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Endoscopic Endocautery Polypectomy for the Treatment of Duodenal and Gastric Polyps in a Cat

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Endoscopic polypectomy is commonly performed in human medicine, with large-scale studies reported. However, few reports have described its use in veterinary medicine and, specifically, the procedure in the case of duodenal polyps in cats has not been reported. A 7 kg 14-year-old cat presented with recurrent vomiting for several months. Gastroduodenoscopy revealed a pedunculated polyp at the pyloric antrum and another in the duodenum, with its head protruding into the pylorus. Endoscopic polypectomy was performed using an electrosurgical snare with no recurrence of clinical signs after six months. Duodenal polypectomy in cats may be difficult because of space limitation but it can be safe, minimally invasive, and successful, thus avoiding more invasive surgical techniques. Endoscopic polypectomy may be a viable alternative to surgery in cats with gastric and duodenal polyps.

Introduction

Endoscopic polypectomy is commonly performed in human medicine, with large-scale studies reported in humans for both gastric[1] and colonic polyps.[2] However, few reports describe its use in veterinary medicine and, to our knowledge, this has not been described in the case of duodenal polyps in a cat.

Two reports have described transanal endoscopic treatment of benign rectal tumors in dogs[3,4], using an electrode-cutting loop and ball-end electrode for excision. Foy and Bach reported three dogs and one cat with hematochezia and chronic vomiting who underwent endoscopic polypectomy using endocautery without complications.[5]

The purpose of this report is to describe the procedure and instruments used to excise a polyp in an unusual location in a cat, as well as the clinical presentation, treatment protocol and outcome.

Case Report

A 7 kg 14-year-old, castrated male, European common-bred cat presented to the referring veterinarian because of recurrent vomiting for several months, worse in the previous month, weight loss of 0.6 kg and with occasional blood and liquid diarrhea in the last 10 days. He showed a 5/9 body condition score and physical examination was normal. Results of complete blood count showed only a mild anaemia (packed cell volume of 29.8% –reference values30%-45%) and a normal serum biochemical profile, except for slightly increased transaminase values –aspartate aminotransferase, AST 67 U/l (reference values 10-29 U/l); alanine transaminase, (ALT 135 U/l, 20-67 U/l). Abdominal ultrasound showed a thickened stomach wall, mainly in the pyloric and antral region. The animal had been treated by the referring veterinarian with a gastrointestinal diet (Feline Hills i/d prescription diet; Hill's Pet Nutrition España, Madrid, Spain), metronidazole - 20 mg/kg q 12 hr (Metrobactin 250 mg; Lely Pharma, PZ Lelystad, Netherlands), omeprazole - 1 mg/kg q 24 hour (Omeprazol Normon 10 mg; Lab. Normon, Tres Cantos, Madrid, Spain) and prednisolone - 0.8 mg/kg q 12 hour (Prednicorte 5 mg; Lely Pharma, PZ Lelystad, Netherlands) with some short-term symptomatic improvement. A second ultrasound examination after three weeks revealed a pedunculated mass located in the pyloric antrum (Fig 1). A presumptive diagnosis of a benign polyp was made on the basis of the homogeneous echogenic appearance.[6] At this stage, a referral was made to the Teaching Veterinary Hospital of Murcia University, for further diagnostic testing and endoscopic polypectomy, approximately five months after the onset of symptoms.

Consent for polypectomy was obtained from the owner after discussion of the procedure, including risks and complications. Patient preparation for endoscopy included 24 hours fasting (solid food). The animal was examined under general anesthesia, which was induced with propofol 1.4 mg/kg IV (Propovet 20 ml, 10 mg/ml; Abbott Laboratories, Madrid, Spain), and maintained with isoflurane in oxygen 100%. He was then placed in the left lateral position and was shaved along the medial aspect of the thigh, and an adhesive cautery pad (Universal Electrosurgical Pad: Split; 3M Health Care, MN 55144, USA) was placed.

