

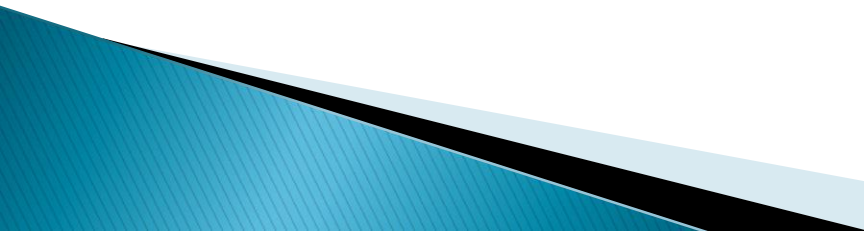
# Laparotomy

By

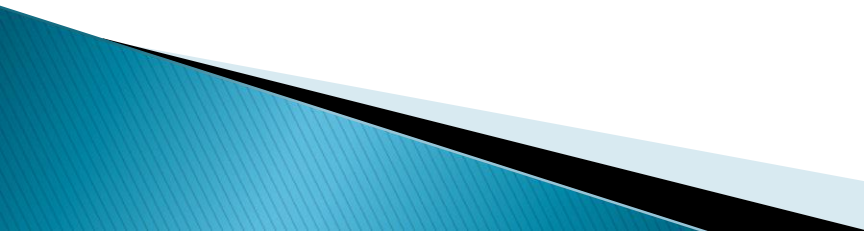
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2017

# Definition

- ▶ Surgical procedure to open the abdominal wall for good exposure of the abdominal and/or pelvic organs.
  - ▶ Lapar = abdomen and otomy = incision or opening.
  - ▶ Laparotomy = Celiotomy
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# Indications

- ▶ For exploration of the abdominal cavity to facilitate diagnosis (Open and See)
  - ▶ For drainage of abdominal cavity from ascitic fluid (in cases of hepatic, cardiac and renal dysfunctions), urine (in case of ruptured urinary bladder) and lavage (in case of perforated abdominal wound).
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# Indications

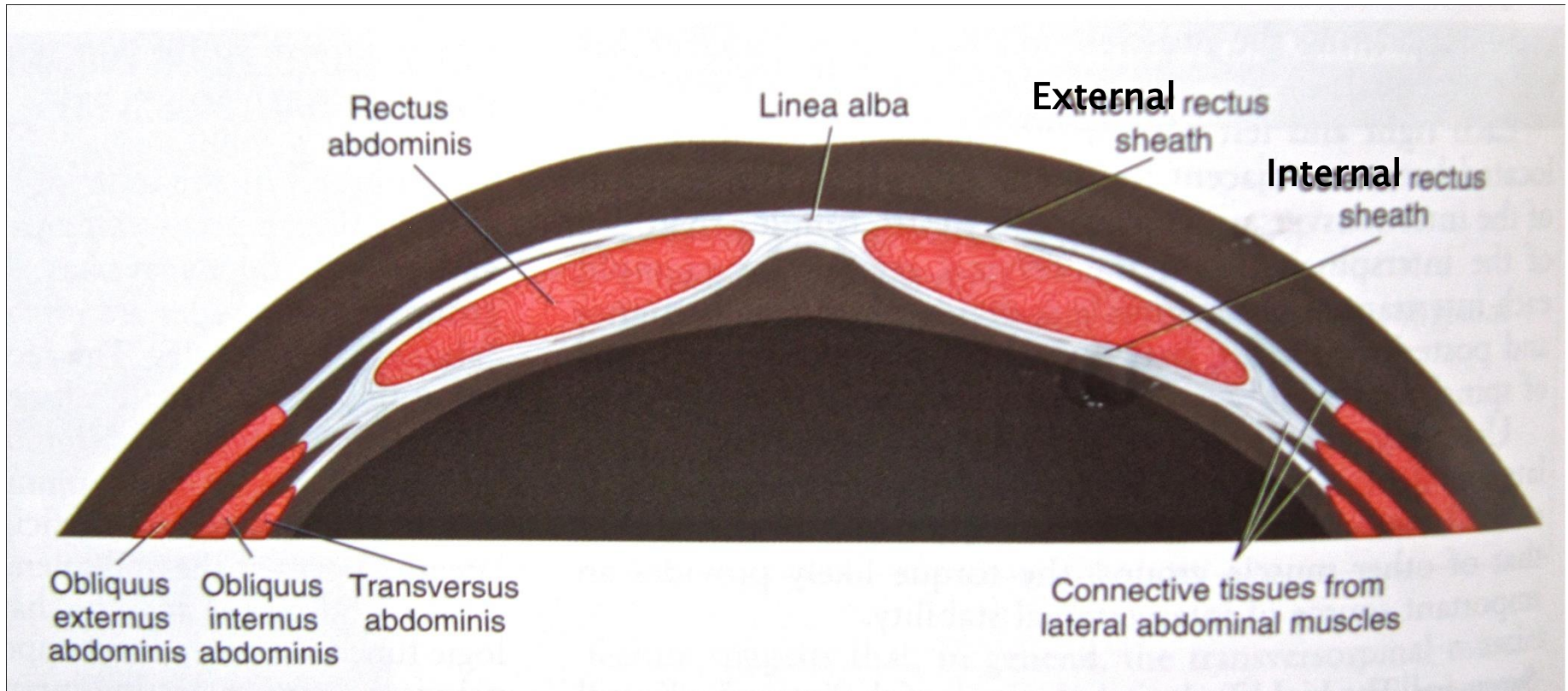
- ▶ For any surgical interference in the internal organs such as:
  - Gastrointestinal tract (gastrotomy, enterotomy, rumenotomy, abomasopexy, intestinal resection and anastomosis).
  - Excision of any abdominal neoplasms.
  - Hepatic, splenic and pancreatic surgeries.

