**Affection of intestine**

**Small Intestinal**

Intestinal obstruction is one of the most important problem that need surgical

intervention. Intestinal obstruction has two main types:-

1. Simple obstruction:- It is an obstruction of small intestinal lumen without

vascular compromise.

2. Strangulating obstruction:- Characterized by interference of intestinal

blood supply and blockage of intestinal lumen. Because vascular

compromise of the intestine is present at the onset of the condition, the

pathological changes associated with this problem are more acute and

severe than those associated with simple obstruction.

**Aquired Intestinal Lesions**

**1-Intestinal foreign body:-**

It is mostly reported in dogs and cats. Common foreign bodies includes stones,

children's toys, plastic pecking, and household fabrics. Many of these objects

pass through the GIT without problems, others require surgical intervention.

Medical treatment is seldom curative. Most foreign bodies can be removed by

enterotomy

**2-Intussusception:-**

It is invagination (telescoping) of a segment of intestine (intussusceptum) and

its mesentery into the adjacent distal segment of bowel (intussuscipiens) and

usually cause bowel obstruction. Occasionally an intussusception occurs at

multiple sites. Puppies and kittens and young horses are most commonly

affected. The most common sites of intussusception are jejunum, ileum or

terminal ileum (ileo-cecal area).

The exact cause of this disorder is unknown, but it is probably due to

abnormalities of peristalsis. Any factors that alter intestinal motility could

therefore lead to the development of the condition. These factors include heavy

ascarid infection, sudden dietary changes, enteritis (canine distemper)

mesenteric arteritis, simple obstruction

**3-Strangulation:-**

A loop of small intestine herniated through an abdominal wall defect or internal

herniation, and when associated with vascular occlusion it is known as

strangulation. This phenomenon is most commonly seen with inguinal hernia

and traumatic ventral hernias. Umbilical hernias rarely cause bowel obstruction.

**4-Traumatic injuries:-**

Penetrating abdominal wounds and blunt abdominal trauma commonly injure

the intestine or the mesentery and associated vasculature.

Penetrating wounds, such as gunshots wounds of the abdomen should be

explored immediately and the entire bowel should be examined.

**5-Intestinal neoplasms:-**

The intestine is occasionally the site of Neoplasia in small animals.

Adenocarcinoma, Leiomyoma, and lymphosarcoma are the most common

neoplasm. Clinical sings are commonly those of partial obstruction. Metastasis

often occurs to regional lymph nodes, liver, spleen, and peritoneum. Early

diagnosis, followed by wide resection of the affected bowel and histopathlogic

conformation should be performed.

**6- Volvulus:-**

It is produced by a 180 degree or greater rotation of a segment of jejunum or

ileum about the long axis of the mesentery. Volvulus is uncommon in the small

animals because of the short mesenteric attachments.

Volvulus may occur as a primary displacement or may be secondary to a preexisting lesion such as incarceration in mesentery, epiploic foramen,

gastrosplenic ligament, Meckel's diverticulum, and adhesions.

**Embryonic Anomalies of Small Intestine**

1**-Meckel's Diverticulum**:-

This results from persistence of a portion of the omphalo-mesenteric (vitel line)

duct, which is usually obliterated and disappears. It is presented as a finger like

2 cm in diameter and 4-6 cm long projecting from the antimesenteric surface of

the ileum with a fibrous band, connecting the diverticulum to the abdominal

wall in the area of the umbilicus. The lumen of the diverticulum communicates

with the lumen of the ileum. It cause Volvulus to the small intestine.

**2-Mesodiverticular bands:-**

It is formed by persistence of a distal segment of a vitilline artery. The band

extends from one side of the small intestinal mesentery to the antimesenteric

surface of the intestine (usually jejunum). A triangular hiatus is formed between

the mesodiverticular band, jejunal mesentery, and jejunum. Entrapment of

intestine in the hiatus can cause herniation of intestine through jejunal

mesentery and secondary Volvulus.

