliosis. This suggests that *P. tenuis* is capable of penetrating the equine central nervous system (CNS), and that parasite migration may cause cervical scoliosis in some cases. It is a natural nematode parasite of the deer. In the normal life cycle, adult worms reside and lay eggs in the meninges of the deer. The eggs pass into venous circulation and travel to the lungs, where they hatch into first stage (L1) larvae. The L1 stage is coughed up, swallowed, and passed in the feces. Once shed into the environment, larvae invade or are ingested by terrestrial gastropods and develop to the third (L3) larval stage over 3 to 4 weeks. Infected gastropods are ingested, and the L3 stage migrates to the dorsal horn gray matter of the spinal cord, where they mature. From here, the life cycle is completed by parasitic...
migration to the subdural space and then to the brain through the dura mater and cranial venous sinuses. The prepatent period in the white-tailed deer is 82 to 92 days. In aberrant hosts, third-stage larvae migrate aimlessly within the CNS, leading to clinical disease.1 Classic signs of acute onset of cervical scoliosis that can be manually straightened temporarily without pain, analgesia of the neck on the convex side, and mild or no ataxia is reported to be the most remarkable manifestations of the condition,1 the signs that could be seen in the present case. The parasite appears to have a migratory predilection in the horse for the dorsal gray column of the cervical and sometimes thoracic cord. If the lesion extends three or more vertebral segments, acute onset scoliosis with the head deviated away from the lesion side will occur; suspected symptoms of the present case. Considerable hypalgesia exists over the scoliosis on the convex side. There may be mild ipsilateral ataxia on the side with the convexity of the neck. Cerebrospinal fluid (CSF) is usually normal but in some cases has high total protein concentration and extremely high nucleated cell count with a high proportion of eosinophils, suggesting parasitic infection.2 Although radiography and computed tomography (CT) provides an accurate description of the vertebral problems,4 antemortem diagnosis of *P. tenuis* has not been definitive, and is typically based on the combination of classic neurologic examination findings, exposure to white-tailed deer, the presence of eosinophils in the CSF, and response to treatment with anthelminitics (ivermectin and fenbendazole), anti-inflammatories (flunixin meglumine and corticosteroids), and other supportive neuroprotectants (vitamin E, thiamine). The clinical sign of acute onset scoliosis is nearly diagnostic for the equine disease. Affected horses have been reported to be 6 months to 3 years of age. Initially, there is no pain in manipulation of the neck, but after several weeks, arthritic changes develop. Although being fallen in a pit in the history of the filly seemed suspicious, no clinical sign thereafter until acute onset of cervical scoliosis about 1.5 months later rejects vertebral trauma. In these cases, Ivermectin, fenbendazole and corticosteroids are usually administered, but because of the severe necrosis of the affected segments of dorsal gray column, no horses have been reported to recover normal function,2 So, the prognosis is poor.3 The fillie's condition in this report continued to deteriorate with no improvement because of the advanced vertebral lesions and was euthanized after approximately two months. Early analysis of the CSF, CT scanning of the vertebral column and detection of any exposure to the deer is recommended in the similar cases.

**List of Abbreviations**

CNS: Central nervous system  
CSF: Cerebrospinal fluid  
CT: Computed tomography

**References**

Diagnosis and Surgical Removal of a Granulosa-theca Cell Tumor By Use of the Flank Approach in a Standing Mare

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Abstract

Case Description- A 5-year-old Arabian mare with 400 kg body weight was presented with 3-month history of gradual changes in behavior, characterized as stallion-like, including aggressiveness towards people and other horses in late estrus.

Clinical Findings-No abnormalities were noted on physical examination. However, on palpation per rectum, the left ovary was identified as a smooth, slightly lobulated mass, > 10cm in diameter, located ventrally to the left of the midline. The right ovary was small and inactive. Transrectal ultrasonographic examination revealed a mass composed of multiple, irregularly shaped cystic areas with a honey-comb appearance. The left ovary was confirmed to be small and inactive.Based on the history of aggressivemale-like behavior, the findings made by transrectal palpation and ultrasonography and testosterone levels 2/6 mmol/L, a diagnosis of granulosa theca cell tumor (GTCT) was made. Surgical removal of the affected ovary was chosen as the treatment of choice.

