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## Gastric outflow obstruction due to pyloric gland adenomas and its surgical management in a mongrel pup

**J Radhakrishna Rao, MS Didugu and K Kishore**

### Abstract

A 4.5 month old male mongrel pup weighing 7.5 kg was referred to Veterinary Clinical Complex, Bhoiguda, College of Veterinary Science, P.V. Narsimha Rao Telangana Veterinary University, Hyderabad with a history of loss of activity and regurgitation/emesis episodes within 30 minutes to 3 hours post-feeding since 2 months. There was anterior abdominal distension and tucked up posterior abdomen observed. The survey and barium radiographs revealed dilated stomach, thickened pyloric area and suggested delayed gastric emptying. Exploratory laparotomy confirmed presence of obstructing masses above the pyloric sphincter. Pylorotomy was performed and three polypoid lesions obstructing the gastric outflow were excised. The pup was placed on antibiotic therapy for a week, antacid and supportive therapy for a month. Normal feeding was restored after a week and the complaint of continuous regurgitative and emetic episodes were completely resolved. The histopathology report confirmed that the growths were of pyloric gland adenomas. The pup recovered uneventfully.

**Keywords:** Gastric outflow obstruction, pyloric gland adenomas, mongrel pup

### Introduction

The pyloric portion of the stomach is made up of the pyloric antrum, which starts at the angular notch, the short and narrow pyloric canal, the pylorus, which encircles the duodenal entrance and the pyloric sphincter [1].

Gastric outflow obstruction is an uncommon finding in dogs and may result from a physical obstruction or defective propulsive activity [2]. Gastric tumours, gastric foreign bodies, gastric granulomas, intussusception, hypertrophic gastritis and hyperplastic polyps of the pyloric region are physical obstructions to the pyloric outflow [3, 4]. Among the gastric tumours, adenocarcinoma of the stomach epithelium has been more frequently reported in dogs while benign gastric neoplasms are very rare [5, 6]. The most prevalent clinical signs of gastric outflow obstruction are persistent intermittent vomitings, discomfort and distention of the anterior abdomen occurring mostly after a meal [7].

When presented, gastric outflow obstruction is usually treated medically. If the cause is due to physical obstruction, there is no resolution with medical treatment and surgical approach is opted. The main purpose of surgical approach is to remove the pyloric obstruction and restore normal gastric emptying [8]. Depending on the severity of the reported lesions, surgical techniques such as mucosal excision, various forms of pyloroplasty and gastroduodenostomy are being used [4, 9-12].

This paper presents a case of gastric outflow obstruction due to three pyloric adenomas in a mongrel pup and its successful surgical management by their resection through pylorotomy.

### Materials and Methods

A 4.5 month old male mongrel pup weighing 7.5 kg was referred to Veterinary Clinical Complex, Bhoiguda, College of Veterinary Science, P.V. Narsimha Rao Telangana Veterinary University, Hyderabad from District Veterinary Hospital (DVH), Khammam with a history of loss of activity and regurgitation/emesis episodes within 30 minutes to 3 hours post-feeding since 2 months. There was anterior abdominal distension and tucked up posterior abdomen in the dog. On clinical examination, a dilated fluid filled sac like structure was palpable in the anterior abdomen. The dog was presented once in every 2-3 days to the DVH, Khammam, for intravenous fluids administration (normal saline and ringer's lactate) as the animal was unable to take oral food, as nutritional source.

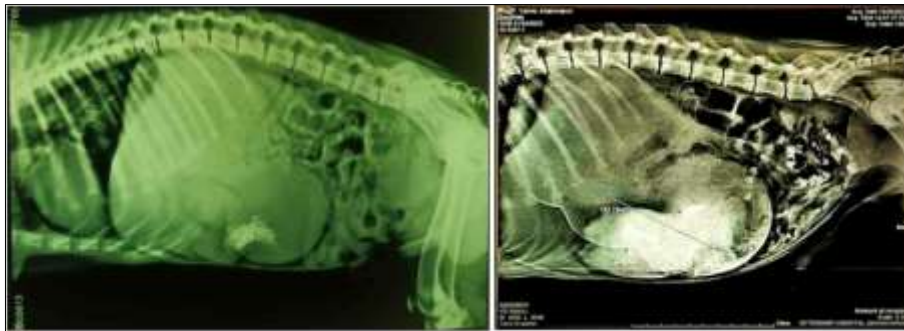
The blood parameters were within normal range. The faecal examination was negative for parasitic and protozoal eggs/organisms. The survey radiographs showed dilated stomach with increased opacity at the pyloric area. Contrast radiography with barium swallow revealed delayed gastric emptying with outflow obstruction at the pyloric region (Fig.1). Exploratory laparotomy was performed to further diagnose and correct the condition.

