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Case report

TREATMENT OF SCROTAL HERNIA IN FOALS

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Summary: Scrotal hernias in foals are usually congenital and not life threatening, whereas in adult stallions they are life threatening and require surgery. The treatment of hernias in newborn colts is normally conservative and surgical treatment is rarely indicated. Congenital indirect scrotal hernias are more common in foals than direct scrotal hernias. This paper is a review of the clinical signs and treatment of three foals with indirect scrotal hernias. A two-day-old foal had strangury and mild colic and a two-month-old trotter foal was surgically treated to correct a large non-reducible scrotal hernia. A three-day-old trotter foal had a reducible indirect scrotal hernia and colic, which was due to impacted meconium. There were no complications or hernial recurrences within the four months directly following the surgical procedures. The surgical treatment of congenital hernias is indicated when colic, incarceration of the intestinal loops, strangury or inguinal, scrotal or preputial oedema occur or when the hernia is so large that manual repositioning is impossible.

Key words: scrotal hernia; clinical signs; surgery; foal

Introduction

Scrotal hernias of foals are congenital and usually considered hereditary. They may be caused by an excessive outgrowth of the extra-abdominal part of the gubernaculum, which results in a vaginal process with an unusually wide neck (1). They are usually located in the left-hand side of the scrotum. Congenital hernias are either direct, which causes intermittent colic, or they are indirect - the intestine passes through the vaginal ring into the vaginal tunic - and usually asymptomatic.

Congenital indirect hernias, which are noticeable shortly after birth, are easily reduced when foals are rolled onto their back and usually resolve spontaneously within 3 to 6 months (2, 3).

Direct hernias occur when there is a rupture of the common vaginal tunic and the small intestine, and occasionally a testicle, escapes through into the subcutaneous space of the scrotum and prepuce (4). Direct or ruptured hernias in foals are evident within 4 to 48 hours of birth and cause colic, depression, severe scrotal and preputial swelling as well as oedema (5). These hernias are usually not reducible and are treated as surgical emergencies.

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Usually the jejunal loops are situated subcutaneously. Incarcerations of the large colon in congenital inguinal hernias have been reported. Abdominal compression during parturition may be responsible for ruptured inguinal hernias in foals (6, 7).

In congenital indirect scrotal hernias, intestinal loops can be palpated in the scrotum when the foal is standing and are generally unilateral. However, repositioning is difficult in the standing position, therefore, if the hernia is not too large, the foal is rolled onto its back, which makes the repositioning easy and painless. Indirect hernias should be monitored frequently due to the risk of incarceration. Incarceration should be suspected in a non-reducible umbilical hernia that increases in size and warmth, and is painful, firm, or oedematous.

Surgical corrections are recommended for direct hernias and for uncomplicated indirect hernias that do not resolve spontaneously within the first three to six months or that increase in size (4).

Surgical corrections may involve:

- an inguinal approach with castration;
- laparoscopic repair with castration (8);
- an inguinal approach without castration (9); or
- a midline laparotomy with closure of the vaginal ring.

The last two methods may cause atrophy of the testicle. In cases of direct or ruptured scrotal her-

Figure 1: Oedema of the prepuce caused by an indirect scrotal hernia

Figure 2: Indirect left scrotal hernia. Jejunal loops are in the distended vaginal sac

nia, the intestine is usually viable and no resection is necessary, although delayed necrosis is possible and has been reported (6).

History and clinical findings

Three foals with indirect scrotal hernias underwent surgery at the Veterinary Faculty's Clinic for Reproduction and Horses, in Ljubljana.

One 2-day-old Coldblood foal was brought in after the owner had noticed that it had difficulty urinating as well as intermittent mild colic. Its pulse rate (110/min), temperature (38.4 0C) and breath rate (20/min) were all normal during the clinical examination, however, the left-hand side of the scrotum was enlarged and intestinal loops were palpated. There was oedema on the prepuce (Figure 1) and the foal frequently attempted to urinate without success.

