

Postcastration adhesions: clinical signs, diagnosis, treatment and prognosis in 20 horses

Mickael Patrice Robert,^{1,*} Fleur Couturier,² Poppy McGeown,³ Olivier Geffroy,²

Caroline Tessier²

¹Department of Companion Animal Clinical Studies, University of Pretoria Faculty

of Veterinary Science, Onderstepoort, Gauteng, South Africa

²Equine Surgery, ONIRIS, Nantes, France

³Equine Department, University of Melbourne Veterinary Clinic and Hospital, Werribee, Victoria, Australia

*Correspondence to Dr Mickael Patrice Robert; email: dr. mickael. robert@ gmail. com

Abstract

The main goal of this short communication is to report the clinical signs, diagnostic modalities, surgical treatment and prognosis associated with postcastration adhesions. Twenty horses, castrated on average 30 months prior, presented for back pain, hindlimb lameness, jumping problems, behavioural issues or persistent preputial oedema. Cases displayed a tight fibrous band between the scrotal scar and the superficial inguinal ring. After a complete lameness examination was performed, all horses were operated under general anaesthesia in dorsal recumbency to resect the adhesions using two different techniques. Particular attention was given to haemostasis and to minimise tissue trauma. Five horses were lost to follow-up. Subjective improvement occurred between one week and six months after surgery in 10 out of 12 of the horses according to owners' evaluation. Horses with competition records available (n=15) had their first start 180±155 days after surgery. Overall client satisfaction with the technique was good (83 per cent).

Background

Castration is probably the oldest and most common surgery performed in equine practice.¹ Many postoperative complications, some of them life-threatening, can occur following this procedure. The most frequently described complications are evisceration, haemorrhage, oedema, funiculitis, peritonitis, penile trauma, hydrocoele and persistent masculine behaviour.^{2,3} In addition to these complications, postcastration adhesions have been defined as an acquired condition of geldings leading to an irregular gait and to behavioural disorders.⁴ Several authors have acknowledged the possibility of inguinal pain to be a potential cause of gait abnormality⁵ and that lameness can develop weeks after castration in association with abnormal firm tissue in the region of the surgical scar.^{1,6,7} Yet postcastration adhesions, for a long time, were only described in the French literature.⁸ Up to 20 per cent of French veterinarians were reported to face postcastration adhesions in their practice.⁹ In 2006, Echte

and others¹⁰ reported on 21 cases of postcastration adhesions causing hindlimb lameness treated surgically in the German literature.

The main goal of this short communication is to report the clinical signs, diagnostic modalities, surgical treatment and prognosis associated with postcastration adhesions in 20 horses.

Case presentation

The records of all horses surgically treated at the ONIRIS Equine Clinic between January 2007 and March 2016 after a diagnosis of postcastration adhesions has been made were retrospectively reviewed. Collected data included signalment of the horse, discipline, owners' complaints, time elapsed since castration, clinical findings on lameness examination, concurrent diagnostic imaging findings, date and technique of the surgery, and treatments received.

After surgery to remove the adhesions, owners were contacted by phone by two of the authors (PM or FC) to determine their level of satisfaction using a standardised questionnaire. Times of return to competition were obtained using online databases (www.ffecompet.ffe.com for sport horses and www.zone-turf.fr for racehorses). Descriptive statistics were used.