**Clinical Sings of Intestinal Lesions**

Clinical sings depend upon the location of the intestinal lesion and wither the

lesion has totally or partially obstruct the lumen. Both total and partial

obstruction have the sings of : nausea, anorexia, restlessness, depression,

abdominal pain and abdominal distension.

Generalized weakness due to loss of body fluids and electrolytes. Severe

vomiting usually results in a metabolic alkalosis because of the loss of gastric

fluids.

The sings of incomplete obstruction are variable and chronic. Feces are usually

present and may appear normal, or may they contain blood and excessive

mucus.

The clinical sings also depend on either it is a proximal or distal obstruction:

**Distal obstruction**

1. The onset of the obvious clinical sings may be delayed for several days.

2. Vomiting is late in disease process.

3. Abdominal distension is less noticeable because the fluids have been

absorbed proximal to the obstruction.

4. The vomits is more likely to be fetid with distal obstruction because of

increased breakdown and bacterial action.

5. May take the form of chronic disease.

**Proximal obstruction**

1- cause vomiting earlierin the disease process.

2- More acute and life threatening.

**Diagnosis of Intestinal Lesions:-**

1. Abdominal pain and distension may present, with accurate palpation

foreign bodies and tumor masses are often palpable.

2. Through physical examination.

3. An intussusception has the feel of an elongated sausage in the abdomen.

4. Strangulated intestine may be palpable as distended painful gas and fluid

filled loops of bowel leading to a hernia ring.

5. Dehydration, dry mucous membranes, elevated pcv and total plasma

protein is commonly observed. Leukocytosis and elevation of the blood

urea nitrogen.

6. Radiographs is a useful method for diagnosis, especially of foreign

objects and soft tissue masses.

7. Exploratory laparotomy is one of the most useful diagnostic technique.

Exploration should not postponed because mortality rates increase rapidly

with time.

**Enterotomy and Intestinal Resection and Anastomoses**

**Enterotomy:-**

The primary indication for performing enterotomy is the ingestion of the

foreign body.

Operative procedure:- Using of barbiturates and inhalation with methoxyflurine

or halothane are favored for general anesthesia.

1. The abdomen is prepared for a midline incision of adequate length to

explore the entire GIT.

2. The incision edges are draped with saline moistened laparotomy sponges

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3. The entire abdominal cavity must be explored, beginning at the stomach

and working down the intestinal tract.

4. The abdominal viscera must be always be handled gently to prevent

shock and postoperative ileus.

5. The affected bowel segment is isolated and brought outside the

abdominal incision.

6. The intestinal contents are gently milked out both proximal and distal to

the obstruction.

7. An assistant's fingers or intestinal clamps are applied on either side of the

foreign body to aid in manipulation of the bowel and to keep the

intestinal contents out of the surgical field.

8. An incision is made on the antimesenteric border in healthy tissue, a

longitudinal or transverse incision may be used.

9. The foreign body is then milked out the enterotomy site.

10. The enterotomy incision may be closed with a simple appositional or

inverting technique.

11. Perforating wound could be closed by purse-string suture.

**Intestinal resection and Anastomosis**

Principles of intestinal anastomosis:-

1. Incorporate the sub mucosal layer in the anastomoses.

2. Anastomose to provide serosa to serosa contact.

3. Minimize trauma and contamination.

4. Maintain adequate blood supply.

5. Avoid tension across the anastomoses.

**Indications of intestinal resection:-**

1. Injury to the intestinal wall, or tears in the mesentery along the

intestinomesenteric border.

2. Obstruction.

3. Irreducible intussusception.

4. Neoplasms and scars resulting from vascular accidents or trauma to the

intestine.

5. Intestinal infarction associated with arterial thrombosis.

**Intestinal resection and Anastomosis**

A. Occlude the segment with intestinal forceps and fingers, then ligate the

mesenteric vessels that supply the diseased segment to be resected,

then transect the intestine and mesentery as indicated by the dashed lines.