# Indications

-Urogenital tract (ovariectomy, ovariectomy, caesarian section, cystotomy, nephrotomy, nephrectomy, prostatectomy and abdominal cryptorchidectomy).

- ▶ For herniorrhaphy.
- ▶ For experimental studies

# Surgical Anatomy



# Surgical Anatomical Division of Abdomen

- ▶ The abdomen is divided into three regions by two planes; a line between the margins of last ribs and a line between the tuber coxae
- ▶ These regions include:
  - Epigastric region (Cranial third).
  - Mesogastric region (Middle third).
  - Hypogastric region (Caudal third).

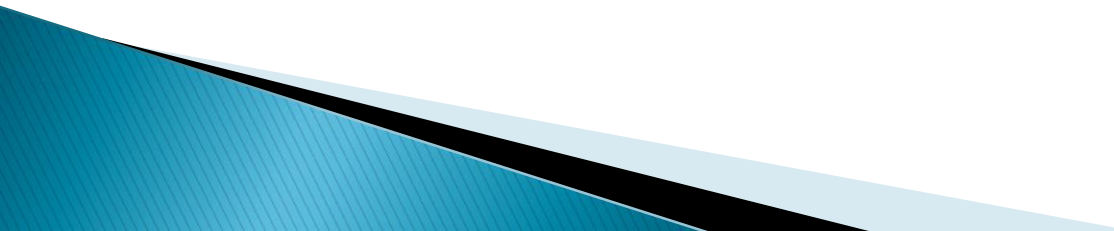
# Surgical Anatomical Division of Abdomen

- ▶ These main regions are subdivided by two sagittal planes; drawn from middle of inguinal ligaments and parallel to linea alba as follow:
- ▶ **Epigastric region:**
  - Xiphoid area (Suitable for gastrotomy and splenectomy)
  - Left paracostal (hypochondric) area (Suitable for splenectomy)
  - Right paracostal (hypochondric) area (Suitable for hepatic surgeries)



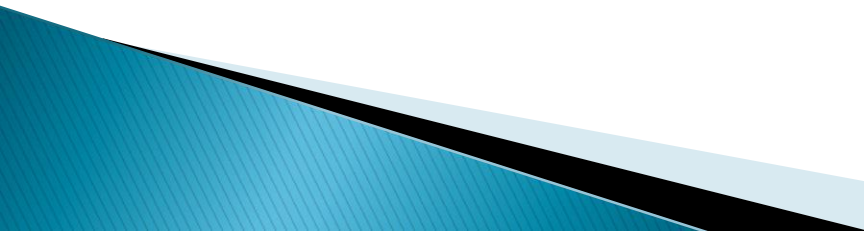
# Surgical Anatomical Division of Abdomen

## ▶ **Mesogastric region:**

- Umbilical area (Suitable for ovariectomy)
  - Left lumbar area (Suitable for surgeries of the left kidney)
  - Right lumbar area (Suitable for surgeries of the right kidney)
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# Surgical Anatomical Division of Abdomen

