



Clinical Surgery

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Dedicated to
My Dear Parents

Jaypee Brothers

Preface

In these days, when there is a tendency for ward rounds, to be sometimes nothing but recitals of biochemical, radiological and endoscopic findings, the patient's clothes unruffled, and the patient a silent witness, the importance of a book about clinical surgery cannot be overemphasized.

This book aims to help the medical student or clinician to meet the many challenges that they face in the clinical setting today.

It is my collective hope that this book will be as useful and popular as its predecessors.

Mahmoud Sakr

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ANTERIOR ABDOMINAL WALL

Rectus Sheath Hematoma

Etiology

It results from rupture of one of the branches of the inferior epigastric artery and less importantly from tearing of the muscles.

1. Spontaneously: In patients with collagen disorders, blood dyscrasias or on anticoagulants.
2. Direct external abdominal trauma or endogenous trauma: For example, violent coughing, and retching.

Clinical Picture

- Rectus sheath hematoma occurs in three dissimilar types of patient:
 1. Elderly women, often thin and feeble.
 2. Athletic muscular men, usually below middle age.
 3. Pregnant women, mainly multiparous and late in pregnancy (mechanical stress on the blood vessels).
- Main clinical manifestations include:
 1. Abdominal pain and a tender abdominal mass, within or behind the rectus sheath, simulating a tumor. It is situated mostly below the umbilicus where the posterior rectus sheath is lacking. Persistence and fixation of the mass during contraction of rectus muscles help localize the condition to the anterior abdominal wall (AAW) (Fothergill's sign).
 2. Muscle spasm and tenderness simulating acute abdomen that should be ruled out.
 3. The skin shows bluish discoloration which is diagnostic, if present.
 4. Symptoms of RSH are nausea, vomiting, and mild fever and leukocytosis postural hypotension is rare.

Investigations

Ultrasound (US) and computed tomography (CT) scan are useful in difficult cases.

Differential Diagnosis

1. In females: Twisted ovarian cyst or ectopic pregnancy.

2. In both sexes: Acute appendicitis, diverticulitis, aortic aneurysm, strangulated spigelian hernia, and abdominal tumors.

Tumors of the Abdominal Wall

Classification

1. Benign tumors: Lipoma, neurofibroma, keratosis and papilloma, hemangioma.
2. Locally malignant: Desmoid tumor
3. Malignant tumor
 - a. Primary tumors: Epidermoid cancer, melanomas, sarcomas (neurofibrosarcoma, liposarcoma, rhabdomyosarcoma).
 - b. Secondary tumors:
 - By implantation in laparotomy incisions
 - By direct extension from intra-abdominal tumors (stomach, colon, ovary, uterus)
 - Metastatic from the breast or bronchus.

Desmoid Tumor (Recurrent Paget's Fibroma)

Definition

A tumor arising in the musculoaponeurotic structures of the AAW, especially below the level of the umbilicus.

Pathology

Desmoid tumor is a completely noncapsulated fibroma. It infiltrates the surrounding muscles causing severe destruction and may undergo myxomatous changes.

Etiology

1. May be related to trauma, as it may occur in scars or during pregnancy due to stretch of muscle fibers.
2. It may occur in a variant of familial polyposis known as Gardner's Syndrome.

Diagnosis

- It occurs more in women, in third or fourth decades of life, usually below the umbilicus.
- Tumor: Slowly progressive, hard (it creaks during cutting), easily palpable deep to the skin and can be made more prominent by contraction of the rectus muscles (Fothergill's sign). There is no tenderness and no evidence of intra-abdominal disease
- CT scan may be useful in difficult cases + *biopsy* for definitive diagnosis.
- Metastases never occur, but it has a very high rate of local recurrence because it is completely noncapsulated and infiltrates the surrounding muscles.

Hernia of Anterior Abdominal Wall

Definition of Hernia

Protrusion of normal cavity contents through the covering wall (muscle and fascia) that contains it. The term is applied to protrusion of intra-abdominal organ through a defect in the abdominal wall, pelvis or diaphragm.

Clinical Approach of a Case of Ventral Hernia

History Taking

Personal history (personal data)

1. Age

- Childhood _____ Congenital umbilical hernia
- Adulthood _____ Epigastric hernia, paraumbilical hernia (PUH) and incisional hernia.

2. Sex

- Males > females: _____ Epigastric hernia
- Females > males: _____ PUH, incisional hernia.

Occupation: Heavy weight lifting (heavy work may precipitate or aggravate a hernia).

Repeated pregnancy: Result in weak AAW and increased intra-abdominal pressure by the gravid uterus.

Symptoms (complaints)

1. Painless swelling

- In the epigastrium _____ Epigastric hernia or fatty hernia of the linea alba
- Around the umbilicus _____ PUH
- Along an old incision _____ Incision hernia (or recurrent hernia).

2. Associated pain

- Dyspeptic: Due to pull on the omentum or mesentery (epigastric or PUH)
- Recurrent colicky: Due to subacute attacks of intestinal obstruction.

3. Symptoms of complications: Bowel Obstruction (vomiting, constipation and distention).

Present history

1. Swelling

- Onset: Insidious, after carrying heavy objects, with straining (coughing, constipation and dysuria).
- Course and Duration: Progressive or stationary.

- Shape: Spherical (epigastric hernia, PUH).
 - Size: increases by effort and straining and decreases by lying down.
 - Reducibility: Spontaneous or manual (surgery has to be considered early if there history of repeated attacks of irreducibility).
2. Straining: Due to chronic cough, constipation of prostatic hyperplasia (old male).

