



A RARE LATE POST-CASTRATION COMPLICATION IN A BITCH – A CASE REPORT

M. PASKALEV, A. ANTONOV, R. GARNOEVA & R. SIMEONOV

Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria

Summary

Paskalev, M., A. Antonov, R. Garnoeva & R. Simeonov, 2018. A rare late post-castration complication in a bitch – a case report. *Bulg. J. Vet. Med.*, **21**, No 3, 371–377.

A clinical case of a post-castration complication in a bitch is reported. In the paralumbar region, a fistula-forming granuloma located caudally to the left kidney was observed. Granuloma was formed around a piece of multifilament non-absorbable thread used for ligature during an ovariohysterectomy performed two years ago. The operative removal of the granuloma was accompanied by left nephrectomy. The post operative period was smooth and 4 months later, the dog was clinically healthy.

Key words: abdominal fistula, bitch, ovariohysterectomy, complications

Spaying surgery in female dogs is an abdominal operation which could entail various complications. Intraoperative and early post-operative complications are bleeding of different origin (Pearson, 1973), trauma of organs, torn stitches and organ prolapse (Blacklock *et al.*, 2016), peritonitis (Dorn, 1977). Later complications comprise stump or uterine pyometra (when only ovaries have been removed), formation of granulomas or abscesses around nonabsorbable ligatures, hydronephrosis after accidental ligation of ureters (Mesquita *et al.*, 2015), pyelonephritis, formation of rectovaginal, cytovaginal, vaginoperitoneal and abdominal fistulas (Gadelha *et al.*, 2004; Holt *et al.* 2006; Johnson-Neitman *et al.*, 2006),

ovarian remnant syndrome (Wallace, 1991; Ball *et al.*, 2010) etc. All these complications are most commonly caused by poor asepsis and antisepsis, improper operative technique and period for castration, improper suture material and inadequate post-operative care.

Foreign bodies, occurring through various pathways in the body, provoke tissue response that could result in their migration, resorption, encapsulation, purulation and fistulation (Koychev & Hubenov, 1994).

The aim of the present case report was to present a rare case of late post-castration complication in a bitch that should be considered in the differential diagnosis of fistulas in the paralumbar region.

Case presentation. A 5-year-old female Epagneul Breton, weighing 14 kg was referred for examination and treatment to the Small Animal Clinic, Faculty of Veterinary Medicine at the Trakia University – Stara Zagora, Bulgaria with a 6-month history of a hazelnut-size swelling in the left paralumbar region, which later opened spontaneously to let out about 20 mL rose-coloured discharge. Afterwards, a fistula has formed, that occasionally opened and closed on its own without influencing the general condition of the dog. The dog was nulliparous and has been spayed two years ago after a normal estrus. The ovariohysterectomy was done through median laparotomy. The post-operative period was smooth, without complications. Before being brought to the clinic, the fistula of the dog has been surgically processed several times, but without result.

The initial examination established a fistula in the left paralumbar region, about 1 cm of size, with scarce amount of exudate (Fig. 1). The skin in the area was of reduced elasticity and a scar from a previous surgery was well visible. After pass-

ing a probe, the fistula tract length was about 7 cm, directed cranially from the opening. Abdominal and vertebral radiographs were made with a stationary X-ray apparatus (TUR 800-1, Germany; 60 kV, 8 mAs; without Bucky-Potter grid). There were no pathological changes on lumbar and thoracic vertebrae. At the level of kidneys, below the lumbar vertebrae, a radiodense shadow with irregular shape was observed (Fig. 2). Complete blood counts and blood biochemistry did not deviate from normal ranges except for slightly elevated alkaline phosphatase activity (Table 1). After general anaesthesia, operative revision of the fistula and its tract was performed again, but no foreign body was found out. The tract passed through the entire abdominal wall, among the muscles and attained the peritoneum. The operative wound was sutured partially and subcutaneous treatment with amoxicillin (Synulox[®], Zoetis Belgium SA, Belgium) was initiated – 1 mL/10 kg for 7 days along with local processing of the fistula with povidone iodine (Braunol, B. Braun Melsungen AG, Germany). Abdominal ultrasound was performed (Min-



Fig. 1. Appearance of the dog at its referral to the clinic.



Fig. 2. Lateral abdominal radiograph demonstrating an irregularly shaped radiodense shadow of unknown origin.