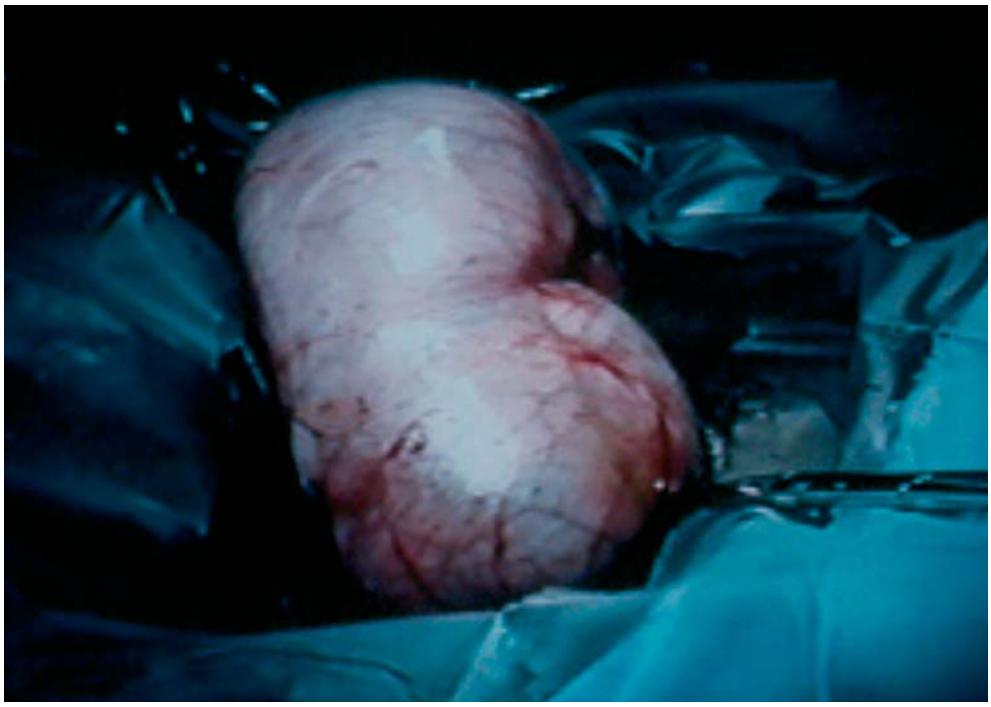

Figure 3: The dissected vaginal tunic was enlarged and very thin

Repositioning the loops was possible when the foal was in the dorsal position and 250 ml of urine was removed using a catheter. The faeces were yellow and normal. The diagnosis was an indirect left scrotal hernia with strangury.

The second foal was a two-month-old trotter. The owner had noticed a distension of the left-hand side of the foal's scrotum; otherwise the foal's behaviour was normal. During the clinical examination, the foal's pulse rate (72/min), temperature (38.0 0C) and breath rate (16/min) were normal. The intestinal loops were palpated in the enlarged left-hand side of the scrotum (Figure 2) and peristaltic movements could be seen beneath the skin.

There were no signs of discomfort or colic, however a manual repositioning was impossible. The diagnosis was a non-reducible indirect left scrotal hernia.

The third foal, a 3-day-old trotter, was depressed and lay down frequently and rolled onto his back. There were no faeces. During the clinical examination the foal's pulse rate (140/min), temperature (38.6 0C) and breath rate (40/min) were elevated. The abdominal wall was distended and there were signs of colic. Intestinal loops were present in the right-hand side of the scrotum. Repositioning was impossible because of the distended intestine. The diagnosis was an indirect scrotal hernia with meconium impaction.

