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Perineal approaches and surgery for tumours

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Summary
There are many ways to approach the rectum from the perineum. The rectal approach is suitable for small lesions in the rectum wall itself. The lateral approach is mainly used for lesions to the side of the rectum such as tumours and perineal hernia’s. More advanced approaches include the dorsal approach through which a complete resection of a distal part of the rectum and anastomoses can be performed or a ventral approach, The ventral approach necessitates an osteotomy of the symphysis and allows surgery on the intrapelvic part of the rectum and colon. The rectal pull through is a technique that can be used if a large part of the distal rectum is affected. This technique is associated with major postoperative morbidity caused by the often-occurring faecal incontinence. The large bowel is more complicated to do surgery on. This is mostly caused by the location of the bowel deep in the abdomen, the absence of a protecting omentum in the area and the high number of bacteria present. Also, a slightly different healing pattern, a less developed vascularity and mechanical abrasion may prevent proper healing of the bowel. The abdominal approach is the most common and is used for several procedures including, colostomy, colectomy, colopexy and anastomoses.

Introduction
Perianal tumours are frequently observed in dogs and very uncommon in cats.1 The most common perianal tumours can be divided in perianal gland tumours and anal sac tumours.2 Additionally, many other tumour types have been described in the perianal area. Rectal tumours are also relatively common in dogs and rare in cats.3 Most rectal tumours originate from the rectal mucosa and can be either benign (polyp or adenoma) or malignant (adenocarcinoma). Next to mucosal tumours, other rectal and colonic wall tumours occur infrequently in the distal gastro-intestinal tract.

Perianal gland adenoma
Perianal glands can be found anywhere around the anus, at the base of the tail and surrounding the male genitalia. Other locations of perianal gland tumours have been described occasionally, however. Perianal gland tumours are often benign and occur frequently in male, intact dogs. Female dogs can be affected, however, and Morbus Cushing (Cushing’s disease) should be one of the rule outs if this is the case. Perianal gland tumours are dependent of testosterone and will often regress after castration. Testicular abnormalities, such as interstitial cell tumours, are commonly coinciding with the diagnosis of perianal gland adenoma. Multiple tumours can be present. In less than 5 percent of the cases, perianal gland tumours are malignant, the perianal gland adenocarcinoma. These tumours are hormone-independent and can grow relatively fast. Metastasis have been described, late in the disease process. Changes in genetic make-up of perianal gland tumours, such as p53, MDM2 and GH have been described and may play a role in the pathogenesis. Perianal glands do not exist in the cat.

Anal sac adenocarcinoma
This tumour of the apocrine glands of the anal sac is more commonly described in the female dog, although a recent publication did not find a difference between gender.5 The tumour often affects only one anal gland and has a high metastatic capacity. Metastases can be found in the lumbar lymph nodes, liver and lungs. Because of their location, anal sac (adeno)carcinomas are often diagnosed late in the disease. Anal sac adenocarcinomas have been associated with paraneoplastic syndromes caused by the parathyroid hormone-like substances.6 Recently, 5 dogs with squamous cell carcinoma of the anal sac were described.7

Rectal tumours
Also, rectal tumours are more common in dogs compared to cats. They occur in older animals and consist of adenomas, adenocarcinomas, and leiomyomas.

Clinical signs
Most clinical signs are associated with irritation of the perianal area caused by a mass that may be ulcerated. Perianal gland tumours are often multiple, nonpainful, relatively solid masses that grow slowly. Perianal gland adenocarcinoma may grow faster, is fixed to the deeper layers and often is ulcerated. Anal sac adenocarcinoma often go unnoticed when they are small. Larger specimens will inadvertently give signs comparable to impacted anal glands or in case of paraneoplastic syndrome signs associated with hypercalcemia.8 Dogs with rectal tumours have signs of haematochezia and tenesmus.

Diagnosis
The diagnosis of perianal and rectal tumours is made using fine needle aspiration cytology, ultrasound, CT-imaging or examination of an histologic biopsy. Ultrasound of the lum-
bar lymph nodes and the liver and radiographs or CT of the chest are used to detect metastases. Endoscopy can further confirm the diagnosis in case of rectal tumours.

**Surgical therapy**

**Introduction**

Surgical therapy of tumours in the perianal area consists of resection of the tumour with as wide a margin as you can obtain. The normal 2-3 cm disease free margins often are not obtainable, and marginal resection should thus always be checked for complete removal. If the tumour extents to the surgical cut surface, additional radiation or chemotherapy should be provided. Many approaches have been described and the method varies depending on the size and location of the tumour.