The anterior ventral abdomen of dog was prepared aseptically under sedation with xylazine @ 1 mg/kg body weight (BW) and atropine sulphate @ 0.04 mg/kg BW administered intramuscularly as pre-anaesthetics. Ketamine was given @ 10 mg/kg intramuscularly after which intravenous line was established and diazepam @ 0.5 mg/kg BW was given intravenously. A combination of xylazine and ketamine @ 0.5 mg/kg BW and 2.5 mg/kg BW respectively was given intravenously as a top-up for maintenance of anaesthesia.

The animal was placed in dorsal recumbency (Fig. 2) and a midline skin incision was made at the anterior abdomen. The linea alba was palpated and incised to enter the abdominal cavity (Fig. 3). The stomach was exteriorized. Soft tissue swellings were palpable in the stomach just above the pyloric sphincter while the other parts of gastro-intestinal tract were normal when palpated. The abdomen was packed with moist laparotomy pads to prevent accidental spillage of stomach contents (Fig. 4). Stay sutures were placed on the stomach for minimizing handling of the gastric tissue. The stomach was incised along the greater curvature of the pyloric region at the least vascular area. There were three rounded, smooth, polypoid lesions present just above the pyloric sphincter (Fig. 5) which were causing mechanical obstruction to the gastric outflow. The masses were excised and the gastric mucosal

defect after excision of each mass was sutured separately with synthetic absorbable suture (polyglactin 910 of 2-0 size) (Fig. 6). Once the masses were removed there was no longer any obstruction at the pylorus. The pyloric incision was closed with cushing followed by lembert suture patterns with polyglactin 910 suture material of 2-0 size (Fig. 8). The stomach was made free from blood clots with normal saline. The incision on linea alba was closed with simple continuous suture pattern with chromic catgut 1-0 and a few intermittent simple interrupted sutures were applied to strengthen the abdominal suture. The subcuticular suture was done in a continuous manner with chromic catgut 1-0 and the skin was closed with synthetic polyamide 1-0 with horizontal mattress suture pattern (Fig. 9). The excised polyps were sent for histopathological evaluation (Fig. 7). The animal was placed on ceftriaxone sodium @ 25 mg/kg BW for 7 days, meloxicam @ 0.2 mg/kg BW and chlorphenaramine maleate @ 0.5 mg/kg BW along with ondansetron @ 1 mg/kg BW were given intramuscularly for 3 days post-operatively. Antiseptic dressing of the surgical wound was done for 10 days post-surgery.

Omeprazole and domperidone combination tablets were given daily morning and sucralfate syrup was administered thrice a day @ 5 ml/dose, on empty stomach daily for one-month post-surgery. Folic acid and cyanacobalamine containing oral powder, given twice daily and injectable B-complex was administered once daily intramuscularly for one-month post-surgery. The sutures were removed on 10<sup>th</sup> post-operative day (Fig. 10). The histopathology result revealed that the resected tissue was pyloric gland adenoma (Fig. 11). There were no emesis/regurgitation episodes after a week of post-surgery and the animal was active with good appetite.



