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Use of an automatic stapling device during castration to prevent (re)occurrence of inguinal hernia in horses with large vaginal rings

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1. Introduction

Horses with large vaginal rings are considered at risk for inguinal herniation. In order to avoid / treat this pathology, beside laparoscopic techniques, closed sterile castration has been used when the horse had no reproductive value or in case of testicular compromise. However, even after hand-sutured closure of the vaginal tunic, inguinal herniation may occur / recur. The objectives of this report were to describe the use of an automatic stapling device (TA 90 4.8mm staple length, United States Surgical, USA) for vaginal closure during castration by an inguinal approach in horses with large vaginal rings in order to prevent (re) occurrence of inguinal hernias and to report the follow up on these cases.

2. Materials and methods

Four intact males with large vaginal rings were included in the study: a horse of unknown breed (2.5 year, 300 kg) with permanent non strangulated left inguinal hernia and right hydrocele since purchase 3 weeks earlier (case 1), a Spanish horse (10 years, 483 kg) with a right inguinal hernia successfully corrected by massage one week prior to the surgery (case 2), 1 Rheinland foal (4 months, 200 kg) presented for mild colic signs, depression and with right hydrocele and left inguinal hernia corrected by external reduction and application of an inguinal splint (case 3). This foal had undergone a bilateral partial closure of the superficial inguinal ring for correction of inguinal hernias at the age of 2 weeks in another clinic but inguinal hernia had recurred the very day of presentation to our clinic. Case 4 was a Lusitanian horse (18 years, 493 kg) with a right neoplastic cryptorchid testicle. The tumour had a diameter of approximately 25 cm and was located in the inguinal canal. All cases had at least one enlarged vaginal ring (from approximately 6 to 15 cm width). All horses were placed in dorsal recumbency under general anaesthesia and, if still present, the inguinal hernia was corrected by external massage. Horses were castrated via an inguinal approach. After skin incision and blunt dissection of the subcutaneous tissue, the vaginal tunic containing the testicle was exteriorised and incised. The testicle was removed after hemostasis of the testicular vessels with a vessel sealing device (Ligasure, Valleylab, USA). Then the most proximal part of the vaginal tunic was closed with the TA90 autosuture instrument, and the exceeding part of the vaginal tunic was resected leaving approximately 5 mm edges after hemostasis of the cremaster muscle by the vessel sealing device. The staples were oversewn with a continuous suture pattern (2-0 poliglecaprone 25 or polyglactin 910). The TA90 device was used bilaterally in case 1 and unilaterally (in the hernia side or the tumoral side) in the 3 other cases. Where the TA90 device was not used, the vaginal tunic was transected as proximally as possible and hand sutured using a simple continuous pattern. One horse (case 1) underwent a closure of the superficial inguinal ring bilaterally and one (case 4) unilaterally. Subcutaneous tissues and skin were closed in a routine manner in all horses. Subcutaneous drains were placed in the right inguinal region of the cryptorchid horse (case 4) because of the very large dead space post-surgery. All horses received antibiotic and anti-inflammatory drugs perioperatively.

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3. Results

No (re)ocurrence of inguinal hernia was observed in these horses/foal. Histological analyses were performed on both testicles of the foal (case 3) and on the right testicle of case 2 (one week after inguinal hernia) and revealed a testicular hypoplasia / degeneration, confirming the necessity of castration. Histological analysis of the neoplastic testicle weighing 4.7 kg (case 4) revealed a seminoma. The postoperative period was uneventful (case 2) or included minor complications like hematoma / seroma, which were successfully treated by small draining incisions (cases 1 and 3). Because of the large size of the tumor and the subsequent large dead space, the cryptorchid horse developed an abscess in the inguinal region that was successfully drained and flushed after removing part of the skin and subcutaneous sutures. For the long term follow up (5 months – 2 years), owners reported no complication or recurrence of the clinical signs. All animals returned to their previous use and no orthopedic problems were reported in relation to the placement of staples.

4. Discussion

Prevention / treatment of inguinal hernia or hydrocele have previously been described by intracorporeal suture closure of the internal inguinal and vaginal rings by laparoscopy [1]. This technique is minimally invasive but requires expertise because of paramount importance of portal placement and the technique involved in intracorporeal suturing [1]. Other techniques of laparoscopic inguinal hernioplasty using a mesh [2] or a peritoneal flap [3] have also been reported, but they also require specific equipment and expertise. Stapling devices used for the closure of the vaginal tunic during castration by the inguinal approach have the major advantage that they do not require particular technical skills or expensive equipment. Furthermore, because of even suture-line tension, the vaginal tunic closed by a double row of staggered staples likely offers more resistance to abdominal pressure than if hand sutured, thus efficiently preventing hernias. The TA staple technique appears to be safe, fast and easy. Castration should not be considered a major disadvantage of the technique as most patients with long lasting inguinal hernias present testicular degeneration and are infertile [4,5], which is supported by abnormal testicular histology in this report. In the present study, the TA90 device with 4.8mm staple length was used in all cases, but devices with shorter staple lines or staple leg could probably have been used in cases with narrower and thinner vaginal tunics. The postoperative fluid collections that have been observed were related to a large postoperative dead space and might have been avoided by removing the entire scrotum. Apart from the inguinal abscess in relation with the very large neoplastic testicle (case 4), which required prolonged care, the other complications resolved within a few days. Therefore, complications associated with the technique can be considered minimal. In conclusion, (re)ocurrence of inguinal hernia in case of very large vaginal rings may simply be prevented by closure of the vaginal tunic by TA staples during castration by inguinal approach. This method provides a good resistance to internal pressure, appears to be safe, fast and easy to perform and may therefore be an interesting alternative to laparoscopic techniques when castration is considered.

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