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CASE REPORT

A Case Report: Colic Due to Jejuno-jejunal Intussusception in A Mare

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Summary

This paper reports the clinical findings, the results of diagnostic imaging, the medical management, and the results of necropsy of a 2 year old Arabian mare suffering from jejuno-jejunal intussusception. Determining clinical parameters for the in-live diagnosis were the characteristic bull´s eye appearance of a part of the small intestine at ultrasonography, tubular structures found at transrectal palpation and the abnormal peritoneal fluid obtained by abdominocentesis.

Keywords: *Mare, Colic, Jejuno-jejunal intussusceptions*

Olgu Sunumu: Bir Kısrakta Jejuno-jejunal Invaginasyon Nedeniyle Oluşan Kolik

Özet

Bu olgu sunumunda, jejuno-jejunal invaginasyonlu 2 yaşlı Arap ırkı bir kısrakta klinik bulgular, tanısal görüntüleme, medikal yönetim ve otopsi sonuçları bildirildi. Anlık teşhis için belirlenen klinik parametreler; ultrasonografide ince barsakların bir kısmının karakteristik boğa gözü görünümünde olması, rektal palpasyonda tubuler yapıların bulunması ve abdominosentez ile elde edilen anormal periteneonal sıvının belirlenmesi idi.

Anahtar sözcükler: *Kısrak, Kolik, Jejuno-jejunal invaginasyon*

INTRODUCTION

Intestinal intussusceptions are uncommon in horses. But, it must be considered in the differential diagnosis of horses with acute or chronic pain [1]. The more common forms of intussusceptions in horses are jejuno-jejunal, ileal-ileal or ileocecal [2]. The length of intestine that case become invaginated (the intussusceptum) into the more distal segment of intestine (the intussuscipiens) ranges from a few centimeters to as much as a meter. There is no breed and sex predisposition but horses younger than 3 years are affected relatively more than older animals [3-5]. Diarrhea, worm infections and polyps may predispose the horses for this condition [1,2,6,7]. Horses may be predisposed to intussusception because of enteritis, rapid dietary changes, parasitism, mesenteric arteritis, abdominal surgery, intraluminal foreign bodies and intramural masses [1,2,8]. Jejuno-jejunal intussusception was found to be the cause of colic in only 7of 310 (2.26%) horses [9]. Horses with intestinal intussusceptions exhibit signs of acute intestinal obstruction or have a chronic disease, characterized by abdominal pain, reduced apetite, weight loss, intermittent fever, soft feces and pyrexia [10].

The diagnosis and treatment of this disease can be extremely difficult [10]. History, clinical and clinicopathologic examinations are important in the diagnosis of intussusceptions. A diagnosis may be made by ultrasonography or rectal palpation, but exploratory laparotomy is the predominant method [11]. Trans-abdominal ultrasonography is a potentially useful for diagnosing intussusceptions [12-14]. The

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main goals for treating horses with colic include relieving pain, correcting physiologic imbalance and stimulating or maintaining intestinal transit. Primary treatments are aimed at decompressing the gastrointestinal tract, treating dehydration or shock, correcting electrolyte imbalances, stimulating intestinal motility [15]. Treatment of intussusception always requires surgical intervention [16]. The prognosis of the small intestine intussusception depends on many factors, including the length of the bowel affected, duration of the lesion and variability of the bowel [17]. The longer the intussusception is present and the intestine compromised, the worse the prognosis [8,9].

This paper presents a case of a jejuno-jejunal intussusception in a mare that was diagnosed with the use of ultrasonography. This condition, that is relatively simple to diagnose by ultrasonography, should be taken into account in the examination and differential diagnosis of severe colic's symptoms in young horses.

CASE HISTORY

A 2 year old Arabian mare was presented at the equine clinic of Veterinary University of Vienna for severe colic symptoms. Clinical signs included episodes of mild to severe abdominal pain. The horse had a rectal temperature of 37.8°C, the respiratory rate was 20/min and the breathing pattern was costo-abdominal, heart rate was rhythmic but its frequency was increased to 82 beats per minute (bpm) *(Table 1)*, the mucous membranes were slightly cyanotic. Various small excoriations were present on head, the rump and legs. Severe abdominal distension was observed. Abdominal auscultation revealed reduced borborygmy indicating decreased peristaltic. Blood gas analysis showed a blood pH of 7.41 with base excess (BE) of 6.4 mmol/L, hypokalemia (3.2 mmol/L) and high plasma bicarbonate (31.7 mmol/L). These parameters are given in *Table 1*.

The mare was intravenously treated with 0.5-1.0 mg/kg BW xylazine (2%); metamizol-sodium 0.2 mg/kg BW; N-butylscopolammonium bromide 25 mg/kg BW and flunixin meglumine 1.1 mg/kg BW to reduce pain. Effort was made to restore the circulation with intravenous infusion of 0.9% NaCl (1 L/h for 1 h, IV).

