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HANDLING THE POST-OPERATIVE GASTROINTESTINAL PATIENT

Gastrointestinal (GI) surgery is performed for a multitude of reasons in cats and dogs: enterotomy or gastrotomy following foreign material ingestion, gastric dilatation and volvulus (GDV), mass resection, and GI ulceration with perforation. These conditions all require an incision into the GI tract and recovery requires subsequent healing. Normal healing for any wound is characterized initially by platelet aggregation and activation followed by fibrin clot development. Once the GI tract wall is incised and the involved tissue sutured in apposition, the enterocyte regeneration begins almost immediately. During this initial healing phase (lag or inflammatory phase; days 3-14), the tissue provides very little strength and the wound is reliant upon the suture strength to prevent dehiscence. The subsequent phase of healing (proliferative or logarithmic phase) is characterized by proliferation of fibroblasts which produce collagen leading to a progressively stronger wound. By day 14, the stomach and small intestine have regained ~75% of the initial wound strength (the colon has only regained ~50% of the initial strength at the same point). The final phase (maturation phase; days 14-180) covers the final stage of healing in which collagen becomes cross-linked and the scar tissue decreases in size and thickness. Most cases of dehiscence develop during the inflammatory phase of GI wound healing and occur within 3-4 days following surgery.

Risk factors for dehiscence have been found to include pre-operative peritonitis, surgery/incision related to a GI foreign body, and albumin ≤25 g/L. An initial check for GI leakage can be performed at the time of surgery. Occlusion of the intestines ~10 cm apart and injection of 10-12 ml of saline into the lumen can allow evaluation for a small leak. Other factors which may lead to future dehiscence can be avoided at the time of surgery. Ischemic tissue should be completely removed at the time of surgery – the smooth muscle of the bowel should contract and experience peristalsis in response to pinching. The created wound should be well-apposed to permit more rapid formation of well-vascularized collagen. Additionally, suture should not be tied excessively tight. Absorbable monofilament suture is recommended – braided suture may permit bacterial migration and absorbable suture may help decrease future development of adhesions. Omentalization may help reduce dehiscence via improved blood supply and lymphatic drainage, as well as minimizing mucosal leakage.

Various medications can affect wound healing and their use should be considered before prescription. Glucocorticoids may have a negative effect on wound healing when administered prior to day 3 post-operatively. NSAIDs may also negatively affect the inflammatory phase of wound healing. As some surgeries may be the result of a GI neoplasm (either resection of a known intestinal mass or obstruction secondary to an unknown mass discovered during surgery), the effects of chemotherapy on wound healing should be considered. Vincristine and vinblastine seem to be safe at therapeutic doses, while cyclosphosphamide, doxorubicin, and cisplatin appear to delay wound healing. Frequently, cats and dogs undergoing a mass resection followed by resection and anastomosis of the small intestines recover for ~2 weeks post-operatively and then may start chemotherapy (if desired).

The benefits of enteral nutrition early in the post-operative period has become much more apparent in multiple scenarios in people. In people, enteral nutrition has been associated with fewer complications, a decreased length of hospital stay, and favorable cost-benefit analysis. A lack of enteral nutrition can lead to mucosal atrophy, reduced motility and subsequent ileus, and a greater potential for bacterial translocation. Enteral nutrition may also help accelerate the surgical wound healing of the GI tract. It is important to note that parenteral nutrition does not appear to have nearly the positive effect on the GI tract wall and healing that enteral nutrition has. Waiting to see if a patient will eat voluntarily following GI surgery is likely reasonable. However, if the patient refuses food (and presumably is not vomiting or regurgitating significantly), initiating enteral nutrition via a nasoesophageal tube, nasogastric tube, or esophagostomy tube within 24-48 hours should be strongly considered.

Post-operative ileus (POI) is another frequent, and potentially significant, complication following GI surgery. The development of POI is usually multifactorial and may be related to the disease process itself (e.g. over-distension of the GI tract as may occur with small intestinal obstruction or GDV), the surgery itself (e.g. afferent nerves stimulated during surgery), or the anesthetic or post-operative drugs administered

(opioids being the most commonly incriminated). Most likely, POI results from a combination of the aforementioned categories. Considerations to help reduce the incidence of POI include early ambulation, early feeding (preferably voluntary), nasogastric tube placement for gastric decompression, prokinetic therapy, and limiting opioid use (or performing a trial of an opioid antagonist). Nasogastric tube placement may provide the benefits of both allowing gastric decompression and permitting administration of enteral nutrition. Prokinetic agents that may combat POI include metoclompramide and cisapride, ranitidine or nizatidine (other H2-receptor antagonists do not exhibit acetylcholinesterase inhibition), lidocaine, and possibly ghrelin (or ghrelin-receptor agonists). The use of opioids should be considered and decreasing the dose and/or frequency of pure-μ opioid agonists should be an objective in any post-operative patient, but especially patients with POI.

Hypoalbuminemia is a frequent chemistry finding in patients following GI surgery. Mild cases of hypoalbuminemia may be monitored but cases of more moderate hypoalbuminemia (<20 g/L) may warrant colloid support. Available colloids include hydroxyethyl starches (HES), blood products (usually fresh frozen plasma or frozen plasma), and human serum albumin. Most studies in humans do not show improved outcome with HES, and many show an increase in adverse events (e.g. renal injury, coagulopathy, mortality). If used, plasma must be dosed aggressively (20-22 ml/kg with the goal of raising albumin by 5 g/L) to have an appreciable colloidal effect. Human serum albumin is used but has been associated with life-threatening complications following presumed immune-mediated reaction.

References

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