Surgical procedures and results

The 2-day-old foal was sedated with 0.05 mg/100 kg of detomidine (DOMOSEDAN, Orion Pharma, Finland). 0.085 mg/kg of midazolam ((DORMICUM, Hoffman LaRoche, Swiss) and 1.5 mg/kg of ketamine HCl (KETAMINE, Veyx-Pharma GmbH, Germany) were used for the induction. We used 0.5 to 1 % halothane (FLUOTHANE, Zeneca, United Kingdom) with oxygen to maintain the anaesthesia. The skin was washed, cleaned and disinfected with chlorhexidine. A repositioning of the intestinal loops was performed before the operation. After the skin was incised over the inguinal ring, the vaginal tunic was bluntly transected. The vaginal tunic was then incised and the remaining loops (about 4 cm) were put back into the abdominal cavity. The ligament of the tail of the epididymis, which attaches the parietal tunic to the epididymis, was severed. By transecting the fold of the mesorchium and mesofuniculum, the testis, epididymis and the distal part of the spermatic cord were completely freed from the parietal tunic, bound and then removed. The external inguinal ring was closed using a continuous suture, and the skin with a Ford interlocking suture. The foal recovered 30 minutes after the operation. One hour later he had no strangury and urinated normally.

Because of the number of intestinal loops in

the vaginal cavity, we decided to treat the two-month-old trotter foal surgically. It was first sedated with 0.5 mg/100 kg of detomidine (DOMOSEDAN, Orion Pharma, Finland) and then anaesthesia was induced with midazolam (0.085 mg/kg; DORMICUM, Hoffman LaRoche Ltd, Swiss) and ketamine (2.2 mg/kg; KETAMINE, Veyx-Pharma, Germany). The anaesthesia was maintained using 1 % halothane (FLUOTHANE, Zeneca, United Kingdom) with oxygen. A large, approximately 10 cm, incision was made in the skin directly over the enlarged vaginal sac near the superficial inguinal ring. A digital dissection was used to bluntly dissect the parietal tunic from the surrounding fascia (Figure 3) and, through a thin, distended vaginal sac, peristalsis of small intestinal loops became obvious. These loops could not be forced back into the abdominal cavity when the vaginal sac was closed.

Therefore, an incision was made into the vaginal sac, the testicle and the vaginal sac were elevated and the jejunal loops (about 6 cm) were easily forced in with a finger through the vaginal ring and into the abdominal cavity. The testicle was removed as described in the first case. The parietal tunic was also removed to the level of the external inguinal ring. The ends of the parietal tunic, the subcutis and the skin were sutured, while the external inguinal ring was closed using continuous sutures. The foal recovered well from anaesthesia within 30 minutes and had neither complications nor any recurrence of the herniation during the 4 months immediately following the surgery.

The three-day-old trotter foal was operated because of an impaction of the meconium. The indirect scrotal hernia was a consequence of the impaction. For the sedation, premedication and anaesthesia we used the same drugs and doses as per the first case. After the laparotomy, the distended loops of the jejunum protruded through the wound. A needle was used to puncture the intestine to allow the gases to escape. The impaction was in the descending colon, cranial of the pelvis, and the meconium, which could not be forced into the rectum, was forced cranially into a loop that could be elevated out of the abdomen. The faecal matter was removed after an incision was made in the intestine, which was then sutured in two layers using a Cushing suture (Biosin, USP 3-0). The abdominal wall and the subcutis were closed with a continuous, absorbable suture. The skin was stitched with an interrupted non-absorbable suture. After the foal's hour-long recovery from the anaesthesia it no longer displayed signs of colic and normal, yellow faeces were voided two hours later. The indirect scrotal hernia was not surgically treated, because it was a consequence of the distension of the intestine. It disappeared after being manually manipulated. As with the other foals, there were no complications and no recurrence of the herniation during the four months immediately following the surgery.