Treatment and Outcome- The mare was prepared for surgery by placement of a 14-gauge IV catheter in the left jugular vein. First, acepromazine with 0.05 mg/kg dosage was administrated to tranquilize the mare. After 20 minutes, neuroleptanalgesia was induced by administering xylazine (1 mg/kg BW), and morphine (0.3 mg/kg BW) intravenously. The area of the left paralumbar fossa was anesthetized with an inverted L block, using 60 mL 1% lidocaine hydrochloride with the horse standing. A 20-cm longitudinal skin incision was made in the left paralumbar fossa and ovarian tumor was removed after three transfixation ligatures of ovarian pedicle. Dimension of this ovarian tumor was 9.5 × 11.5 × 13 cm. The mare was treated with penicillin-streptomycin (15000 IU/kg BW), IM, q24h for 7 days and ketoprofen (2 mg/kg BW), IM, q24h for 3 days postoperatively.

Clinical Relevance- Ovarian tumors have been reported to have a frequency as high as 5.6% of all neoplasms in horses. Granulosa theca cell tumors are the most common and result in increased concentrations of plasma hormones such as testosterone, estrogen, progesterone, and inhibin.

Key Words- Ovariectomy, Granulosa cell tumor, Standing mare, Flank approach.
analgesia for Standing flank ovariectomy in the horse. The area of the left paralumbar fossa was anesthetized with an inverted L block, using 60 mL 1% lidocaine hydrochloride with the horse standing. A 20-cm longitudinal skin incision was made in the center of the left para-lumbar fossa (flank) between the last rib and the point of the hip. The incision is carried through the skin, fascia, external oblique and internal oblique muscles down to the peritoneum (fig 1). Bleeding from small vessels is controlled before the peritoneum is opened. Three transfixation sutures with No. 2 polyglycolate-coated suture material were placed through the ovarian pedicle to facilitate hemostasis. The ovarian pedicle was transected distal to the ligatures and the ovary removed. The pedicle was carefully inspected for hemorrhage. The muscles and peritoneum were closed using a 3-layer closure with No. 2 polyglycolate coated suture material. Skin was closed with No. 2 nylon suture material. Dimension of this ovarian tumor was 9.5 × 11.5 × 13 cm (fig 2). Post-operative care was consists of giving penicillin-streptomycin (15000 IU/kg BW), IM, q24h for 7 days and ketoprofen (2 mg/kg BW), IM, q24h for 3 days. During this time, she was monitored closely for evidence of wound dehiscence, hematoma, internal hemorrhage, or peritonitis, while being kept cross-tied in a box-stall for 3 weeks to restrict exercise and decrease pressure on the incision site. Following this, she was given progressively more exercise, beginning with hand-walking 5 min/d. The aggressive behavior was noted to subside gradually. By day 45, the mare could be turned out with other horses. Testosterone levels from blood collected at 3 week postsurgery were 1.2 mmol/L.

Clinical Relevance

the prevalence of ovarian tumors can be as high as 5.6% of all neoplasms in horses. The most common ovarian tumor in horses is the granulosa cell tumor, accounting for 2.5 to 4.4% of all tumors in horses. These tumors are benign in the sense that they do not metastasize (invade and spread to other parts of the body), but they can exert some severe physiological effects via hormones that they secrete. These tumors have been reported in mares of all ages, but have the highest frequency in mares between five and nine years of age. The abnormal cell growth occurs in cells that naturally produce sex hormones, i.e., testosterone, estrogen, etc., and therefore can cause excessive production of these hormones. A common finding in mares with a granulosa cell tumor which are exhibiting stallion-like behavior is a high level of the male sex hormone testosterone, as the plasma testosterone levels are elevated in approximately 50% of mares with this type of tumor. Reference intervals for mares and geldings are < 0.69 nmol/L. These cause a variety of reproductive and behavioral abnormalities, including anestrus, constant or erratic estrus, or stallion-like behaviors, making surgical removal of the affected ovary the treatment of choice. Ultrasonography can be extremely valuable in assessing an ovarian mass, granulosa cell tumors generally are multiloculated, fluid-filled structures. The treatment of choice for granulosa cell tumors is surgical removal. The surgical approach depends on the size of the abnormal ovary and preference of the surgeon. Grid or flank incisions in standing or recumbent mares and vaginal, ventral midline, ventral paramedian, and diagonal paramedian approaches have been recommended for ovariectomies in mares. Removal of tumors can alleviate behavioral problems and allow mares to resume reproductive or performance use. Using the flank approach, neoplastic ovaries may be difficult to exteriorize because of the thick and muscular wall in this area, the limited size of the paralumbar fossa, the thick layer of retroperitoneal fat in large mares, and the short ovarian pedicles of enlarged ovaries. For mares in which this technique is used, ovaries must be <15 cm in diameter to
enable them to be exteriorized. Commonly encountered complications include exsanguination, formation of seromas or hematomas, wound dehiscence, and scarring of the flank. This procedure is usually performed with the horse under general anesthesia, but occasionally is done with the horse standing while under heavy sedation and local anesthesia. One of the main benefits to the flank approach is an overall decreased convalescent period. The pedicle can be ligated by hand, using suture material or more commonly using surgical stapling instruments. However, if such a stapling instrument is not available, it is possible to achieve adequate hemostasis by careful dissection and ligation of the ovarian vessels, as was done in this case.