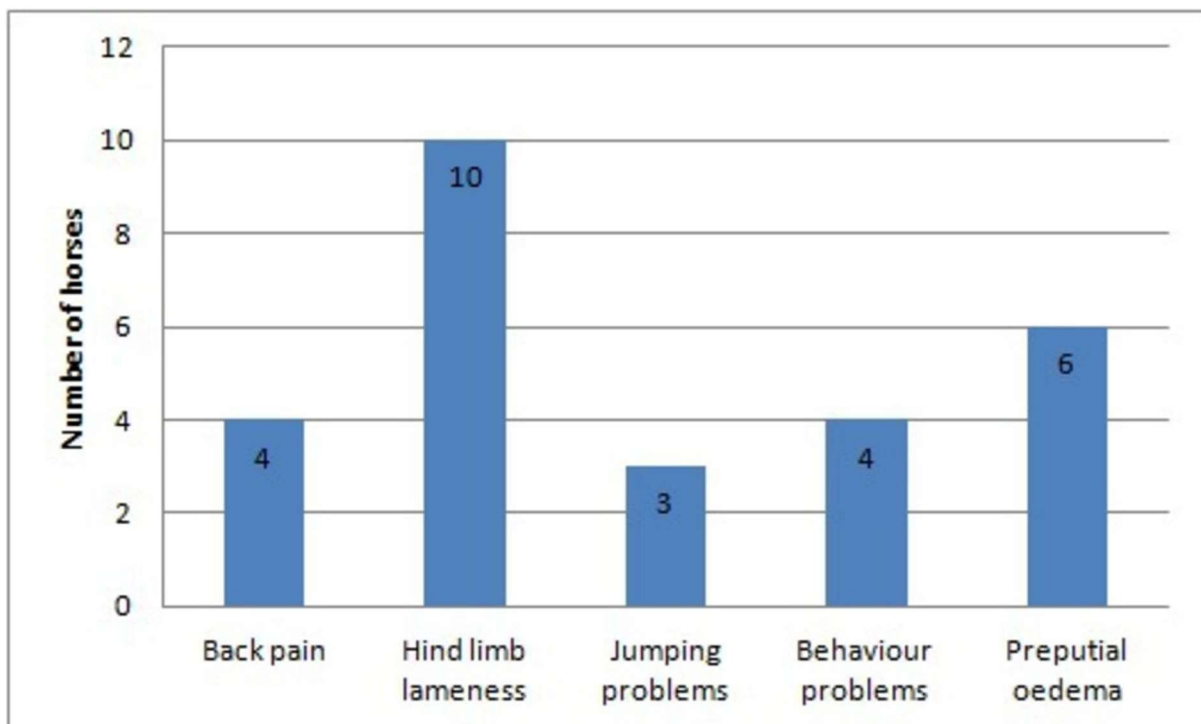


Figure 1. Presenting complaints of 18 horses found to have postcastration adhesions. Some horses presented with more than one issue.

Twenty horses aged 3–12 years old (mean±sd 6.2±2.7) were treated for postcastration adhesions during the study period. The minimum follow-up period was nine months. There were 11 Selle Français, two Zangersheide, two French trotters, one Hanoverian, one Oldenburg, one Andalusian, one Luxembourg sport horse and one Anglo-Arab. Trotters were involved in racing, whereas the other horses were involved in show jumping (11 horses),

eventing (three horses), dressage (three horses) and pleasure riding (one horse). Postcastration adhesions were unilateral in eight cases and bilateral in 12. They were detected a mean of 29.9 months after castration in 11 horses where castration date was available. Infectious complications after castration were reported in the history of two horses. Owners' complaints for 18 horses are presented in figure 1. Two additional horses were referred for adhesion removal without history.

Investigations

On scrotal examination, all horses had a visible depression on the side(s) of the adhesion, making a funnel-like appearance in the scrotal region (figure 2). On palpation, all showed a tight fibrous band running from the scrotal scar to the superficial inguinal ring. Palpation of the adhesion sometimes elicited painful reaction from the animal (three horses). Other abnormalities detected were back pain (seven horses), hindlimb lameness (six horses), positive response to hindlimb flexion (five horses) and purulent discharge in the scrotal area in one bilaterally affected horse. One horse had its spermatic cord anaesthetised, as described by Echte and others,¹⁰ using 30 ml of lidocaine, leading to dramatic improvement in locomotion.



Figure 2. Photograph of the left scrotal region of a horse with postcastration adhesion. The red arrow highlights the funnel-like appearance of the scrotal region.