**Surgery for (peri)anal disease**

**Rectal approach**

This approach is suitable for small lesions in the rectal wall up to 7-8 cm proximal to the anus. After the anus is relaxed (the author prefers to use muscle relaxantia or an epidural blockade during this procedure), the anal orifice is kept open using special dilators. The rectal wall surrounding the tumour is everted using stay sutures. The tumour is resected and all layers apposed with interrupted small monofilament absorbable suture material (the author prefers polyglecaprone 4-0).

**Lateral approach**

The lateral approach is used for lesions that are located in the perianal subcutaneous tissues or in the lateral wall of the rectum. Solid knowledge of the anatomy of the area is necessary not to damage vital structures (such as the pudendal artery and nerve). A curved incision is made parallel to the anus and the pelvic diaphragm is exposed by bluntly dissecting the perianal fat and subcutaneous tissues. The caudal rectal nerve and pudendal artery need to be visualised and preferably spared. Tumours in this area should be removed with 1-2 cm margins if possible.

**Dorsal approach**

The dorsal approach can be used if the lesion is not to close to the anus and not to far in the rectum. Most often this approach is used for large lesions that necessitate partial resection of the rectum wall. Rectal resection of a 360 degree lesion with end-to-end anastomosis is possible using this approach. The patient is placed in ventral recumbency. The tail is located and stretched dorsally towards the midline of the animal. A semilunar incision is made from one tuberosity to the other circling the dorsal part of the anus while staying at least 1 cm away from the anal area (depending on the size of the dog).

After incising the skin and the subcutaneous muscles the muscles surrounding the rectum need to be identified. The approach necessitates the transection of the rectococcygeal muscles and partial transection of the levator ani muscles. The rectum can thus be freed from surrounding tissue and the affected area located and approached. Closure of the rectotomy or end-to-end anastomosis is performed using small (4-0) monofilament absorbable suture material. The EEA stapling device has been described for rectal and colonic end-to-en anastomosis, but the cost of equipment often precludes its use.

**Ventral approach**

The ventral approach is performed for tumours located in the pelvic canal, that can not be reached using a dorsal or lateral technique. The patient is placed in dorsal recumbency. The incision is made over the ventral midline (sympysis) of the pubis and the aponeurosis of the muscles overlying this area are incised and elevated. After predrilling holes, the complete pubis is osteotomised and lifted from the area. Leaving one side of the internal obturator muscle will facilitate replacement and possibly healing of the osteotomy sites. Closure of the osteotomy is performed using orthopaedic (cerclage) wire.

**Rectal pull-through**

This procedure is only performed in cases with extensive disease of the caudal rectal area or anus. Because incontinence is a major postoperative complication, communication to the owner will need to be clear. The animal is placed in ventral recumbency. Either the caudal rectal mucosa is spared or removed. During the first technique a 360 degree full-thickness incision is made in the rectal wall and the rectum is dissected free by blunt manipulation. After transection, the submucosa and mucosa of the proximal rectal wall is apposed to the identical layers of the remaining caudal rectal wall.

The advantage of this technique is that the sphincter and caudal rectal part will be spared and continence after surgery is often maintained. The second method removes all caudal rectal tissue, forcing the surgeon to suture proximal rectal (sub) mucosa against perianal skin. Incontinence is much more likely although techniques sparing the external sphincter have been described.

**Abdominal approach**

This approach can be used for tumours that are located in a more proximal part of the rectum and colon. The patient is placed in dorsal recumbency. A routine caudovenal midline celiotomy is performed. The colon is retracted cranially and the lesion is located. A routine enterotomy or enteric resection and end-to-end anastomosis is performed using 4-0 monofilament suture material. The location of the tumour can preclude complete removal and the incision may be extended towards the pelvic canal using the above described technique of the pubic osteotomy. After closure, the omentum will need to be mobilised or the surgeon will have to perform an enteral patch technique to prevent dehiscence of the anastomosis.

**Postoperative management**

The use of antibiotics is indicated because contamination of the area is obvious. Also drainage of the loose connective tissues of the perianal area are suggested in cases with large dead space. Pain should be managed sufficiently. Endoscopic evaluation of the rectum may be indicated in cases where postoperative sticture or recurrence is expected.
## Postoperative complications
Post-operative complications are common and include infection and dehiscence, stenosis, injury to the perineal and pudendal nerves, incontinence and fistula formation.

## Prognosis
The prognosis of benign perianal gland tumours is excellent either after castration or after local resection. The prognosis of malignant perianal gland tumours is guarded. Median survival for dogs with anal sac adenocarcinomas was 544 days and dogs with tumours < 10 cm having a significant better prognosis. Also, dogs with hypercalcemia and visible metastases did significantly worse.3

## References

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