B. Apply the first suture at the mesenteric border and the second at

antimesenteric border.

C. Anastomosis is continued by simple interrupted sutures or any other

inverting techniques.

**Types of intestinal Anastomosis:-**

There are 3 main types of intestinal anastomoses:-

1. End- to- end anastomosis which the most commonly used technique.

2. End-to- side anastomoses, mostly used for anastomosis between ileum

and cecum and between duodenum and the stomach.

3. Side-to-side anastomosis which has very limited use because it lead to a

pouch formation by the blind end of the bowel in which the ingesta is

accumulated causing digestion disturbance and abdominal pain.

**End to end anastomosis can be accomplished by several methods, which**

**can classified into:-**

1. Inverting technique:- In this technique the edges of the incision was

rolled inside the lumen leading to serosa to serosa contact. This technique

can be accomplished by single row of continuous Connell suture pattern,

if there is a leak from the anastomosis site appear, a second row of

cushing suture is applied. This technique always associated with stenosis

of the bowel at the site of the anastomoses, but adhesion was rarely

accompanied with the inverted technique.

2. Everting technique:- In this technique the edges of the incision was

projecting outside the lumen leading to mucosa to mucosa contact. This

technique can accomplished by inserting interrupted horizontal mattress

pattern. In this technique there is a chance leakage, and more likely

associated with adhesion.

3- Apposition technique:- In this technique the 4 layers of the intestine in one

side of the incision will be nearly in apposition with the same 4 layers of the

apposite side of the incision. This technique can be accomplished by using

either, a simple interrupted pattern, crushing pattern, and Gambee suture

pattern. Apposition technique maintain normal intestinal diameter at the site of

anastomosis particularly when Gambee suture technique is used.

**Anastomosis of intestinal segments of varying diameters:-**

Dilation of the proximal segment necessitates joining intestine of unequal

diameters.

The problems can be overcome by one of the following methods:-

1- Increasing the diameter of the narrow segment by using oblique or angled

incision.

2- Tapering technique used on the dilated segment by removing a triangular flap

from the antimesenteric border and suturing it this will lead to tapering or

narrowing of the dilated end.

**Complications of intestinal anastomoses**:-

1.leakage: escape of intestinal contents to the abdominal cavity due to a defect

in performing Anastomosis, it could lead to peritonitis and septicemia.

2. Adhesions: it is always associated with everted anastomosis technique due to

projection of mucosa which is already has large numbers of microorganisms

and mucous secretions which causing irritation and adhesion formation, and

also the presence of blood will aids the development of adhesion.

3. Anastomosis dehiscence: it is the slipping of the Anastomosis site and

separation of the intestinal segments from each other in few days after

operation. It is an uncommon problem in animals, the exact cause of this

condition is not well understood, in human it was reported in older patients with

hepatic diseases and in patients having hypoproteinemia as well as in pregnant

patients.

4. Stenosis: mostly associated with inverted anastomosis technique in which a

two rows of suturing are applied. It not cause a severe problem in the small

intestine, but it is serious when occurs in large intestine because of the nature of

the content in large intestine is solid that may lead to blockage of the intestinal

lumen at the site of stenosis

5. Ileus: it is the most important and serious complication following intestinal

surgery, characterized by of peristaltic movement of the intestine (paralysis of

intestine) due to sympathetic inhibition of the gut.

**Clinical sings of ileus:-**

1. Intestinal atony.

2. Distention and gas formation.

3. Loss of body fluids and electrolytes into the lumen of the dilated

intestine.

4. Increased thirst.

5. Failure to defecate.

6. General depression.

**Treatment of ileus:-**

1. Correction of electrolytes and fluid imbalances.

2. Given of parasympathomimetic drugs, such as eserine, but it has limited

effect when ileus is exists.