A gastroduodenoscopy was performed with a video endoscope (8.0 × 1500 mm; Video endoscope VET-8015HD, Aohua Veterinary Endoscopy, Songjiang, Shanghai, China). The esophageal mucosa was normal and without food residue and the sphincters appeared normal. There was an approximately 0.6 × 1 cm pedunculated polyp at the pyloric antrum, proximal to the pylorus (Fig 2). A second pedunculated polyp –approximately 0.8 × 0.6 cm- was observed in the first part of the descending duodenum, with its head protruding into the pylorus, but endoscopic maneuverability was limited due to space constraints, thus precluding complete visibility (Fig 3). The polyp appeared to partially occlude the gastric outlet. The rest of the accessible duodenal mucosa was normal except for slight congestion of the most proximal mucosa. No other masses were seen in the area of the visualised duodenum. Prior to polypectomy, representative endoscopic biopsies were obtained from the stomach and duodenum.

Endoscopic polypectomy was performed via direct visualization of the polyps and placement of an electrosurgical snare (Polypectomy snare; Boston Scientific International, 92729 Nanterre Cedex, France) with a 13 mm diameter loop around the entire polyps (Fig 2), with tightening of the snare around the stalk. Prior to electrocautery, the polyps were retracted away from their base into the lumen, tenting the wall to prevent trauma to the adjacent deep layers. A monopolar

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Fig. 1. Abdominal ultrasonography. A polyp is visible in the gastric antrum.

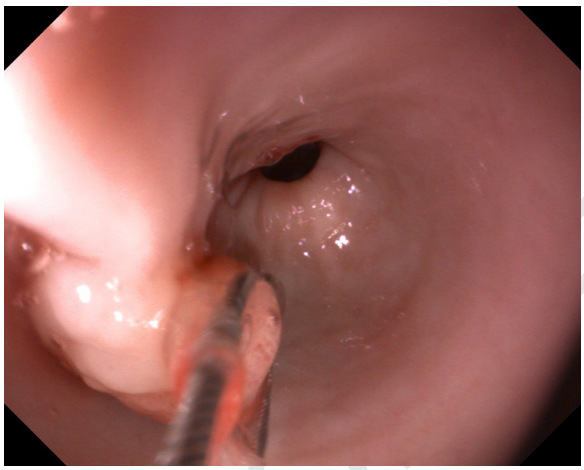

Fig. 2. Endoscopic gastric view. An antral polyp is visible, with the electrosurgical snare around it.

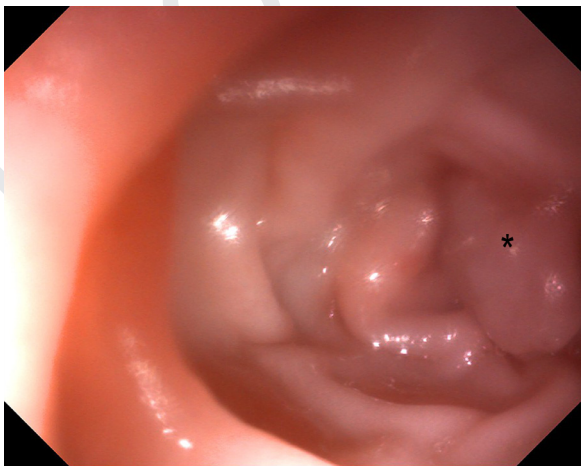

Fig. 3. Duodenal polyp. Endoscopic image showing a polypoid duodenal mass (black asterisk) with its head protruding into the stomach through the pylorus. The blurring is probably due to the smoke generated by the previous gastric polypectomy.

electrosurgical unit (Surgistat Electrosurgical generator; Valleylab, Boulder, CO, USA) was used to deliver electrocautery through the snare, applying current in a blended fashion (i.e. a combination of both coagulation and cutting). Current was applied continuously until the mass was separated from the underlying mucosa. Both polyps were pedunculated, and the electrosurgical snare was passed over each of them. Electrocautery was applied with coagulation at 15 watts (W) and cutting at 20 W. The polypectomy sites (Fig 4) were monitored for several minutes for evidence of haemorrhage and the polyps were successfully separated from the duodenal/gastric wall and retrieved by aspiration. The total procedure time was 40 minutes and the animal was discharged the same day on prednisolone (0.5 mg/kg q 12 h, PO), 10 mg omeprazole q 24h, and tylosin -10 mg/kg q 12 hour (Tilosina 100 Ganadexil; INVESA, Barcelona, Spain), only in case of recurrence of diarrhoea, as well as a gastrointestinal diet, for a total of 10 days.