List of Abbreviations

GTCT: granulosa theca cell tumor.
CBC: complete blood cell count.

References

**Incidence of Rectal Tears in Colicky Horses Maltreated by Their Owners**

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**Abstract**

**Case Description** Rectal tears are serious injuries in the horse, most commonly occurring as a result of rectal examination by a veterinarian. Most rectal tears are located dorsally, 25-30 cm from the anus at the junction of the rectum and the small colon. Rectal tears may occur in horses of all ages although nervous or young horses are more often affected. Rectal tears are classified in a four-grade system according to the layers of the bowel wall involved. If a rectal tear is suspected, it is important to establish its extent as this dictates the treatment required and the prognosis for recovery. The horse should be sedated before further examination and an epidural should be performed in order to prevent straining. Careful rectal examination and endoscopy should be performed to locate and assess the tear in order to select appropriate management and treatment. Grade 1 and 2 tears are best managed conservatively with a combination of NSAID drugs, broad-spectrum antibiotics and laxatives such as mineral oil. A moist diet such as grass should be provided in order to aid defecation. The horse should be closely monitored for signs of colic, haematochezia, dyschezia, pyrexia and tenesmus. Repeated rectal examination should be avoided unless unavoidable. Grade 3 and 4 tears are acute, life-threatening emergencies and should be referred to a surgical facility. At the referral facility, abdominocentesis is performed to check for peritonitis. A number of surgical techniques have been described for the repair of Grade 3 and Grade 4 tears. These include suturing the tear closed via a rectal or ventral midline approach, or the use of a fecal diversion technique such as temporary colostomy to eliminate the passage of faeces through the rectum. The prognosis for rectal tears depends on the size, location and grade of the tear and the length of time between occurrence and treatment. Grade 1 and Grade 2 tears generally have a good prognosis and usually heal without complication. Grade 3 and Grade 4 tears are associated with a poor prognosis. If peritonitis is present the prognosis is grave and euthanasia is usually required.

**Key Words** Rectal tears, Horse, Peritonitis

**Clinical Relevance** Rectal tears are serious injuries in the horse, most commonly occurring as a result of rectal examination by a veterinarian. Most rectal tears are located dorsally, 25-30 cm from the anus at the junction of the rectum and the small colon. Rectal tears may occur in horses of all ages although nervous or young horses are more often affected. Rectal tears are classified in a four-grade system according to the layers of the bowel wall involved. If a rectal tear is suspected, it is important to establish its extent as this dictates the treatment required and the prognosis for recovery. The horse should be sedated before further examination and an epidural should be performed in order to prevent straining. Careful rectal examination and endoscopy should be performed to locate and assess the tear in order to select appropriate management and treatment. Grade 1 and 2 tears are best managed conservatively with a combination of NSAID drugs, broad-spectrum antibiotics and laxatives such as mineral oil. A moist diet such as grass should be provided in order to aid defecation. The horse should be closely monitored for signs of colic, haematochezia, dyschezia, pyrexia and tenesmus. Repeated rectal examination should be avoided unless unavoidable. Grade 3 and 4 tears are acute, life-threatening emergencies and should be referred to a surgical facility. At the referral facility, abdominocentesis is performed to check for peritonitis. A number of surgical techniques have been described for the repair of Grade 3 and Grade 4 tears. These include suturing the tear closed via a rectal or ventral midline approach, or the use of a fecal diversion technique such as temporary colostomy to eliminate the passage of faeces through the rectum. The prognosis for rectal tears depends on the size, location and grade of the tear and the length of time between occurrence and treatment. Grade 1 and Grade 2 tears generally have a good prognosis and usually heal without complication. Grade 3 and Grade 4 tears are associated with a poor prognosis. If peritonitis is present the prognosis is grave and euthanasia is usually required.

