Clinical Commentary

Tumours of the equine bladder: What makes treatment of these cases so difficult?

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Bladder neoplasia in the horse is a rare but clinically challenging and often fatal cancer. In this issue, Serena et al. (2009) describe a partial cystotomy to treat a squamous cell carcinoma of the bladder wall, the first documented successful removal of a tumour of this nature. Historically, treatment of neoplasia of the urinary bladder in horses, and other domestic animals for that matter, has been limited. How do these cancers typically present? What is it about these particular tumours that makes treatment so difficult? Which treatments have proven to be successful and which have not? The following is an attempt to summarise the major areas of research and advancements in the treatment of equine bladder tumours.

The most common urinary tract neoplasms in equines, especially those in the older age range as that of the mare in Serena et al.’s (2009) case, is squamous cell carcinoma, followed by transitional cell carcinoma (Cornelisse 2003). Other infrequent reports include lymphosarcoma (Sweeney et al. 1991), fibromatous polyp (Fischer et al. 1985), rhabdomyosarcoma (Turnquist et al. 1993) and leiomyosarcoma (Hurcombe et al. 2008). The poor prognosis that accompanies these tumours is in large part due to their tendency to metastasise to other organs. This may occur through direct invasion into the abdominal cavity, via the lymphatic system, or haematogenously in advanced cases (Fischer et al. 1985).

Common clinical presentations of a bladder neoplasm resemble urolithiasis or cystitis. Haematuria, which may include blood clots (Fischer et al. 1985), stranguria and pollakiuria are the most common signs (Traub-Dargatz 1998). The haematuria is thought to result from erosion and damage to the bladder mucosa at the site of the neoplasm. Increased frequency of urination is thought to be the result of cystitis and decreased bladder volume due to the infiltrative mass, although there has been some thought that chronic cystitis may be the primary cause of the neoplasia (Traub-Dargatz 1998). Other signs seen less frequently include weight loss and anorexia. Laboratory tests may show azotaemia and mild anaemia (Traub-Dargatz 1998). Complications can arise due to obstruction by the mass and may include pyelonephritis and ureteral dilatation leading to hydronephrosis (Cornelisse 2003). Differentiation between neoplasia and urinary calculi can be made by a combination of rectal palpation (a bladder stone should be much firmer on palpation), ultrasonography (a bladder stone would be more hyperechoic), endoscopy and biopsy (Traub-Dargatz 1998).

Use of chemotherapeutic drugs in the treatment of equine neoplasia is not common. Reasons for this include the high cost of the drugs due to large body mass, requirement for specialist knowledge and hospitalisation for drug administration, undesirable side effects, poor success rate, and often late diagnosis of neoplasia (Knottenbelt 2006). Nevertheless, there are case reports of treatment of bladder tumours with cytotoxic agents. Fischer et al. (1985) documented infusion of 5-fluorouracil into the urinary bladder of a pregnant mare for 4 consecutive days, followed by 4 more treatments every other day. Initially, haematuria decreased significantly and the mass took on a more fibrous consistency. However, within 2 weeks of the course of chemotherapeutics, the mare became severely anorectic, the mass doubled in size, and the owners elected to subject the animal to euthanasia. The authors postulated that if a urinary tract neoplasm could be diagnosed earlier, intralumenal chemotherapeutic treatment may be successful in limiting tumour growth. Monthly debulking of a squamous cell carcinoma in addition to intracystic administration of 5-fluorouracil has been reported to prolong survival in one mare for an additional 9 months (Cornelisse 2003). Hurcombe et al. (2008) treated leiomyosarcoma in a 2-year-old filly with a combination of doxorubicin, diphenhydramine and dexamethasone sodium phosphate. Less than 2 weeks later, the mucosa appeared less inflamed, but the mass had grown so large that it filled the bladder lumen and the horse was subsequently subjected to euthanasia. In the case of Serena et al. (2009), resection of the tumour was followed by piroxicam...
treatment every other day, potentially for the remainder of the animal's life.

Surgical resection of bladder tumours is complicated by the anatomical location of the organ within the pelvic cavity. The bladder can be as deep as 50–60 cm from the umbilicus and very difficult to expose in its entirety (Ragle 2008). Approaches include pararectal, paramedian and parainguinal (Ragle 2008). The ventral midline approach is similar to that used during a cystotomy for the removal of cystic calculi and requires that the animal be placed in dorsal recumbency. A catheter is required in order to drain the bladder, as well as for inflation with sterile saline at the end of the procedure to ensure proper closure of the bladder wall. Trendelenburg positioning of the surgical table between 15–30º will shift the intestines craniod and inflation of the abdomen with CO2 will allow for better visualisation (Serena and Naranjo 2008). Once the abdominal muscles have been incised and dissected, sustained tension is required to bring the bladder into view. Moistened laparotomy pads can be used to pack off the bowel and isolate the bladder in the surgical field (Lillich et al. 2006). Tumours of the bladder may be difficult or impossible to excise entirely due to their tendency to invade the bladder wall (Cornelisse 2003). Preferred closure of the bladder wall is with 2 layers of synthetic absorbable suture in a Cushing or Lembert pattern (Lillich et al. 2006). Suture should not extend past the mucosa into the lumen of the bladder (Lillich et al. 2006). Closure of the abdomen is routine. A parainguinal approach may be preferable, especially in males, as reflection of the prepuce is not necessary. This technique also may avoid damaging large vessels (Lillich et al. 2006).

Laparoscopy in bladder tumour removal is a somewhat unexplored area, although there has been significant advancement in the use of the laparoscope to remove cystic calculi. This technique has the benefit of avoiding large incisions through abdominal muscles (Ragle 2002). Positioning is similar to the ventral midline approach and 5 instrument portals are created within the medial half of the rectus abdominus muscle so that the caudal epigastric artery and vein are avoided (Ragle 2002). Intracorporeal suturing is a limitation in laparoscopy as this skill is technically difficult, requires much practice, and mistakes may lead to improper closure of the bladder (Ragle 2002).

Autosuturing instruments are available and may be suited for use on the equine bladder (Ragle 2002). Complications from laparoscopy can include haemorrhage from the instrument portals and obstruction of view by excessive abdominal fat from the falciform ligament (Ragle 2008).

To date, tumours of the equine bladder are still challenging tumours that progress rapidly. They are often detected late in progression, are difficult to access and usually do not respond well to treatment. However, early detection coupled with successful surgical excision and simultaneous treatment with cytotoxic agents may increase the survival time of affected horses. It remains to be seen if the success achieved by Serena et al. (2009) can be repeated by others.

References


Continued from page 260