Differential diagnosis

Concurrent musculoskeletal lesions detected on radiographs and ultrasound were grade 1 impingement of the dorsal spinous processes (two horses), osteoarthritis of the thoracolumbar synovial intervertebral articulations (three cases), sacroiliac arthropathy (three cases), stifle osteochondrosis (one case) and distal tarsal osteoarthritis (one case).

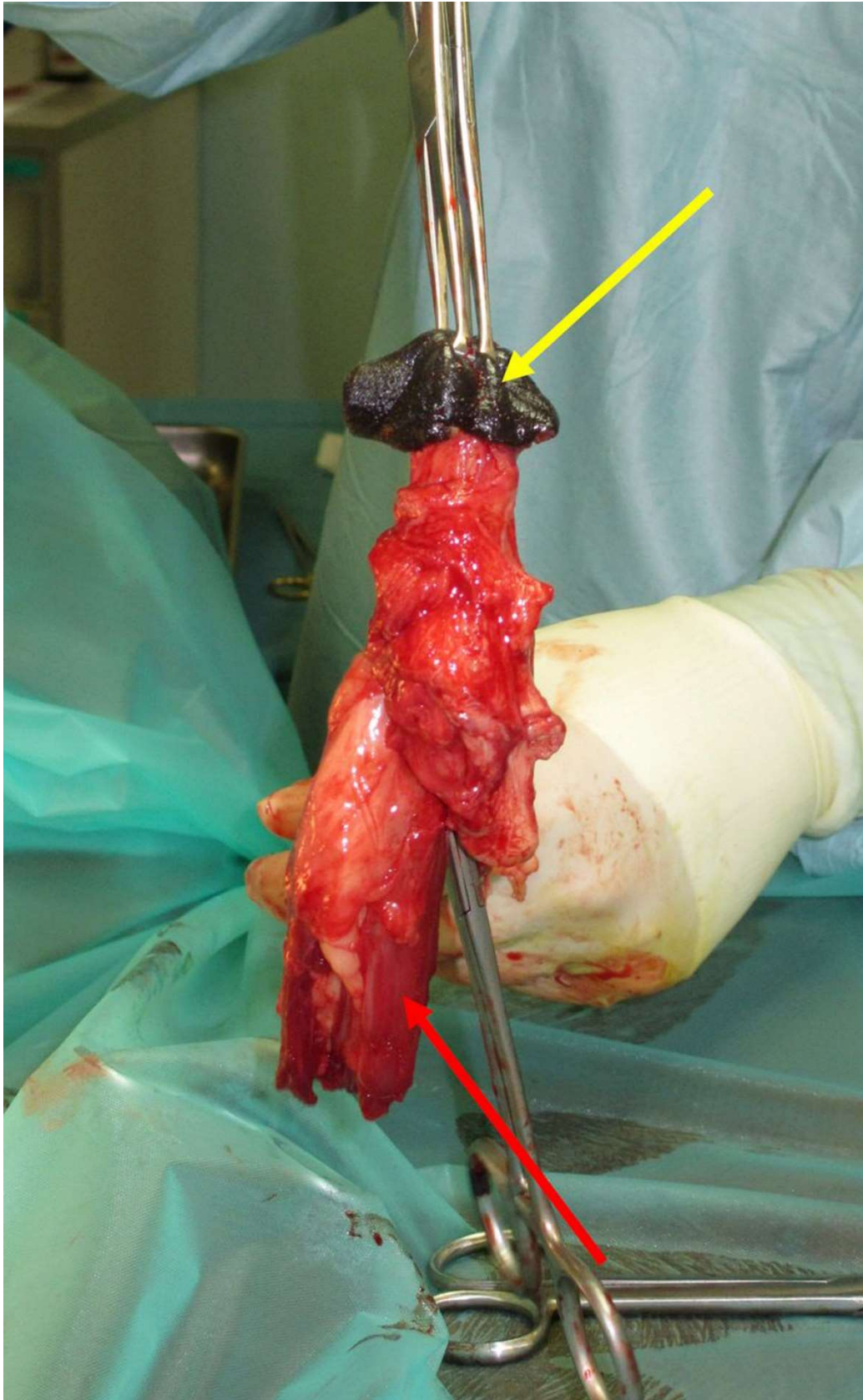


Figure 3. Photograph of a surgically removed postcastration adhesion using a technique involving an elliptical skin incision around the scrotal adhesion and transection of the spermatic cord distal to an emasculator. The red arrow highlights the cremaster muscle. The yellow arrow shows the resected scrotal skin where the adhesion was.

Treatment

All horses were operated under general anaesthesia in dorsal recumbency, and received prophylactic antibiotics and NSAIDs similar to closed castrations.¹¹ Two surgical techniques were used depending on surgeons' preference. The first technique used an inguinal incision performed over the superficial inguinal ring on the side(s) of the adhesion. The spermatic cord covered by the vaginal tunic was isolated using minimal blunt dissection and two emasculators were applied for five minutes, one proximal close to the superficial inguinal ring and one distal close to the scrotum. The cord was resected between the emasculators and the incision was closed in three layers: inguinal fascia, subcutaneous tissue and skin. The other technique involved an elliptical skin incision around the scrotal adhesion. The spermatic cord covered by the vaginal tunic was bluntly isolated and one emasculator was applied for five minutes close to the superficial inguinal ring. The cord was transected distal to the emasculator and the incision was closed in three layers (figure 3).¹¹ In both cases no ligatures were used on the cord and particular attention was given to haemostasis and to minimise tissue trauma.

Postoperatively horses received six days of phenylbutazone (Equipalazone, Dechra). Owners were asked to restrict exercise to hand-walking for five days and then to walk and trot their horse for 20 minutes for 10 days before resuming normal exercise.

Horses presenting additional orthopaedic conditions were treated via mesotherapy (two horses before adhesion resection, one horse during the same hospitalisation), sacroiliac injection (one horse at the same time as adhesion removal), copolymer of fatty acids (one horse before adhesion resection) and stifle arthroscopy (one horse two months after adhesion removal).