Histopathology showed mild lymphoplasmacytic gastroduodenitis (I/III) and the removed polyps were classified as adenomatous masses, with no features of dysplasia.

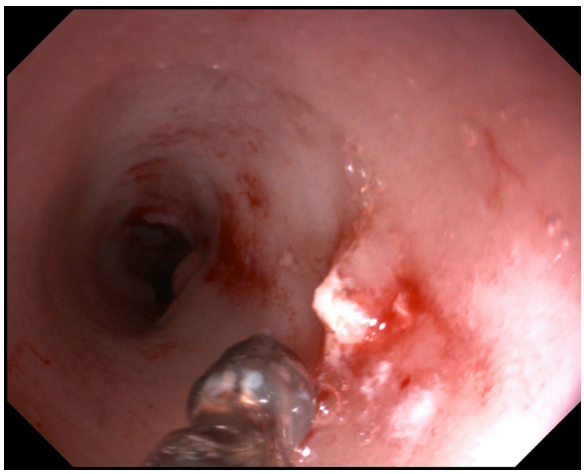

Fig. 4. Endoscopic duodenal view following polypectomy. A biopsy snare was used to excise some of the residual stalk.

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Six months post polypectomy the animal was reported to be clinically normal with no recurrence of clinical signs.

Repeat endoscopy was recommended at 3 and 6 months after the procedure, to assess for additional or recurrent polyp formation or transformation of the site to invasive adenocarcinoma. However, lack of owner compliance because of the advanced age of the animal and financial constraints precluded follow-up.

Discussion

Endoscopic polypectomy is usually used in human medicine, with large-scale studies reported in humans for both gastric[1] and colonic polypectomy.[2] However, very few reports describe the use of this technique in cats[5], and specifically, at this location. A retrospective study of inflammatory colorectal polyps in miniature Dachshunds included 33 dogs, but only eight dogs had endoscopic treatment of their polypoid lesions, several of which had endoscopic polypectomy with argon plasma coagulation.[7] A similar study has not been published in cats.

Polyps are the most common benign masses in the gastrointestinal tract, defined as grossly visible protrusions from the mucosal surface of either neoplastic or non-neoplastic cells.[8] The miniature Dachshund was over-represented in a population of 33 dogs found to have colorectal polyps, with a median age of presentation of 10 years.[7] Besides, an increased prevalence for colorectal polyps is suggested in Poodles, Airedale Terriers, German Shepherd Dogs, and Collies.[9] The most common types are adenomatous, inflammatory, carcinoma or adenocarcinoma.[9] Polyps do not appear to be nearly as common in dogs or cats as they are in humans.[5,10]

Polyps are of unknown aetiology, and it is thought that the most frequent colorectal ones are typically a result of irritation, which may occur from inflammatory bowel disease (IBD), infections, parasites, or chronic diarrhoea.[11] Regarding the risk factors for the development of gastric polyps in humans, a recent study reported that age and an unhealthy diet can affect the occurrence of gastric polyps, as well as risk factors such as smoking, alcohol, proton pump inhibitors (PPI) and nonsteroidal anti-inflammatory drug [NSAIDs] history, gastritis, and gastrin levels together with gastrointestinal symptoms.[12] IBD creates some formations in the gastrointestinal tract during its healing-regeneration cycle, which have polypoid morphology.[13] In our case, the PPI omeprazole was used for several weeks, and histology showed only a slight level of lymphoplasmacytic gastroduodenitis (IBD). It could have been normal for this cat, as resolution was obtained by a short course of steroids, and polypectomy.

The ultrasonographic findings were important to allow diagnosis the gastric polyp although the duodenal one was not identified. Pyloroduodenal polyps may show only subtle ultrasonographic changes that can easily be mistaken for ingested material.[6] However, contrast radiography can be used for a more accurate diagnosis of duodenal polyps in cats.[14]