Table 1. *Parameters of mare associated with clinical sings*
Tablo 1. *Kısrağın klinik bulguları ile ilgili parametreler*

Parameters	Value of Mare	Reference Range
Blood pH	7.41	7.32-7.44
Base excess (mmol/L)	6.4	-2.5-2.5
Potassium (mmol/L)	3.2	3.5-4.5
Plasma bicarbonate (mmol/L)	31.7	20-28
Rectal Temperature	37.8°C	37.3-38.2
Respiratory rate (min)	20	10-14
Heart frequency (bpm)	82	30-40

At rectal examination the characteristic loops of distended small intestine were identified, the invagination however could not be reached. The peritoneal fluid obtained by paracentesis in the midline was light orange-colored, very cloudy, had an elevated total protein levels (2.8 g/dL), a nearly normal specific gravity (1.022) and an elevated lactate level (2.4 mmol/L). These parameters are summarized in *Table 2*.

Trans-abdominal ultrasound was performed with a 3.5 MHz sector transducer. In the ventral abdomen, severe peritoneal effusion was observed. Several loops of distended small intestine with thickened walls and weak peristaltic were seen. The characteristic "bull eyed" like structure suggesting small bowel intussusception was seen *(Fig. 1)*.

The clinical and ultrasonographic findings combined with the results of the peritoneal fluid analysis supported the diagnosis of intussusception of the small intestine. Surgical treatment was declined by the owner and the mare was euthanized.

At gross pathology dilated jejunal loops and hemorrhagic spots on them were apperent. After the opening of the abdominal cavity, a jejuno-jejunal intussusception, 30 cm tract of small intestine, was noticed *(Fig. 2)*.

The portion of the invaginated jejunum revealed signs of transmural necrosis and large hemorrhagic areas *(Fig. 3)*. Intense hyperemia, acute catarrhal enteritis and severe

Table 2. *Parameters of peritoneal fluid obtained by paracentesis from mare*
Tablo 2. *Kısraktan parasentezis ile elde edilen periteonal sıvı parametreleri*

Parameters	Value of Mare	Reference Range
Total protein levels (g/dL)	2.8	<2.5
Specific gravity	1.022	<1.020
Lactate level (mmol/L)	2.4	≥1.2

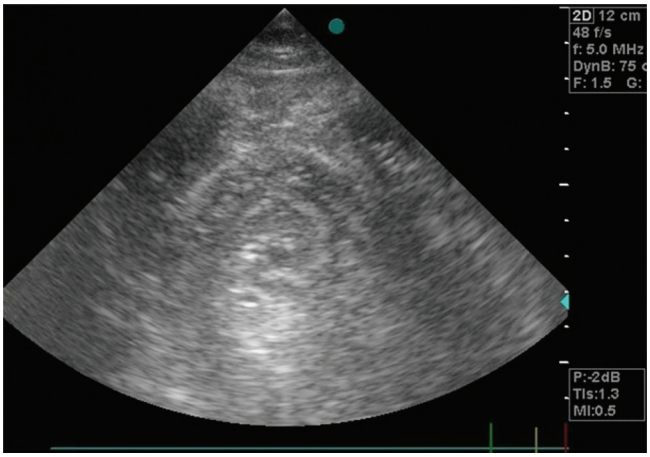

Fig 1. Ultrasonographic appearance of the jejuno-jejunal intussusception (Bull`s eye)

Şekil 1. Jejuno-jejunal invaginasyonun ultrasonografik görünümü (Boğa gözü)