**Case Description**

Several rectal tears in horses were referred to the school of Veterinary Medicine, Shiraz University during these years. These poor horses were suffer from mild, moderate or even sever colic and instead of referring to veterinary centers, they rectaled by their owners in other to empty the rectum or maltreated doing enema with improper tools such as water hose or tankard. Other clinical signs were strain to defecate and signs of colic.

**Clinical Findings**

Elevated heart and respiratory rates, sweating, colic, increased capillary refill time and discolored mucus membranes, which indicated septic peritonitis. Hematological and serum biochemical changes in these horses are include leukopenia and neutropenia, increased band cell count, elevated hematocrit and total protein concentration initially, after which serum total protein concentration can decline as protein leaks into the abdomen. Without any history, these rectal tears were difficult to diagnosis, the presence of fresh blood on the feces and rectal sleeve following rectal examination were the first signs.

**Treatment and Outcome**

Otherwise of aggressive fluid and antibiotic therapy, unfortunately death occurred in all of these cases because of septic shock. Necropsy findings revealed that one of these cases was grade 3 and the others were grade 4 rectal tears, all of them had diffuse peritonitis.

**Key Words** Rectal tears, Horse, Peritonitis
the packing is to fill, but not distend, the rectum. The pack should extend from the anus to approximately 10 cm cranial to the site of the tear. The anus is then closed with towel clamps or a purse string suture to prevent the packing from exiting. Vigorous medical management should be instituted. Atropine, a parasympatholytic drug, has been recommended by some clinicians to depress intestinal motility. When used correctly as a single dose (0.044 mg/kg IM or subcutaneously [20 mg for a 450-kg horse]), atropine will decrease intestinal motility for up to 12 hours. This can be a safe and excellent way to depress intestinal motility. Broad-spectrum systemic antimicrobials, tetanus toxoid, and fecal laxatives such as mineral oil should also be administered. Balanced polyionic fluids should be administered to rehydrate the horse in anticipation of an extensive surgical procedure and to counter the hemodynamic effects of endotoxins. Several surgical techniques have been described to repair rectal tears. These include direct surgical repair via a rectal approach, partial prolapse of the rectum, placement of a temporary diverting colostomy, placement of a temporary rectal liner and direct surgical approach and repair via a celiotomy. The technique chosen to repair the rectal injury depends largely on the location of the tear, the preference and expertise of the surgeon, and the availability of specialized surgical equipment. Techniques used to repair Grade 3 tears also apply for Grade 4 tears. Because there is more direct contamination of the abdomen in Grade 4 tears, there is an increased expense due to the likelihood of multiple postoperative complications. As a result, a poorer prognosis is associated with Grade 4 tears so the value of the animal in perspective to the expense incurred should be taken into consideration. Early recognition of the condition, along with aggressive precautionary measures to arrest the further development of the tear is indicated. Surgical intervention should be instituted immediately, for delaying repair only increases the mortality rate associated with the disease.

Clinical Relevance

Most rectal tears occur in association with rectal palpation and should be suspected when a sudden decrease in the resistance to palpation is felt or when fresh blood is observed on the palpation sleeve. Rectal tears that occur caudal to the peritoneal reflection may lead to a retroperitoneal abscess that could extend into the abdominal cavity or require draining into the rectum, vagina, or perineum. Rectal tears have been classified on a four-grade system. Grade one tears are restricted to the mucosa and submucosa and palpate as a small roughening or defect in the rectal wall associated with bleeding. Grade two tears involve only the muscular layers of the rectal wall while the mucosa and serosa remain intact. No blood is seen on the rectal sleeve and these are considered to be incidental findings. Grade three lesions involve all tissue layers except the serosa or mesorectum. There are deep defects that are often filled with feces. Grade 3A tears have the serosal covering of the intact bowel, whereas Grade 3B tears occur dorsally into the fat filled mesorectum. Grade four tears involve a perforation of all layers of the rectal wall which permit direct communication between bowel contents and the abdominal cavity. Palpation of the abdominal organs directly is possible through a Grade 4 tear. With grade three or four tears the horse will begin to sweat, develop an increased heart rate, fever, abdominal pain and splinted abdomen in 2-3 hours consistent with signs characteristic of septicemia, endotoxic shock, and peritonitis. Most rectal tears occur dorsally, in a longitudinal direction 25 to 30 cm cranial to the anus in the intraperitoneal portion of the rectum and dissect obliquely for a variable distance along the lateral wall. In this region there is a decrease in the circular muscle thickness that corresponds with the increase in thickness of the mesenteric taenial band of the small colon. The decrease in circular muscle thickness along with a lack of serosal surface of the bowel enclosed in the mesorectum could contribute to the inherent weakness at this site.

