JEJUNOSTOMY TUBES: THROUGH GASTROSTOMY OR NASAL
Ryan P. Cavanaugh, DVM, DACVS-SA
VCA Alameda East Veterinary Hospital – Denver, CO

The benefits of enteral feeding in critically ill animals have been clearly established and include preservation of the mucosal integrity of the gut, reduction in rates of sepsis and augmentation of the host immune defense mechanisms. A multitude of tube types and techniques for tube insertion have been reported but fundamentally speaking, the decision for the type of enteral feeding required comes down to four options: Gastric, transpyloric, gastric combined with transpyloric and intestinal. Precise clinical algorithms for ideal tube selection in any given patient are not established and therefore it is essential that the clinician carefully anticipate both the short and long-term nutritional needs of the patient prior to tube placement. Variables to consider include the following: Anticipated duration of feeding, patient tolerance of the tube, physiologic disturbances of primary disease, surgical vs. non-surgical placement, owner capabilities, cost and likelihood of gastroparesis.

Gastric feeding via gastrostomy (G) tubes and intestinal feeding via jejunostomy (J) tubes have long been the mainstay for providing enteral nutrition to animals. Minimally invasive techniques for both G and J tube placement have been described, however, J tube placement generally requires some form of an open abdominal procedure. Complication rates associated with J tube feeding have been reported and range from 15.6% to 43.3%. Although the most common complications are mild and generally related to inflammation around the tube stoma or migration of the tube within the bowel, fatal complications associated with premature dislodgement resulting in septic peritonitis have been reported. On the contrary, a distinct benefit of enterostomy tube feeding alone is that a large percentage of critically ill animals develop gastroparesis, which would preclude early feeding through a G tube. In critically ill people receiving gastric feedings, a significantly higher rate of aspiration events (46%) has been reported compared to people receiving post-gastric feeding (6%). In order to maximize the benefit of each feeding tube type while simultaneously reducing the complications, a combined gastrojejunostomy (GJ) tube was developed. A GJ tube is one in which a smaller bore tube (J tube) is fed through the lumen of a routinely placed G tube and is subsequently advanced into the small intestine. The cap on the end of the J tube is manufactured such that it will anchor into the end of the G tube, as well as, allow for simultaneous access to both the lumen of the G and J tube (Figure 1).
Figure 1: Image of a GJ tube. The J tube has been fed through the lumen of the G tube and can be seen exiting the mushroom end-piece of the tube (black arrow). Once the J tube has been fed into the jejunum, the top of the tube containing a specialized dual feeding/suction port is securely docked into the top of the G tube (white arrow).

GJ tube usage in humans has been employed since the early 1990’s and the technology has been widely evaluated in the peer-reviewed literature. Indications for GJ tube placement include conditions causing gastric atony, gastric outflow obstruction or gastroesophageal reflux and for the postoperative management of people who have
undergone biliary diversion procedures or resection of large intra-abdominal malignancies. The main benefit of GJ tubes includes the establishment of dual lumen access (i.e. access to the small intestine and stomach) without the need for an enterotomy. Since healing of gastric tube stomas are superior to intestinal tube stomas, the avoidance of an enterotomy can help eliminate the potential for catastrophic complications associated with premature tube dislodgement. In one study comparing surgically placed GJ tubes to J tubes in people, peritonitis from premature dislodgment occurred in 7.6% (7/92) of J tube placements with zero (0/52) cases of dislodgment in the GJ tube group.5 With dual lumen access, intestinal feeding can be initiated immediately through the J tube component of the tube. The G tube component can then simultaneously be used to suction off/quantify gastric residuals, thus minimizing potential for regurgitation/aspiration and accelerating the time to resolution of gastroparesis. Once gastric residual volume has diminished, staged intestinal to gastric feeding can be performed. Gastric access is still maintained once the J tube is removed, should intermittent bouts of anorexia occur or to use for medication administration.

Techniques for usage of GJ tubes in dogs and cats have been described. Non-surgical, percutaneous placement via endoscopic assistance has been reported in a population of 12 healthy dogs and five healthy cats. In this study, successful non-surgical GJ tube placement was achieved in all dogs/cats and complications associated with placement and management of the tubes were infrequent and minor.6 A prospective study evaluating a population of 26 clinically ill dogs receiving surgically placed GJ tubes was conducted to assess complication rates associated with tube placement and usage.7 In this study, complications were divided into mechanical tube related or tube stoma related.