Outcome and follow-up

Five horses were completely lost to follow-up. An additional three horse owners could not be reached on the phone. Subjective improvement, meaning that horses were able to resume their intended use, occurred in 83 per cent (10 of 12 horses) according to owners' evaluation. It took between one week and six months before the improvement was observed. Horses with competition records available (n=15) had their first start 180±155 days after surgery. Overall client satisfaction with the technique was good (83 per cent).

Discussion

Adhesions between the spermatic cord and the scrotal skin after castration can lead to several signs such as hindlimb lameness, back pain, jumping difficulties, preputial oedema and abnormal behaviour. Suspected causes for adhesions to develop include an increased length of spermatic cord and/or vaginal tunic remaining following castration or an infection developing along the cord.^{5, 8, 9} Another potential cause is castration using 'casseaux'. This antique technique of castration uses two grooved pieces of rot-resistant wood, 14–16 cm long, united by a string, to perform cross-clamping of the covered spermatic cord for several days.^{12, 13} It is still used in draft breeds and working horses in French Camargue to supposedly reduce the risks of evisceration and haemorrhage.^{14, 15} This method has been associated with a 5 per cent risk of adhesions.¹⁶

Gait alterations have previously been reported in 71 per cent of horses affected by adhesions.⁹ Hindlimb lameness, back pain and jumping issues were observed in the present cases. The authors suggest that when the hindlimb ipsilateral to the adhesion is fully extended, the adhered spermatic cord is put under tension between the lumbar (mainly the psoas region) and the scrotal skin, leading to pain during exercise. This repetitive pain could lead to secondary lesions and compensations and to behavioural changes.¹⁷ Interestingly, the lameness often appears unilateral even in cases of bilateral adhesions.¹⁰

The presence of oedema associated with postcastration adhesions is interesting and could be explained by a former infection,^{8,9} an altered local blood supply or even the repeated contractions of the adhered cremaster muscle.¹⁰

Even though the use of emasculators during surgery is undoubtedly leaving crushed tissue in situ,¹ the authors believe this technique causes less tissue reaction than ligatures on the spermatic cord.