Gastroduodenoscopy was carried out because clinical signs and imaging findings suggested disease involving the pyloric region of the stomach. In human medicine, endoscopy is considered the mainstay of the diagnosis and treatment of gastrointestinal polyps, as it offers a more sensitive means of screening and diagnosing tumors.[15] Biopsies are recommended as gold-standard for a more definitive diagnosis, which aids in determining prognosis and evaluating treatment options. Because of the higher morbidity rate associated with more invasive surgeries, the trend among human gastroenterologists is towards the use of therapeutic endoscopy to perform resection whenever possible.[15] The term polypectomy is used when referring to removal of lesions measuring <2 cm in diameter with an electrosurgical snare alone.[8] There may be a potential significant risk of perforation with the endoscopic procedure. In fact, transanal endoscopic treatment of benign rectal tumors in dogs resulted in death in five dogs (typically secondary to rectal perforation), was curative in five, and palliative in three.[5] Besides, perforation is a rare complication with pedunculated polyps (in contrast to sessile polyps), and it is reported in only 0.08 % of 277.434 human colonoscopies.[16]

To our knowledge, this is the first description of duodenal polypectomy in cats. It involves a difficult endoscopic procedure, as there exists a limited space for manoeuvreability of the endoscope and snare. We used an 8 mm diameter endoscope for a 7 kg weight cat, but if available, a thinner endoscope, i.e. a paediatric one, would be advisable. A polypectomy is typically performed with the aid of an endoscopic snare that is manually closed to entrap the base of the tissue. With monopolar electrocautery that produces simultaneous cutting and cauterization, the polyp can be resected at the base. Snare polypectomy is performed with a blended coagulation. The purpose of combining electrocautery with the snare polypectomy is to provide additional power when excising the tissue, which provides haemostasis.[17] In humans, the recommended power ranges from 15 to 70 W[17]. For one dog, 15 to 20 W was effective[8] and for one cat, intensities ranging from 20 to 30 W coagulation and 20 to 25 W cutting were also effective.[5] As described in this case, electrocautery with coagulation at 15 watts (W) and cutting at 20 W was successful.

We report successful endoscopic polypectomy of two polyps –one in the stomach and one in duodenum- in a cat. Neither immediate nor delayed haemorrhage was observed, perhaps due to the small stalk size. However, hemoclips and epinephrine injection needles should be available for potential bleeding during the procedure. The two resected polyps were extracted separately by means of aspiration. This method seems easier than the use of grasping forceps or snare.

It seems highly probable that the chronic vomiting observed in the cat was induced by the duodenal polyp entering the stomach, as it may have produced obstruction to some extent or slow transit of the gastric output flow, as described in cats and dogs.[14,18,19] No complications were reported after the procedure, and a 6-month follow-up revealed no recurrence of the clinical signs for which the animal was initially referred.

Although surgical treatment has been successfully described in cats[14], a minimally invasive treatment by endoscopy was chosen for this case because it was the preferred option for the owner. A few facilities around the world are performing polypectomy procedures, but this is not yet considered the standard of care in the veterinary field.[5,8]

In dogs, argon plasma coagulation (APC- device used for noncontact thermal coagulation of tissue which can be performed under endoscopy) has also been used for treatment of gastric polyps by means of endoscopic polypectomy, in order to cauterize the lesions; it may be useful for mixtures of sessile and pedunculated polyps.[19] Furthermore, argon plasma coagulation was also performed for treatment of colorectal polyps in a miniature Dachshund.[20] Resections were performed by polypectomy, but APC was carried out to cauterize the polyp remnants as it may be effective for hemostasis.[20] Polypectomy is difficult for complete resection of sessile polyps because the resection site for polypectomy is the stalk of the mass. In contrast, APC can be used for cauterization from the surface of polyps.[20]

In humans, a repeat endoscopy is recommended in those patients who undergo polypectomy[21] but this was not possible in our case. However, in veterinary medicine, if complete excision of a benign mass is accomplished, the prognosis for full recovery is generally good to excellent.[8] If the benign mass is incompletely excised, recurrence and malignant transformation are possible and therefore, monitoring is important.[8]

In conclusion, endoscopic polypectomy using endocautery in the pyloric antral and descending duodenal locations of a cat is described in this report with no recurrence of clinical signs after six months. Duodenal polypectomy in cats may imply some difficulties because of limited space for manoeuvring but it can be safe, minimally invasive, and successful, avoiding more invasive surgical techniques. Thus, endoscopic polypectomy may be a viable alternative to surgery in cats with gastric and duodenal polyps. To make further

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recommendations and better describe the risks and benefits of this procedure, large-scale studies should be performed, also to determine long-term follow-up in cats.

Video 1: Endoscopic video showing the gastric polyp with the snare encircling the stalk and application of gentle traction pulling the snare away from the normal mucosa, after completion of endocautery.