References

Arthritis Due to Detached Fragment of the Sagittal Ridge of the Third Metacarpal Bone in a Foal: a Case Report

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Abstract

Case Description- A 45-days old foal with history of trauma and left forelimb lameness was referred to Veterinary Hospital of Shiraz University. Local swelling was evident on fetlock region of the affected limb.

Clinical Findings- Swelling, inflammation and pain was revealed on physical examination of the fetlock joint. Radiographic findings showed osteochondral fragmentation of distal edge of the sagittal ridge of the third metacarpal bone as a joint mouse in the joint space.

Treatment and Outcome- The animal was treated with conservative therapy including antibiotics and anti-inflammatory drugs and the limb was supported with external cooptation for two weeks. Radiographic re-evaluation of the lesion demonstrated a sequestrum in the joint space. The animal was prepared for aseptic surgery under general anesthesia. Arthrotomy of the fetlock joint was performed through the cranial latera approach and the fragments were curetted. The hypertrophied synovium was excised and the joint cavity was flushed with aggressive fluid followed by amikacin injection into the joint.

Clinical Relevance- Osteochondrosis of the sagittal ridge of third metacarpal bone is usually diagnosed in young horses and occurs with variable radiographic expression. This report demonstrated an osteochondral fragmentation of distal ridge of metacarpal bone with subsequent sequestrum formation and successful surgical removal of the lesion. Post-operative reevaluation revealed no specific complication with return of the limb to normal function.

Key Words- Osteochondral fragment, Sagittal ridge of the third metacarpal bone, Foal

Case Description

A 45-days old foal was referred to Veterinary Teaching Hospital of Shiraz University with history of trauma and left forelimb lameness. Local swelling was evident on fetlock region of the affected limb.

Clinical Findings

Physical examination revealed joint effusion, lameness and pain response to fetlock flexion. Radiographic evaluation showed osteochondral fragmentation of distal edge of the sagittal ridge of the third metacarpal bone as a joint mouse in the joint space and synovial distention(Fig.1).

Figure 1. Dorsopalmar radiograph of fetlock region. (A) normal limb. (B) affected MCP joint with osteochondrosis of the sagittal ridge of MC III. A radiolucent subchondral bone lysis (black arrows) is visible on distal edge of the sagittal ridge of the third metacarpal bone with adjacent osteochondral fragments.
Treatment and Outcome

Conservative therapy was considered in this case, and the foal was treated with antibiotics, anti-inflammatory drugs and external coaptation of the limb for two weeks. Radiographic recheck was performed two weeks later to evaluate the healing process. A sequestrum and a cyst-like lesion were obvious in distal edge of the sagittal ridge of the third metacarpal bone(Fig.2).

![Figure 2](image)

**Figure 2.**Dorsopalmar radiograph of fetlock after 2 weeks demonstrates a sequestrum and a cyst-like lesion on distal edge of the sagittal ridge of the third metacarpal bone.

![Figure 3](image)

**Figure 3.**Ultrasound of the affected fetlock joint (dorsal longitudinal scan). There is a hypoechoic defect in the cartilage and subchondral bone (whitearrow).

We suggested surgery to the owner and the foal was prepared for surgery. Food was withheld for 8 hours prior to surgery. Induction of anesthesia was carried out with diazepam and ketamin injection and the foal was placed in lateral recumbency, maintenance of anesthesia performed with inhalation of halothane. The joint was exposed by the craniolateral approach to the fetlock. Removal of the osteochondral fragment was easily accomplished with this approach because the usual location of the lesion is in the center of the surgical field. Sharp excision was done to free the partially attached flaps and the edges of the lesion were curetted subsequently. The joint was thoroughly searched for free fragments of cartilage before the closure. The hypertrophied inflammatory synovium was excised and the joint cavity was flushed with aggressive fluid followed by amikacin injection into the joint. A light bandage was applied for 2 weeks, with restricted activity advised for 4 weeks. The foal were walking normally within a few days after surgery.
Clinical Relevance

Osteochondrosis is one of the most important and prevalent developmental orthopedic diseases of horses. Although its specific etiology is not known, it is considered to arise from a focal disturbance in endochondral ossification. Osteochondral lesions and fragmentation of the distal sagittal ridge (sometimes extending to the adjacent condyle) of MC III and MT III have been classified as a form of osteochondrosis based on the histologic assessment in one horse and the clinical and surgical appearance of the lesions.