The prognosis after surgical treatment is good. The results (83 per cent of both client satisfaction and patient improvement) are comparable with others where 85 per cent⁴ to 86 per cent¹⁰ of horses resumed exercise.

The limitations of this study are its retrospective nature, the low number of cases and the subjectivity introduced by owners' perception of success. Also, the difficulty in establishing a definitive link between the presence of adhesions and altered locomotion and/or behaviour and the fact that half of the patients of this study had additional orthopaedic lesions which could account for lameness or poor performance might have biased the results.

Learning points

- Postcastration adhesions are a current problem in geldings.
- Adhesions can cause gait and behaviour alterations as well as preputial oedema.
- Majority of horses show improvement following surgical treatment.

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References

¹Schumacher J. Testis. In: J Auer, J Stick, eds. *Equine surgery*. 4 edn. St. Louis: Elsevier, 2012: 804–840.

²Searle D, Dart AJ, Dart CM, et al. Equine castration: review of anatomy, approaches, techniques and complications in normal, cryptorchid and monorchid horses. *Aust Vet J* 1999; 77: 428–434.

- ³Embertson RM. Selected urogenital surgery concerns and complications. *Vet Clin North Am Equine Pract* 2008; 24: 643– 661.
- ⁴Giniaux D. Les adhérences de castration. *Prat Vet Eq* 1976; 8: 73– 77.
- ⁵Palpation RM. Diagnosis and management of lameness in the horse. 2 edn. St. Louis: Elsevier, 2011: 43–63.
- ⁶Moll HD, Pelzer KD, Pleasant RS, et al. A survey of equine castration complications. *J Equine Vet Sci* 1995; 15: 522– 526.
- ⁷O’Neill F, Theiss F. The most common procedure: castration. In: Primary closure or second intention healing? ECVS annual scientific meeting. Lisbonne, Portugal, 2016: 50–53.
- ⁸Desmaizieres L-M. Les complications de castration. 32èmes Journées annuelles de l'AVEF. Pau, France, 2004: 387–394.
- ⁹Meunier J-C. Evaluation des facteurs de Risque liés La castration chez le cheval. Lyon: Université Claude Bernard, 2000.
- ¹⁰Echte A-F, Schmidt-Ott C, Claaßen W, et al. Lameness of horses caused by adhesion of the spermatic cord-a delayed complication of castration. *PHK* 2006; 22: 445–448.
- ¹¹Robert MP, Chapuis RJJ, de Fourmestraux C, et al. Complications and risk factors of castration with primary wound closure: retrospective study in 159 horses. *Can Vet J* 2017; 58: 466–471.
- ¹²Cadiot PJ. Les exercices de Chirurgie hippique a l'Ecole d'Alfort. Paris: Asselin et Houzeau, 1895.
- ¹³Gourdon J. Traité de la castration des animaux domestiques. Paris: Asselin, P, 1860.
- ¹⁴Hureau FAC. La castration du cheval normalement conformé: État des différentes alternatives disponibles en 2010. Thèse de doctorat vétérinaire: Faculté de Médecine de Créteil, 2010.
- ¹⁵Dapoigny L. Techniques chirurgicales de castration chez Le cheval normal et cryptorchide: support audiovisuel: Faculté de Médecine de Créteil, 2003.
- ¹⁶ Association Vétérinaire Equine Française. Note d’information et consentement préalable à la castration, 2003.
- ¹⁷Bussièrès G, Jacques C, Lainay O, et al. Development of a composite orthopaedic pain scale in horses. *Res Vet Sci* 2008; 85: 294– 306.