Discussion

Congenital indirect scrotal hernias in foals are usually reducible, whereas acquired inguinal indirect hernias in adult horses commonly result in the strangulation of the small intestine and are surgical emergencies (10, 11). The surgical correction of a congenital indirect hernia is indicated if it does not resolve spontaneously, if the vaginal tunic ruptures (4) or if the owner is concerned because of an apparent increase in size of the hernia (4, 8). In acquired hernias, the intestine of an adult horse will become strangulated before it reaches the testis, whereas in foals a length of intestine can reach the fundus of the vaginal sac without strangulation. In the case of the two-month-old trotter foal, the owner noticed the enlargement of the left-hand side of the scrotum even though the foal had not displayed any discomfort since its birth. Despite the length of intestine in the vaginal sac, no strangulation had occurred. Some congenital inguinal hernias are caused by an excessive outgrowth of the extra-abdominal part of the gubernaculum. This results in a vaginal process with an unusually wide neck (1) and is the likely cause of the hernia in this instance. The vaginal ring in foals with a reducible indirect inguinal hernia is probably much wider than it is in foals with direct inguinal herniation where rupturing of the inner hernia sac occurs (6). In both our cases, the replacement of the intestine during the operation was easy, particularly as the vaginal ring of the two-month-old trotter was very wide.

In the first case, it was obvious that the indirect scrotal hernia had caused the strangury, preputial oedema and the foal's straining while trying to urinate. The mild colic was probably due to strangury as there was no evidence of a strangulation of the intestine present during the operation. The signs

disappeared immediately after the operation and the foal urinated normally without discomfort. An indirect hernia such as this can probably develop into a direct hernia due to the intermittent straining of the foal while trying to urinate. Van der Velden assumed that a direct inguinal hernia in newborn colts actually starts out as an indirect inguinal hernia; intestinal loops pass through the vaginal ring into the vaginal cavity and subsequently the parietal vaginal tunic ruptures. In foals with a direct inguinal hernia where the vaginal ring is still intact, it is very difficult to manoeuvre the prolapsed loops back through the narrow vaginal ring and into the abdomen and it is much easier to replace them after enlarging the rent up to the vaginal ring. Abdominal compression during parturition may also be responsible for ruptured inguinal herniation in foals.

In the third foal that we treated, the indirect scrotal hernia was a result of the meconium impaction. After surgically removing the impaction it was sufficient to just manually reposition the hernia, which then reduced within 5 days.

Although surgical treatment is occasionally required, most indirect scrotal hernias in foals usually reduce spontaneously with daily manual repositioning of the intestinal loops. Strangury is an indication for the surgical treatment of a congenital indirect scrotal hernia.

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ZDRAVLJENJE PRIROJENE MODNIKOVE KILE PRI ŽREBETU

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Povzetek: Modnikove kile so pri novorojenih žrebčkih pogosto prirojene in redko ogrožajo življenje, medtem ko so pri odraslih žrebcih pridobljene in življenje ogrožajoče. Večinoma so pri novorojenih žrebčkih prirojene kile ozdravljive konzervativno, le redko je potrebno kirurško zdravljenje. Pogostejše so posredne kot neposredne prirojene kile.

Članek opisuje klinično sliko in zdravljenje treh žrebčkov s posredno modnikovo kilo. Dva dni star hladnokrvni žrebček je kazal znake strangurije in blage kolike. Dva meseca star kasaški žrebček je bil kirurško zdravljen zaradi obsežne nereponibilne posredne kile. Tri dni star kasaški žrebček je kazal znake kolike zaradi zapeke (obstipacije mekonija), hkrati pa je imel reponibilno posredno kilo. Ob kontroli 4 mesece po operaciji ni bilo komplikacij ali ponovne kile.

Kirurško zdravljenje prirojenih kil je potrebno, kadar se pojavijo količne bolečine, vkleščenje vijug, težko uriniranje, oteklina v področju dimeljskega kanala, moda ali prepucija ali kadar je izpad črevesja tako obsežen, da ročna naravnava ni možna, kljub temu da žrebček nima znakov kolike.

Ključne besede: modnikova kila; klinična slika; kirurgija; žrebe