Synovial effusion is usually the first clinical sign observed. The degree of associated lameness varies, but flexion of the fetlock will usually provoke lameness. However, in many cases, joints may be radiographically affected without clinical symptoms. Clinical signs may be divided broadly into two categories; those seen in foals <6 mo old and those seen in older animals. Often the first sign noted in foals is a tendency to spend more time lying down. This is accompanied frequently by joint swelling, stiffness, and difficulty keeping up with other animals in the paddock. Fetlock osteochondrosis is particularly seen in younger foals (<6 mo old). Lameness is usually absent or mild. More severe signs are observed when osteochondral fragments come loose within the joint.

Management of osteochondrosis depends on the site and severity of signs. Mild cases recover spontaneously, and a conservative approach may be appropriate. In young animals (<12 mo old), this involves restricted exercise for some weeks combined with a reduction in feed intake to slow the growth rate. In those cases considered for surgery, damaged cartilage, osteochondral fragments, and compromised subchondral bone are removed and the joint flushed extensively with sterile fluid. Prognosis following removal of discrete osteochondral fragments is good. In cases with more extensive osteochondral damage, the prognosis depends on the extent of the joint surface that must be removed. The prognosis is poor for cases with instability resulting from joint surface loss or in which secondary osteo-arthritis (degenerative joint disease) is advanced.

This report demonstrated an osteochondral fragmentation of the distal ridge of the metacarpal bone with subsequent sequestrum formation and successful surgical removal of the lesion. Post-operative reevaluation revealed no specific complication with return of the limb to normal function.

List of Abbreviations

MCIII: Metacarpal III
MTIII: Metatarsal III
MCP: Metacarpophalangeal

References

17. Osteochondrosis in Horses (Osteochondritis dissecans, Dyschondroplasia). Available at:www.merckmanuals.com/vet/musculoskeletal_system/lameness_in_horses/osteochondrosis_in_horses.html
Concurrent Bilateral Traumatic Orchitis and Unilateral Inguinal Hernia in a Stallion

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Abstract

Case Description- A 7 year old stallion with a history of being kicked in the inguino-scrotal region and signs of moderate colic referred to Shiraz University Veterinary Teaching Hospital.

Clinical Findings- Large scrotal swelling was obvious during observation. The stallion had signs of moderate colic pain. Clinical examination revealed slightly decreased gastrointestinal motility. The stallion was about 8% dehydrated, had normal vital signs and CBC values. Ultrasonographic examination confirmed presence of intestine and blood clots in the hernial sac concurrent with bilateral severe orchitis.

Treatment and Outcome- Following fluid therapy, premedication with acepromazine and xylazine, anesthesia was induced using ketamine and diazepam combination and maintained with halothane in oxygen. After positioning in dorsal recumbency, routine surgical preparations and using inguinal approach, right testis was removed by a closed castration while right inguinal ring was intact. Open castration of the left testis was done as the tunica vaginalis was ruptured. Huge amount of blood clots, presumably originated from severely injured testicular vasculature, were removed from the hernia sac and following replacing its reducible contents (parts of small intestine), the ring was closed with interrupted pattern of heavy absorbable suture. After placing a Penrose drain, fascia and skin were closed routinely. The stallion was treated for 7 and 5 days with broad-spectrum antibiotic and NSAID, respectively.

Clinical Relevance- In adult horses, inguinal rupture is primarily traumatic in origin. Although an acute increase in testicular size is suggestive of inguinal herniation, it is also suggestive of torsion of the spermatic cord, orchitis or thrombosis of the testicular vasculature.

Key Words- Bilateral orchitis, scrotal herniation, stallion.