Table 1. Time course of some haematological and blood biochemical parameters in a bitch with post castration complication and after nephrectomy

Parameters	Normal range	Before surgery	1 week post surgery	2 weeks post surgery	4 months post surgery
Haemoglobin (g/L)	120–180	132	108	116	173
Erythrocytes (T/L)	5.5–8.5	5.97	4.43	4.66	7.36
Haematocrit (%)	37–55	37.6	27.7	29.8	51.3
Leukocytes (G/L)	6–17	13.1	20.0	18.3	8.9
Platelets (G/L)	160–430	505	356	321	302
ASAT (U/L)	15–40	64	58	45	41
ALAT (U/L)	15–55	39	52	47	39
Alkaline phosphatase (U/L)	1–85	119	463	227	95
Urea (mmol/L)	1.7–7.4	5.8	4.6	6.1	4.1
Creatinine (µmol/L)	40–120	89	89	104	109

dray DC–6 Vet, China, convex transducer, 6.5 MHz), and a hypoechoic homogenous formation caudal to the left kidney, 21/16 mm of size, was identified (Fig. 3).

Two weeks later, median laparotomy was performed. The thorough examination revealed a solid formation, 3 cm of size, adhered to the caudal part of the left kidney and the abdominal wall. The removal of the formation only was impossible, so

nephrectomy was done (Fig. 4). The fistula tract communicated with the internal abdominal wall surface. In the centre of the formation, a piece of multifilament non-absorbable thread was found out (Fig. 5).

Specimens for histopathological study were fixed in 10% neutral formalin and processed routinely (Dzhurov *et al.*, 1989; Dyakov *et al.*, 1989). The 4 µm cross sections were stained with haematoxylin-eosin

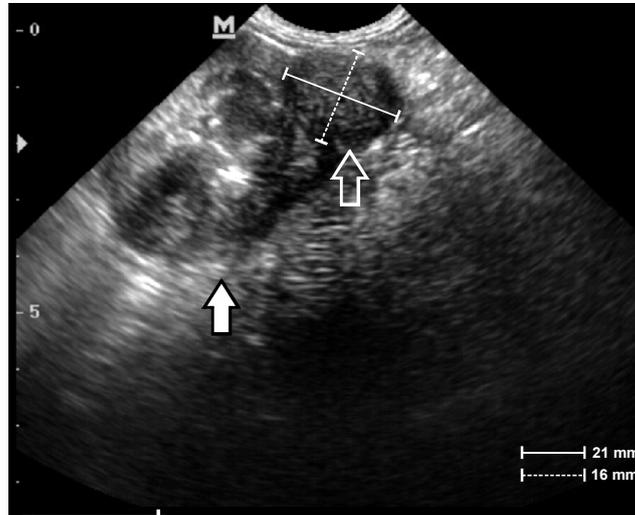


Fig. 3. Ultrasound findings: granuloma (hollow arrow); kidney (solid arrow).



Fig. 4. Intraoperative view of the formation and the kidney.



Fig. 5. Gross appearance of the kidney and the formation, in whose central part, a node of multifilament thread could be seen (arrows).

(H/E). Granulomatous inflammation with predominance of epithelioid cells and numerous lymphocytes among them were found out (Fig. 6). In some areas, eosinophils were also observed.

The post-operative period was smooth. The operative wound and the fistula healed within 2 weeks. Blood analysis demonstrated mild anaemia and leukocytosis with a trend to normalisation during the first and second weeks post surgery. By the end of the 4th post operative month, all blood parameters were within the normal ranges (Table 1).

The causes for appearance of fistulas in dogs are different and comprise soft tissue traumas, foreign bodies (including suture material), infections, congenital abnormalities etc. (Daigle *et al.*, 2001). At the base of paralumbar fistulas, osteomyelitis or discospondylitis of lumbar vertebrae could be observed (Krastev *et al.*, 2008). In our patient, the repeated surgical management did not detect a foreign body, but on the radiograph, a dense irregular shadow around the left kidney was

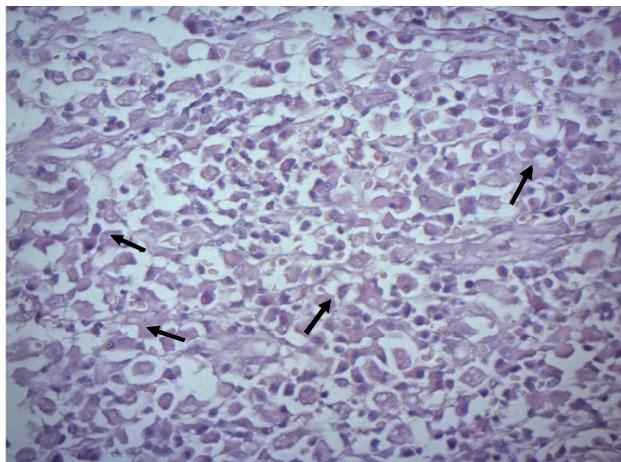


Fig. 6. Granulomatous inflammation. Epithelioid cells (arrows) are predominating, with numerous lymphocytes among them. Eosinophils were observed in some areas, H & E, magnification 40 \times .

identified. The diagnostic ultrasound confirmed the presence of a formation caudal to the left kidney and connected with it, histopathologically classified as granuloma.