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Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.tcam.2021.100537.

References

1. Gencosmanoglu R, Sen-Oran E, Kurtkaya-Yapicier O, et al. Gastric polypoid lesions: analysis of 150 endoscopic polypectomy specimens from 91 patients. *World J Gastroenterol* **9:**2236–2239, 2003
2. Citarda F, Tomaselli G, Capocaccia R, et al. Efficacy in standard clinical practice of colonoscopic polypectomy in reducing colorectal cáncer incidence. *Gut* **48:**812–815, 2001
3. Holt PE, Durdey P. Transanal endoscopic treatment of benign canine rectal tumors: preliminary results in six cases (1992-1996). *J Small Anim Pract* **40:**423–427, 1999
4. Holt PE. Evaluation of transanal endoscopic treatment of benign canine rectal neoplasia. *J Small Anim Pract* **48:**17–25, 2007
5. Foy DS, Bach JF. Endoscopic polypectomy using endocautery in three dogs and one cat. *J Am Anim Hosp Assoc* **46:**168–173, 2010
6. Daure E, Jania R, Jennings S, d'Anjou MA, Penninck D. Ultrasonographic and clinicopathological features of pyloroduodenal adenomatous polyps in cats. *J Feline Med Surg* **19:**141–145, 2017
7. Ohmi A, Tsukamoto A, Ohno K, et al. A retrospective study of inflammatory colorectal polyps in miniature Dachshunds. *J Vet Med Sci* **74:**59–64, 2012
8. Coleman KA, Berent AC, Weisse CW. Endoscopic mucosal resection and snare polypectomy for treatment of a colorectal polypoid adenoma in a dog. *JAVMA* **244:**1435–1440, 2014
9. Patnaik AK, Hurvitz AI, Johnson GE. Canine gastrointestinal neoplasms. *Vet Pathol* **14:**547–555, 1977
10. Engle GG, Brodey RS. A retrospective study of 395 feline neoplasms. *J Am Anim Hosp Assoc* **5:**21–31, 1969
11. Church EM, Mehlhaff CJ, Patnaik AK. Colorectal adenocarcinoma in dogs: 78 cases (1973-1984). *J Am Vet Med Assoc* **191:**727–730, 1987
12. Cao W, Hou G, Zhang X, et al. Potential risk factors related to the development of gastric polyps. *Immunopharmacol Immunotoxicol* **4:**338–343, 2018
13. Martínez González J, Esteban P. Small intestine polyps non-associated with polyposis syndromes editor.. In: Pérez-Cuadrado E, editor. *Enteroscopy*, 1st ed, Sevilla: Sulime SL; 2014. p. 214–220
14. MacDonald JM, Mullen HS, Moroff SD. Adenomatous polyps of the duodenum in cats: 18 cases (1985-1990). *J Am Vet Med Assoc* **202:**647–651, 1993
15. Robertson DJ. Colonoscopy for colorectal cancer prevention: is it fulfilling the promise? *Gastrointest Endosc* **71:**118–120, 2010
16. Arora G, Mannalithara A, Singh G, et al. Risk of perforation from a colonoscopy in adults: a large population-based study. *Gastrointest Endosc* **69:**654–664, 2009
17. Morris ML, Tucker RD, Baron TH, et al. Electrosurgery in gastrointestinal endoscopy: principles to practice. *Am J Gastroenterol* **104:**1563–1574, 2009
18. Tappin SW, Brissot H. Endoscopic excision of a gastric polyp causing intermittent pyloric obstruction in a dog. *Vet Rec* **165:**379–380, 2009
19. Teshima T, Matsumoto H, Michishita M, et al. Multiple inflammatory gastric polyps treated by endoscopic polypectomy with argon plasma coagulation in a dog. *J Small Anim Pract* **54:**265–268, 2013
20. Tsukamoto A, Ohno K, Mitsuhiro I, et al. A case of canine multiple inflammatory colorectal polyps treated by endoscopic polypectomy and argon plasma coagulation. *J Vet Med Sci* **74:**503–506, 2012
21. Bond JH. Polyp guideline: diagnosis, treatment, and surveillance for patients with nonfamilial colorectal polyps. The practice parameters committee of the american College of Gastroenterology. *Ann Intern Med* **119:**836–843, 1993

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