## ▶ Hypogastric region:

- Prepubic area (Suitable for cystotomy and hysterectomy in females)
  - Left inguinal (iliac) area (Suitable for cystotomy in males)
  - Right inguinal (iliac) area (Suitable for cystotomy in males)
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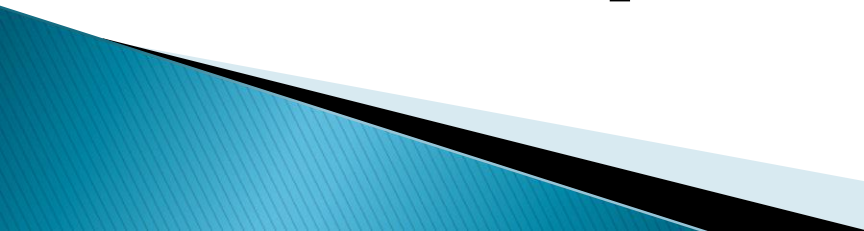
# Different Surgical Approaches of Laparotomy

- ▶ **Ventral midline laparotomy:** In which, laparotomy is performed through linea alba. It is divided into:
  - Cranial midline laparotomy (as in gastrotomy)
  - Middle midline laparotomy (as in ovariectomy)
  - Caudal midline laparotomy (as in cystotomy in females)

# Different Surgical Approaches of Laparotomy

- ▶ **Paramedian per-rectus laparotomy:** In which, laparotomy is performed through rectus abdominis muscle. It is divided into:
  - Cranial paramedian per-rectus laparotomy (as in splenectomy)
  - Middle paramedian per-rectus laparotomy
  - Caudal paramedian per-rectus laparotomy (as in cystotomy in males)

# Different Surgical Approaches of Laparotomy

- ▶ **Paramedian lateral-rectus laparotomy**
  - ▶ **Paracostal laparotomy**
  - ▶ **Ventral midline-paracostal laparotomy**
  - ▶ **Paralumbar-paracostal laparotomy (lazy S shape)**
  - ▶ **Inverted T laparotomy (Mercedes shape)**
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# Laparotomy Technique

## ▶ Anesthesia:

- Equine: Deep narcosis by chloral hydrate 5g/50kg, 10% solution, given I/V + Local linear infiltration of lignocaine HCl (1ml/1cm).
- Ruminants: Xylazine HCl 2% at a dose of 0.1mg/kg + Local linear infiltration of lignocaine HCl (1ml/1cm)

# Laparotomy Technique


- Dogs and cats: general anesthesia by atropine sulphate (0.1mg/kg, S/C)+Xylazine HCl 2% (1mg/kg, IM or IV) + Ketamine HCl 5% (5-10mg/kg in dogs and 20-33mg/kg in cats, IM or IV) + Thiopental sodium for maintenance in dogs (25mg/kg 2.5 %, IV).

## **Control:**

Dorsal or lateral recumbency depending upon the laparotomy approach.

# Laparotomy Technique

## ▶ **Pre-operative technique:**

- Fasting of the animal
  - Clipping and shaving of hair at the site of laparotomy.
  - Washing with water and soap
  - Dryness with sterile towel
  - Disinfection with Ethyl alcohol
  - Painting with Povidone iodine
  - Draping with sterile towels.
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# Laparotomy Technique

## ▶ **Surgical technique:**

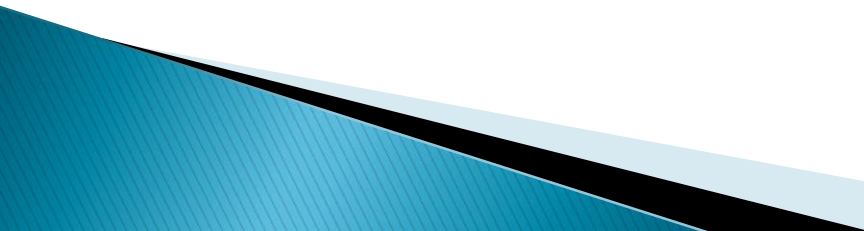
- Skin incision
- Blunt dissection of s/c tissues.
- Raising of the abdominal muscles during opening of peritoneal cavity by stab incision.
- Widening the abdominal wound by scissors while guarding the viscera by fingers.
- Exteriorization of the affected organ outside the abdominal wound and wrapping with sterile gauze soaked with warm normal saline.

# Laparotomy Technique

- Surgical manipulation of the affected organ
  - Returning the organ to its normal position inside the abdominal cavity.
  - Suturing of the peritoneum and abdominal muscles with absorbable suture materials and simple interrupted or horizontal mattress pattern.
  - Suturing of s/c with absorbable suture materials and simple continuous pattern.
  - Suturing of the skin with non absorbable suture material and simple interrupted pattern. (Video 1)
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# Laparotomy Technique

## ▶ **Post-operative care:**

- Application of abdominal bandage.
  - Administration of systemic antibiotics
  - S/C administration of antitetanic serum in equine (3000 IU in horses and mules – 1500 IU in donkeys)
  - Daily dressing of the wound with Povidone iodine.
  - Removal of the stitches after 7-10 days.
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# Complications