The formation of granulomas in this region has been described as post-castration complication of occurrence of nylon or other nonabsorbable ligatures (Johnson-Neitman *et al.*, 2006; Mesquita *et al.*, 2015), as well as consequently to compromised surgical asepsis (Kelly *et al.*, 2016). In our case, no information was available on the nature of material used to ligate the ovarian blood vessels, but there were remnants of a multifilament thread, possibly nonabsorbable. Its discovery 2 years after the spay confirmed this hypothesis.

The opinions about whether nonabsorbable suture material could induce inflammation with granuloma are contradictory (Adin, 2011). The occurrence of this complication is more probable if poor asepsis is combined with nonabsorbable suture material. The disease history of the patient provided no data for any early postoperative complications due to poor

asepsis. The fistula on the basis of granuloma appearing 2 years after the castration without any other local or systemic clinical signs confirmed that the nonabsorbable ligature was the cause. Encapsulation and fistulation events in this case induced fibrin deposition around the foreign body as an initial response, and at a later stage, an influx of neutrophils, lymphocytes, polyblasts and giant cells happened, thus forming a capsule isolating the foreign body (Koychev & Hubenov, 1994). Most probably, the reaction of the peritoneum was rather stronger and the fistula tract through the abdominal wall has opened on the outer surface, and not in the abdominal cavity.

In the literature, cases of vesicovaginal and vaginoperitoneal fistulas after poor ovariectomy technique or improper suture material are described (Gadelha *et al.*, 2004; Holt *et al.*, 2006). The second category of fistulas are most commonly asymptomatic and are incidental findings during vagino- or urethrographies on other occasions. In our patient, no other post-castration complication were established.

Inadequate operative technique, improper placement of ligatures during ovariectomy and formation of granulomas could result in compression or ligation of ureters and consequently, in hydronephrosis (Mesquita *et al.*, 2015). In our case, although the granuloma was located caudally to the left kidney and close to the ureter, no signs of hydronephrosis were observed.

The indications for partial or total nephrectomy are traumas with rupture of the kidneys (Papazoglou *et al.*, 2011), nephro- or urolithiasis (Gookin *et al.*, 1996), neoplasms of kidneys or pararenal tissues (Bryan *et al.*, 2006), chronic pyelonephritis, severe hydronephrosis or renal cysts (Papazoglou *et al.*, 2011; Paskalev *et al.*, 2012), hypoplasia of ureters, ectopic ureter (Lanz *et al.*, 2000; McLoughlin, 2005). We have performed the total nephrectomy because intraoperatively, the formation was very tightly adhered to the kidney and it was not possible to tell whether it was a neoplasm or not. Partial nephrectomy posed additional risks, and blood parameters indicated a proper kidney function. The macroscopic appearance of the contralateral kidney was good.

Provided that the contralateral kidney is healthy, the total nephrectomy does not alter significantly body physiology and the function of the remaining organ which is preserved, except for a mild compensatory hypertrophy (Latif *et al.*, 2007; Urie *et al.*, 2007; Paskalev *et al.*, 2012).

The analysis of blood until the 4th post-operative month did not show any marked deviation from reference values of blood urea and creatinine. The clinical status of the dog was also very good.

In conclusion, the differential diagnosis during examination of castrated bitches with paralumbar fistulas should consider also granuloma consequently to

nonabsorbable ligature, regardless of the time of castration. In such cases, total nephrectomy is indicated when the affected kidney could not be saved.