Case Description

A 7-year-old Darreh-shuri stallion presented to Shiraz University veterinary teaching hospital with a history of being knick in the inguino-scrotal region and sings of moderate colic. The trauma was induced three days before and during the mating. Scrotum was enlarged grossly after trauma and the stallion had become depressed and anorexic with moderate signs of colic afterwards. The stallion had no history of colic before the trauma.

Clinical Findings

General observation revealed bilaterally and grossly enlarged scrotum. Both testes were painful on palpation. Vital signs were as follow: temperature 37.4°C, heart rate 44 beats/min and respiratory rate 28 beats/min. The animal was dehydrated 8% with mild prolong capillary refill time (CRT) and mild congestive mucosa membrane. Auscultation of the abdomen showed decreased gastrointenstinal borborygmi. The complete blood count (CBC) revealed no abnormality except slightly increase in MCV and MCH and mild decrease in Lymphocytes, The horse had signs of moderate colic. Sonographic examination of the scrotum revealed hemorrhage, blood clots, intestinal loops and bilateral orchitis (Fig. 1).

Figure 1: Ultrasonographic image of the scrotal herniation (7.5 MHz linear-array transducer). Note the perence of intestine, haemorrhage, blood clots and orchitis in scrotal sac.
Treatment and Outcome

Following fluid therapy, pre-operative administration of cefazolin (25 mg/kg body weight, IV) and phenylbutazone (2 mg/kg, IV), intravenous premedication was done by acepromazine 0.05 mg/kg and xylazine 1.1 mg/kg IV. Anesthesia was induced using ketamine 2 mg/kg and diazepam 0.05 mg/kg BW combination. The horse was intubated and general anesthesia was maintained with halothane in oxygen. The horse was placed in dorsal recumbancy and the inguino-scrotal region was clipped and aseptically prepared for surgery. By using inguinal approach A 20-cm incision thorough subcutaneous tissue and skin was made and right testis was removed by closed technique castration. Right Inguinal ring was intact. For the left testis open castration was performed when the incision was done. Tunica vaginalis in the left side was ruptured and portions of small intestine was being subcutaneously. Huge amount of blood clots presumably oriented from severely injured testicular vasculature was in the region. Henia reducible contents (parts of small intestine) were replaced in abdomen and blood clots were removed. Both testes was grossly inflamed and bilateral orchitis was obvious. Suteficial inguinal ring was closed using 2 polydioxanone in a simple interrupted pattern suture. After placing a penrose drain in the surgical area fascia and skin were closed routinely. The horse was recovered excellent without any complication. After surgery, antimicrobial treatment was continued for 7 days and phenylbutazone was continued for 5 days. The owner was instructed to monitor the incision site for any swelling or discharge and bring back the horse for reevaluation and removing the drain. The horse was discharged from the clinic after surgery with instructions for 2 weeks of stall rest followed by 2 weeks of small paddock turn-out.

Clinical Relevance

An inguinal hernia occurs when intestines, typically ileum or jejunum, pass through the vaginal ring and inguinal canal. Inguinal herniation and rupture occur almost exclusively in Stallions, similar to the presented case with a history of kick trauma during the mating. In adult horses, inguinal rupture is primarily traumatic in origin. Trauma to the external genitalia is always a possibility under natural mating situations. Congenital hernias in the equine patient are most commonly reported at the umbilicus and caudal abdomen (typically inguinal), but are also reported in the diaphragm.

Inguinal rupture occurs when intestine protrudes through a rent in the peritoneum and transverse fascia adjacent to the vaginal ring, causing intestine to reside subcutaneously beside the vaginal process. In most of the cases the jejunum and ileum are the incarcerated segments, with a good prognosis and high rate of survival at discharge following the surgery. In the present case parts of small intestine was found in the scrotum, too. Horses with an acquired inguinal hernia or an inguinal rupture usually require immediate treatment, because the intestine that has escaped through the vaginal ring or hole in the peritoneum is likely to become strangulated, although the small intestine parts seemed to be healthy in this case. Although an acute increase in testicular size is suggestive inguinal herniation, it is also suggestive of torsion of the spermatic cord, orchitis or thrombosis of the testicular vasculature. Orchitis, epididymitis, testicular neoplasia, hydrocele, varicocele, testicular damage caused by trauma, torsion of the spermatic cord, or inguinal herniation may necessitate unilateral or sometimes bilateral orchidectomy. Although uncommon, reproductive emergencies will occur in the breeding stallion and when they do, prompt attention and action must be instituted.

References