## ▶ Hemorrhage

### **Causes:**

- Opening of the abdominal wall (External bleeding)
- Improper suturing of the visceral organ (Internal bleeding)

### **Treatment:**

- Ligation of the bleeders
- Cauterization

### **Prevention:**

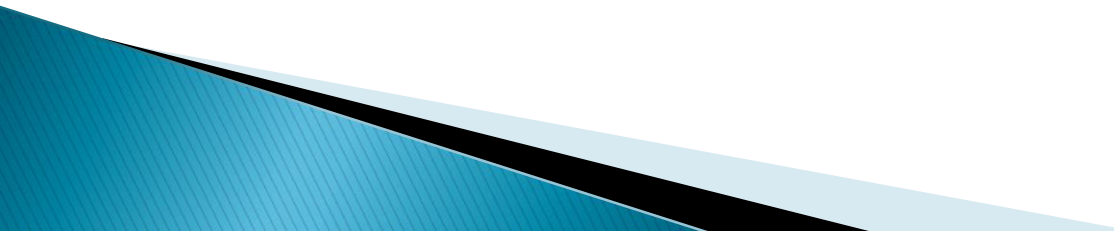
- Proper suturing

# Complications

## ▶ **Post-operative seroma**

- Post-operative swelling around the wound due to inflammation

## **Treatment:**

- Systemic antibiotics
  - Good drainage by removal of the lowest stitch.
  - Daily exercise.
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# Complications

## ▶ Infection

- Either local or diffuse peritonitis
- The severity depends upon; amount of microorganisms, its virulence and the animal's immunity

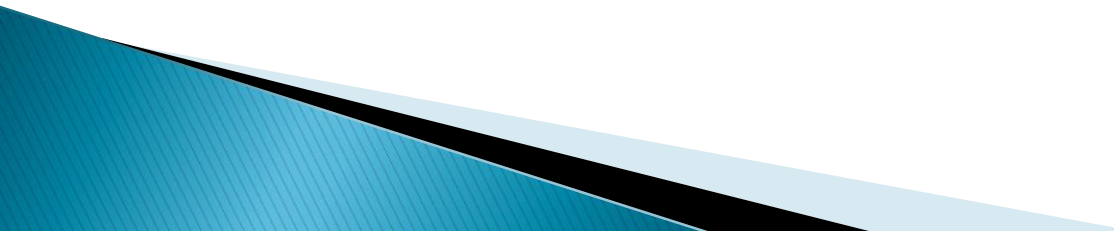
### **Causes:**

- Improper surgical asepsis
- Dehiscence of visceral suture

### **Treatment:**

- Intra-abdominal and systemic antibiotics
- Suturing of the ruptured organ's sutures.

### **Prevention:**

- Proper aseptic surgery
  - Proper suturing
- 

# Complications

## ▶ **Fistulation**

- Such as ruminal fistula in bovine and caecal fistula in equine

### **Cause:**

- Due to improper suturing of the gut which leads to leakage of gut contents and consequently subperitoneal abscess formation. This abscess opens to outside by a fistula.

### **Treatment:**

- Re-operation for excision of the fistula.

### **Prevention:**

- Proper gut suturing.

# Complications

## ▶ **Incisional hernia**

### **Causes:**

Improper suturing of the abdominal wall

Weak scar tissue formation at the site of surgery.

### **Treatment:**

- Re-operation

### **Prevention:**

- Proper suturing of the abdominal wall

- Avoid the increase in intra-abdominal pressure after laparotomy



# Complications

## ▶ **Incarceration of the bowel**

### **Cause:**

- Improper suturing of the peritoneum

### **Treatment:**

- Re-operation

### **Prevention:**

- Proper suturing of the peritoneum
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# Complications

## ▶ **Subcutaneous abdominal emphysema**

- Accumulation of air or gases under the skin at and around the operation's site.

### **Cause:**

- Improper suturing of the peritoneum leads to escape of the air inside the abdominal cavity to s/c , during the conversion of the positive pressure into a negative pressure.

### **Treatment:**

- Daily massage of the emphysema.

### **Prevention:**

- Proper suturing of the peritoneum

# Complications

## ▶ **Wound dehiscence**

- Rupture of the stitches with or without prolapsed viscera.

### **Causes**

- Improper suturing of the abdominal wall
- Infection
- Vicious animals (licking, biting, scratching of the stitches).

### **Treatment:**

- Reoperation
- Excision of any necrosed tissues.

### **Prevention:**

- Proper suturing of the abdominal wall.
- Application of abdominal bandage
- Daily dressing of the wound with antiseptic solution.