REFERENCES

- Adin, C. A., 2011. Complications of ovariectomy and orchietomy in companion animals. *Veterinary Clinics of North America: Small Animal Practice*, **41**, 1023–1039.
- Ball, R. L., S. J. Birchard, L. R. May, W. R. Threlfall & G. S. Young, 2010. Ovarian remnant syndrome in dogs and cats: 21 cases (2000–2007). *Journal of the American Veterinary Medical Association*, **236**, 548–553.
- Blacklock, K. L., P. Langer, Z. Halfacree, D. A. Yool, S. Corr, L. Owen, E. Friend & A. Ekiri, 2016. Canine ovariectomy: A survey of surgeon concerns and surgical complications encountered by newly graduated veterinarians. *Journal of Veterinary Medical Education*, **43**, 184–189.
- Bryan, J., N. Henry, C. J. Turnquist, S. E. Tyler, J. W. Liptak, J. M. Rizzo, S. A. Sfiligoi, G. Steinberg, S. J. Smith & A. N. Jackson, 2006. Primary renal neoplasia of dogs. *Journal of Veterinary Internal Medicine*, **20**, 1155–1160.
- Daigle, J. C., S. Kerwin, C. S. Foil & S. R. Merchant, 2001. Draining tracts and nodules in dogs and cats. *Clinical Techniques in Small Animal Practice*, **16**, 214–218.
- Dorn, A. S. & R. A. Swist, 1977. Complications of canine ovariectomy. *Journal of the American Animal Hospital Association*, **13**, 720–724.
- Dyakov, L., L. Lozanov, A. Angelov & D. Stoykov, 1989. Manual of Veterinary Histopathology. Zemizdat, Sofia.
- Dzhurov, A., E. Alexandrova & M. Alexandrov, 1989. Methods for Histopathological Examinations, Zemizdat, Sofia, pp. 28–34.

- Gadelha, C. R. F., A. P. C. Ribeiro, M. F. Aparício, G. J. Covizzi & W. R. R. Vicente, 2004. Acquired vesicovaginal fistula secondary to ovariohysterectomy in a bitch: A case report. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*, **56**, 183–186.
- Gookin, J. L., E. A. Stone, K. A. Spaulding & C. R. Berry, 1996. Unilateral nephrectomy in dogs with renal disease: 30 cases (1985–1994). *Journal of the American Veterinary Medical Association*, **208**, 2020–2026.
- Holt, P. E. J., M. J. Bohannon & M. J. Day, 2006. Vaginoperitoneal fistula after ovariohysterectomy in three bitches. *Journal of Small Animal Practice*, **47**, 744–746.
- Johnson-Neitman, J. L., R. J. Bahr & K. D. Broaddus, 2006. Fistula formation secondary to a nylon cable band in a dog. *Veterinary Radiology & Ultrasound*, **47**, 355–357.
- Koychev, K. & H. Hubenov, 1994. General Veterinary Surgery. Agropress Publishing House, Sofia, pp. 246–248.
- Krastev, Sv., G. Simeonova, V. Urumova & R. Simeonov, 2008. Vertebral osteomyelitis due to *Candida albicans* in a dog. *Trakia Journal of Sciences*, **6**, 66–72.
- Lanz, O. I. & D. R. Waldron, 2000. Renal and ureteral surgery in dogs. *Clinical Techniques in Small Animal Practice*, **15**, 1–10.
- Latif, S. M. W., M. A. Khan, A. K. Mahmood & H. B. Rashid, 2007. Effect of partial and complete nephrectomy on various blood parameters in dogs. *Journal of Animal and Plant Sciences*, **17**, 1–4.
- McLoughlin, M. A., 2005. The upper urinary tract. In: *BASVA Manual of Canine and Feline Abdominal Surgery*, British Small Animal Veterinary Publications, Gloucester, pp. 242–254.
- Mesquita, L. R., S. C. Rahal, L. M. Matsubara, M. J. Mamprim, C. R. Foschini, L. G. Faria & W. T. Kano, 2015. Bilateral hydronephrosis and hydroureter after ovariohysterectomy using nylon cable tie: A case report. *Veterinarni Medicina*, **60**, 52–56.
- Papazoglou, L. G. & V. Kouti, 2011. Renal surgery in the dog and cat. *Journal of the Hellenic Veterinary Medical Society*, **62**, 249–256.
- Paskalev, M., L. Lazarov & A. Atanasov, 2012. A case of renal cyst in a dog. *Bulgarian Journal of Veterinary Medicine*, **15**, 62–67.
- Pearson, H., 1973. The complications of ovariohysterectomy in the bitch. *Journal of Small Animal Practice*, **14**, 257–266.
- Urie, B. K., D. M. Tillson, C. M. Smith, W. R. Brawner, G. T. Almond, G. T. Beard, D. M. Lenz & C. D. Lothrop, 2007. Evaluation of clinical status, renal function, and hematopoietic variables after unilateral nephrectomy in canine kidney donors. *Journal of the American Veterinary Medical Association*, **230**, 1653–1656.
- Wallace, M. S., 1991. The ovarian remnant syndrome in the bitch and queen. *Veterinary Clinics of North America: Small Animal Practice*, **21**, 501–517.

Paper received 19.10.2016; accepted for publication 06.02.2017

Correspondence:

Mihail Paskalev, DVM, DSc
Department of Veterinary Surgery,
Faculty of Veterinary Medicine,
Student's Campus, Trakia University
6000 Stara Zagora, Bulgaria,
e-mail: paskalev@uni-sz.bg