The mechanical complications observed were kinking (2/26), coiling (7/26), knotting (0/26) and migration (4/26), however, no mechanical complication resulted in the need for a revision surgery.7 Additionally, no variables were identified that predisposed to a mechanical complication, however, J tube placement distance within the small intestine approached significance and in people, placement distance has been shown to be statistically correlated with likelihood of tube coiling and migration. Therefore, when placing GJ tubes, it is preferred that placement distance be well past the duodenocolic ligament into the mid-portion of the jejunum. The tube stoma related complications in the aforementioned study were 77% (20/26), however, all complications were considered minor and self-limiting.7 The most common indications for GJ tube placement were for septic peritonitis due to intestinal perforations, extrahepatic biliary surgery and for managing pancreatic disease. Gastric residual quantification was performed in all dogs for the first 72 hours postoperatively with mean volumes of 12.0ml/kg/day (0-24 hrs), 6.5ml/kg/day (24-48 hrs) and 4.3ml/kg/day (48-72 hrs), thus further solidifying the high incidence of gastroparesis and the benefit of having gastric and intestinal access.

When gastric access/feeding is not required or contraindicated, novel, non-surgical, approaches to achieving transpyloric feeding have been described. An initial report described a fluoroscopically guided nasojejunal (NJ) feeding tube placement technique in 27, non-anesthetized, clinically ill dogs using an end-weighted dual port tube.8 Successful transpyloric tube placement was achieved in 74% of cases but in the cases where intestinal access was achieved, 26% (7/27) of the tubes were unable to be
advanced beyond the level of the cranial dudodenal flexure (duodenocolic ligament). Of these 7 cases, 6 dogs had premature migration of the tube into the stomach, further reinforcing the findings in previous studies suggesting that mechanical complications are minimized with advancement of the tube into the jejunum.8

A pilot study evaluating endoscopically assisted NJ tube placement in a population of three healthy research dogs has also been conducted.9 This study demonstrated that endoscopy could be used to facilitate tube passage into the jejunum, as the technique was successful in each dog. Procedural times were relatively rapid (median 30 minutes) and complications were minimal, however, tube placement required specialized equipment and the need for a highly skilled endoscopist.9 Additionally, this technique has not been reported in clinically ill dogs and since pancreatitis (causing corrugation of and loss of duodenal pliability) is likely the most common indication for this type of tube placement, a larger scale study evaluating sick animals would be helpful in understanding the value of this technique in the clinical setting.

Recently, a variation of the previously reported technique using fluoroscopic guidance for NJ tube placement has been described.10 In this retrospective study evaluating 26 dogs with clinical contraindications (or intolerances) to gastric feeding, transpyloric tube passage was achieved in 92.3% (24/26) of dogs and NJ tubes were successfully completed in 78% (18/23) of dogs. Modifications to the previously reported technique included the following: Dogs were anesthetized and a hydrophilic guide wire and rigid/angled access catheter (Berenstein) were used to facilitate transpyloric passage for NJ tube insertion. Premature oral migration of the tube was documented in 40% (2/5) of tubes that were incompletely placed into the jejunum and in 27% (3/11) of completely placed NJ tubes.10 Aside from these typical premature tube migration issues, complications associated with the procedure were limited and overall, procedure placement time (median 40 minutes) was comparable to other techniques. Disadvantages of the technique included the initial technical proficiency required to master the technique and the necessity of fluoroscopic usage requiring heavy overhead costs and exposure to higher levels of radiation.

Over the past 20 years, feeding tube technologies in human and veterinary medicine have improved tremendously. Documented tube safety and efficacy studies have solidified the utility of this therapeutic modality in our profession. Regardless of the underlying pathology or clinical status of the patient, solutions for animals requiring enteral nutrition are abound and excuses for denying or delaying supplemental nutrition are unjustifiable. A coordinated, multidisciplinary, team approach is often the best way to ensure that all of the nutritional needs of the patient are met.

References