**Fig 1:** Plain and contrast radiographs showing dilatation of stomach with outflow obstruction at the pyloric region



**Fig 2:** Animal in dorsal recumbency after aseptic preparation of the surgical site



**Fig 3:** Skin and linea alba incision at the anterior abdomen

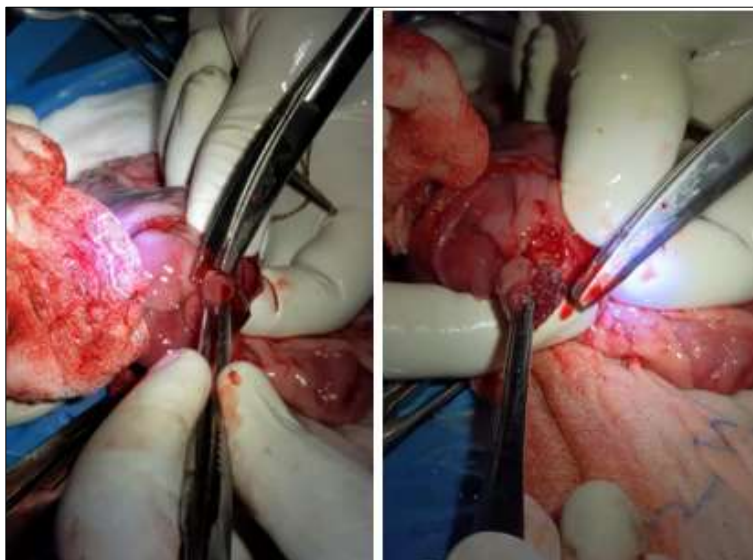


**Fig 4:** Exteriorized stomach and packing of the abdomen with moist laparotomy pads

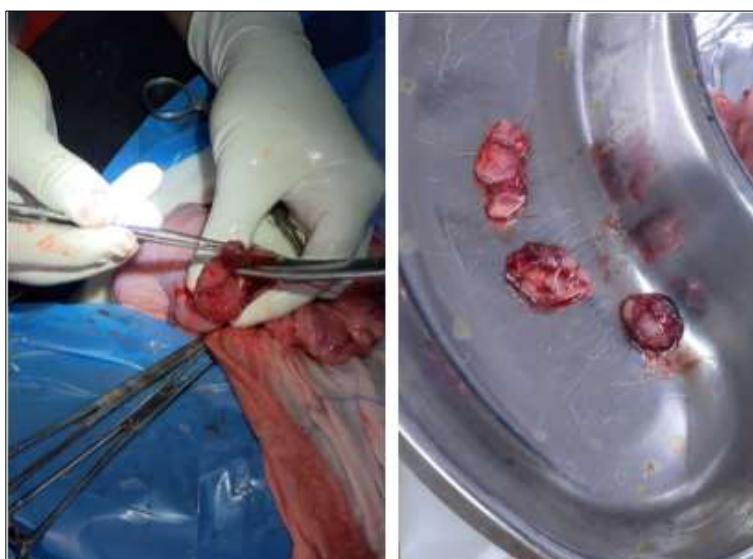


**Fig 5:** Presence of three polyps in just above the pyloric sphincter region





**Fig 6:** Excision of polyps



**Fig 7:** The excised polyps



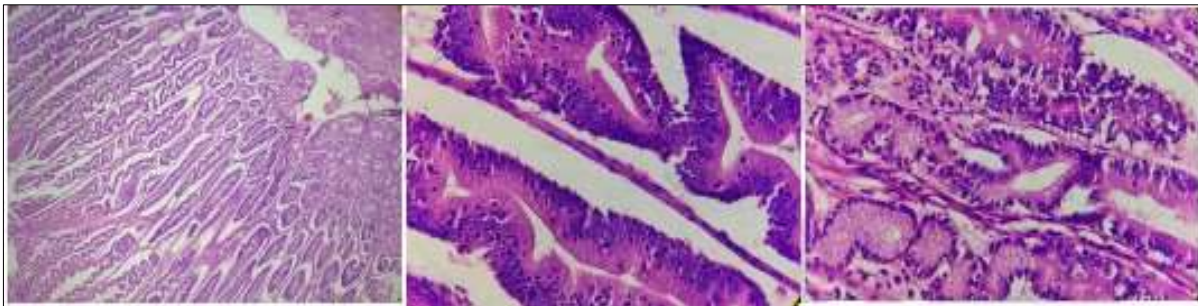
**Fig 8:** Closure of pyloric incision



**Fig 9:** Completion of skin suture



**Fig 10:** Incision site on the 10<sup>th</sup> post-operative day after suture removal



**Fig 11:** Histopathological examination revealed proliferation of tubular glandular structures exhibiting cuboidal to columnar epithelium with eosinophilic cytoplasm and round nucleus. Multifocal dysplastic areas characterized by irregularly arranged tubules with architectural distortion, elongated and crowded nuclei and loss of polarity were also noticed adjacent to the non-dysplastic areas

## Results and Discussion

The emesis and regurgitation post food intake might be due to delayed gastric emptying which led to retention of food and vomiting<sup>13</sup>. Anterior distension of the abdomen was due to the dilated stomach while the tucked-up condition of the caudal abdomen might be due to the abdominal discomfort<sup>14, 15</sup>. In the present case, the emesis 30 minutes to 3 hours following food intake, anterior distension of the abdomen and tucked-up condition of the caudal abdomen were suggestive of gastric outflow obstruction<sup>13</sup>.

There were no consistent laboratory abnormalities found. The distension of the stomach and soft tissue swelling at the pylorus in plain radiographs, delayed gastric emptying of contrast medium in contrast radiographs showed the presence of pyloric outflow obstruction. For confirmatory diagnosis and correction of the condition, exploratory laparotomy, pylorotomy were performed and the resected masses were sent for histopathological evaluation. Based on the histopathological findings of the resected tissue samples, a final diagnosis was made as pyloric gland adenoma.