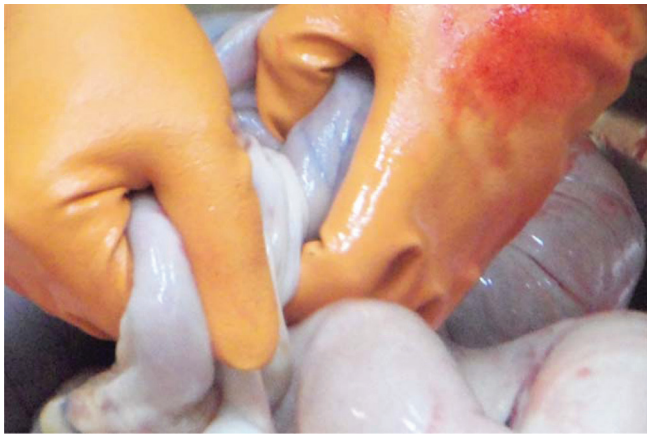

Fig 2. The anatomical macroscopic view of the jejuno-jejunal intussusceptions

Şekil 2. Jejuno-jejunal invaginasyonun anatomik makroskobik görünümü

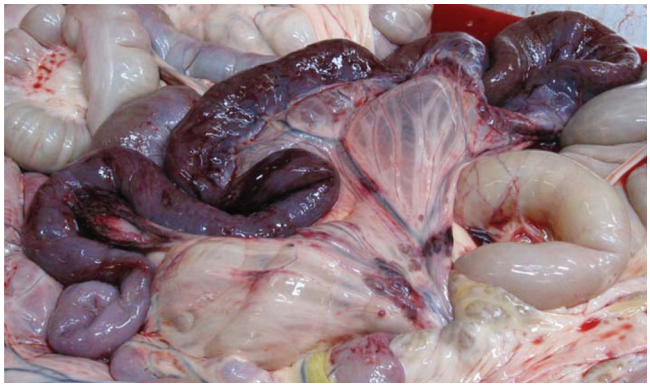

Fig 3. The invaginated part of the bowel

Şekil 3. İnvagine olan bağırsak bölümü

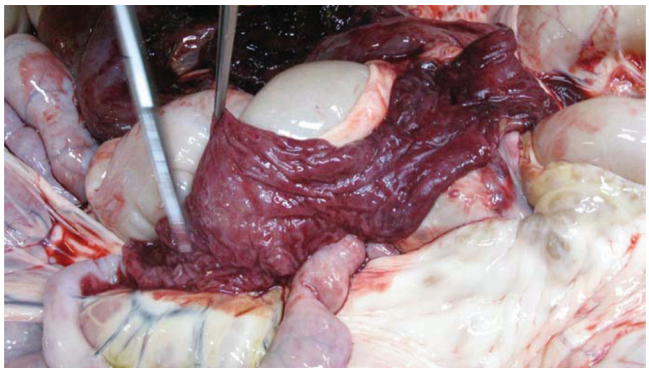

Fig 4. The macroscopic view of the lumen of the invaginated tract after the cross section

Şekil 4. Enine kesitten sonra invagine olan bağırsak lümeninin makroskobik görünümü

necrosis affected the portion of small intestine preceding the intussusception *(Fig. 4)*.

DISCUSSION

Different types of intussusception are recognized in horse such as enteric, ileoileal, ileocecocolic, cecocolic and colocolic. Usually the ileum is involved at or close to, the ileocaecal junction [9,18]. Jejuno-jejunal intussusceptions are less frequently encountered and hence its incidence is very low (2.26%) in horses [9].

Clinical signs are extremely variable depending on the degree of compromise or obstruction of the affected portion of the gut. Pain may range from intermittent mild to severe. Pain may be so uncontrollable that immediate surgical intervention is required [9,10,19,20]. In addition diarrhea and fever may be seen occasionally.

In this case, the horse had mild respiratory compromise, tachycardia, mild cyanosis likely an increased intra-abdominal pressure, a partial ileus and hypokalemic metabolic alkalosis. Hematological and blood biochemical data may be normal, as was shown by Vieitez et al.[21] in foal with jejuno-jejunal intussusceptions. On the other hand clear hematological and biochemical abnormalities are commonly seen. The findings of the current case are similar to those described by Albanese et al.[22] and Lin et al.[23]

In the present case, the young Arabian mare was presented at our clinic for severe colic symptoms. With the rectal findings and echography results the diagnosis was not difficult to make. Since intussusception is a relatively uncommon cause of colic in young or adult horses [1], this disorder may be overlooked if horses are not carefully examined.

Intussusceptions are believed to arise either as a result of segmental motility disorder or as a result of local changes in the intestinal wall [24]. Regarding the latter, a special case is the jejuno-jejunal intussusception that is reported as a complication of jejuno-jejunal anastomosis by researchers [25-27].

In humans and many animal species, transabdominal ultrasonography is an excellent diagnostic procedure to diagnose many abdominal disorders. Bell and Textor [28] suggested that transabdominal ultrasound was extremely useful for diagnosing horses with caeco-colic or caeco-caecal intussusceptions (10/12 and 4/5 horses that were scanned, respectively). The ultrasonographic characterization of intussusception has been given for men [29], foals [12], adult cattle [30], cats [31], and dogs [32]. Bell and Textor [28] could diagnose only 54% of the caecal intussusceptions by rectal palpation and/or by ultrasonography. So, in roughly half of the cases the diagnosis cannot be made by clinical examination and only at explorative surgery a definitive diagnosis can be made.

At a longitudinal sonographic view a sandwich-like appearance of the alternating loops of bowel, with a loop-within-a loop appearance is seen. Fluid distention of the more proximal small intestine may be detected, usually with normal or nearly normal wall thickness and little or no peristaltic activity [12,30,33]. If a "target" or "bull´s eye" lesion is observed, the diagnosis is definitive [12,13]. In this case, the ultrasonographic appearance of the intussusception corresponds to those previously described papers using a 3.5 MHz

transducer [30,33]. The rectal findings in this case were not conclusive but indicated a strangulative small intestinal problem and the final diagnosis was relative simply made by the pathognomic "bull´s eye" aspect seen at ultrasonography, which indicated small bowel intussusception.

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