In the present case, the gastric outflow obstruction was due to three pyloric gland adenomas just above the pyloric sphincter. The excision of the three adenomas on the pyloric mucosa facilitated gastric emptying and reduced the intermittent regurgitative and emetic episodes. The pup recovered completely after the surgery and supportive therapy helped the early recovery of the pup from the disease.

The gastric outflow obstruction by adenomas is a rare condition in dogs particularly in young pups<sup>16</sup>.

## Conclusions

The gastric outflow obstruction by pyloric gland adenomas in pups is a rare condition. Early diagnosis and surgical resection of the pyloric adenomas causing gastric outflow obstruction resulted in successful recovery of the young mongrel dog.

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## References

1. Evans HE. The Digestive Apparatus and Abdomen. In: Miller, M. E., Evans, H. E. Miller's anatomy of the dog. Saunders, Philadelphia; c1993. p. 385-462.
2. Pazzi P, Hartman MJ, Schoeman JP. Congenital pyloric mucosal fold resulting in an antral valve outflow obstruction in a bull terrier. *Journal of Small Animal Practice*. 2013 Mar;54(3):160-163.
3. Jang H, Lee SW, Jang M, Yun S, Kwon YS, Park JK, *et al*. Hypertrophic pyloric gastropathy with *Helicobacter* spp. in a dog. *Korean Journal of Veterinary Research*. 2021 Mar;31, 61(1).
4. Happé RP, Gaag IV, Wolvekamp WT. Pyloric stenosis

- caused by hypertrophic gastritis in three dogs. *Journal of Small Animal Practice*. 1981 Jan;22(1):7-17.
5. Jubb KVF, Kennedy PC. *Pathology of Domestic Animals*, 2, Academic Press; New York and London; c1963. p. 74.
  6. Patnaik AK, Hurvitz AI, Johnson GF. Canine gastric adenocarcinoma. *Veterinary Pathology*. 1978 Sep;15(5):600-607.
  7. Biller DS, Partington BP, Miyabayashi T, Leveille R. Ultrasonographic appearance of chronic hypertrophic pyloric gastropathy in the dog. *Veterinary Radiology and Ultrasound*. 1994 Jan;35(1):30-33.
  8. Leib MS, Saunders GK, Moon ML, Mann MA, Martin RA, Matz ME, *et al*. Endoscopic diagnosis of chronic hypertrophic pyloric gastropathy in dogs. *Journal of Veterinary Internal Medicine*. 1993 Nov;7(6):335-341.
  9. Walter MC, Goldschmidt MH, Stone EA, Dougherty JF, Matthiesen DT. Chronic hypertrophic pyloric gastropathy as a cause of pyloric obstruction in the dog. *Journal of the American Veterinary Medical Association*. 1985 Jan 1;186(2):157-161.
  10. Matthiesen DT, Walter MC. Surgical treatment of chronic hypertrophic pyloric gastropathy in 45 dogs. *Journal of the American Animal Hospital Association*. 1986;22(1):241-247.
  11. Sikes RI, Birchard S, Patnaik A, Bradley R. Chronic hypertrophic pyloric gastropathy: A review of 16 cases. *Journal of the American Animal Hospital Association*. 1986 Jan 1;22(1):99-104.
  12. Walter MC, Matthiesen DT, Stone EA. Pylorotomy and gastroduodenostomy in the dog: technique and clinical results in 28 cases. *Journal of the American Veterinary Medical Association*. 1985 Nov 1;187(9):909-914.
  13. Herdt TH. Gastrointestinal physiology and metabolism. In: Cunningham, J. G., Klein, B. G. *Textbook of Veterinary Physiology*. Saunders, an imprint of Elsevier Inc, St. Louis, MO. c2007. p. 299-407.
  14. Washabau RJ. Gastrointestinal motility disorders and gastrointestinal prokinetic therapy. *Veterinary Clinics of North America - Small Animal Practice*. 2003;33:1007-1028
  15. Simpson KW. Diseases of the stomach. In: Ettinger, S. J., Feldman, E. C. *Textbook of Veterinary Internal Medicine*. Elsevier Saunders, St. Louis, Mo; c2010. p. 1504-1526.
  16. Conroy JD. Multiple gastric adenomatous polyps in a dog. *Journal of Comparative Pathology*. 1969 Oct 1;79(4):465-467.