Past history: History of previous operation for hernia repair or for other conditions

- Abdominal: For example, appendectomy (injury of ilioinguinal or iliohypogastric nerves) causes incisional hernia
- Anal Surgery: For example, anal stenosis (causes chronic constipation)
- Urological: Urethral stricture, prostatectomy (SHP).

Family history: Family history may be positive due to weakness of the mesenchyme (defect in the metabolism of collagen), but usually there are no genetic or environmental factors.

Special habits: Smoking: It causes bronchitis and therefore must be stopped before operation.

Clinical Examination

General examination

1. General condition: Pallor (anemia) and hypoproteinemia cause poor healing and predispose to recurrence.
2. Chest and Heart: Recurrence may occur if chronic bronchitis is not treated before surgery.
3. Abdomen
 - Swelling, organomegaly, pregnancy or ascites—increase intra-abdominal pressure.
 - Scars of previous operation(s): Incisional or recurrent hernia
 - Divarication of recti: Weak abdominal muscles
3. PR examination: Anal fissure, stricture or enlarged prostate (should be treated first).

Local examination

Inspection: Ask the patient (standing) to cough. A hernia will be shown as a lump that bulges on coughing. Comment on the following:

- Site: Relation to the umbilicus
 1. Epigastric hernia: Away from the umbilicus, in the midline of the epigastrium.
 2. PUH: About 1 inch from the umbilicus and distorting it
 3. Spigelian hernia: Below the umbilicus (above it in 3% only), above and parallel to the inguinal ligament.

- Size: shape and direction of descent
- Skin over is inspected for discoloration, dilated veins or scars of previous operations (incisional hernia)
- Secondary changes, such as redness or discoloration of overlying skin.
- Impulse on cough: Better seen than felt.

Palpation

- Tenderness: Not tender unless complicated
- Local Temperature: Normal, unless inflamed or strangulated
- Confirmation of information obtained by inspection
- Impulse on cough.

Percussion: Resonance—intestine, while dullness—omentum.

Auscultation: Peristalsis—intestine, if silent—omentum.

Examination of abdominal wall strength: Gives an idea about the type of repair needed.

Inspection

1. Rising up test:
 - Midline bulge: Divarication of recti
 - Lateral bulge: Malgaigne bulge, i.e. diffuse bulging of the AAW just above the iliac crest and the inguinal ligament denotes weak musculature (if muscles are strong, retraction instead of bulging will be seen).
2. Observe the patient in profile: Undue protrusion of the lower half of the abdomen denotes weak muscles.

Palpation: Palpation of the abdominal wall during cough. Resistance denotes strength.

Diagnosis

For a complete diagnosis of a hernia, the following questions should be answered.

Is it a hernia or not?

The three criteria for diagnosis of a hernia (noncomplicated) are:

1. Present in an anatomical site of a hernia.
2. Presence of impulse on cough.
3. Reducibility (NB: Incomplete reducibility is normal in fatty hernia of the linea alba).

What is the site affected?

1. Epigastric region: Fatty hernia of the linea alba—epigastric hernia.
2. Around the umbilicus: Umbilical or PUH.
3. Above and parallel to the inguinal ligament (below the umbilicus): Spigelian hernia.
4. On a previous scar: Incisional hernia.

Is it noncomplicated (reducible) or complicated?

This is important in deciding urgency of the operation, e.g. a strangulated hernia is an extremely urgent operation to avoid gangrene of the intestine, while an irreducible hernia is less urgent, but should not be left untreated.

What are the swellings that give an impulse on cough?

In General:

Site	Disease
Skull	Meningocele
Respiratory tract	Laryngocele, pneumatocele, empyema necissitans (pleural cavity)
Abdomen and scrotum	Hernia (peritoneal cavity), varicocele (venous system)
Lower limbs	Saphena varix (venous system)

Epigastric Hernia and Fatty Hernia of Linea Alba*Definitions*

1. Fatty hernia of the linea alba: Protrusion of the extraperitoneal pad of fat through a weak part, between the interlacing fibers of the linea alba, in the midline, anywhere between the xiphoid process and the umbilicus (**Figure 7.1**).
2. Epigastric hernia; When a fatty hernia of the linea alba enlarges, it pulls with it the peritoneum forming a true hernia with a sac.

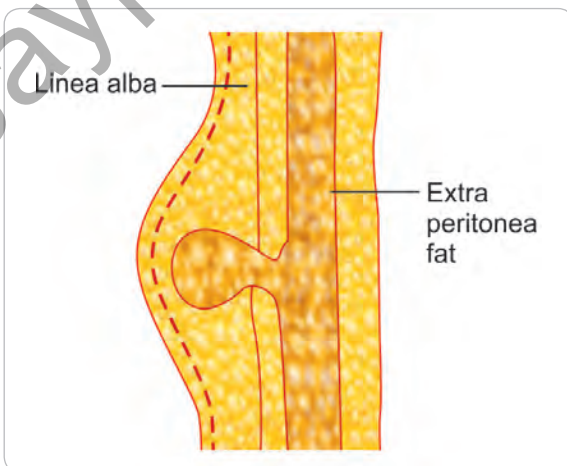


Fig. 7.1: Fatty hernia

Criteria	Fatty hernia	Epigastric hernia
Peritoneal sac	-ve	+ve
Impulse on cough	-ve	+ve
Contents	No contents	Omentum or intestine
Dyspepsia	-ve or rare	+ve

Clinical Picture

- Sex: It occurs more in males than females (3:1).
- Age: Most common between 20 years and 50 years of age
- Symptomless: Discovered only in the course of routine abdominal palpation (better felt than seen).
- Swelling
 1. Small in size.
 2. In the midline above the umbilicus (**Figure 7.2**).
 3. Painless (sometimes painful) simulating a spindle cell (SC) lipoma.
 4. Irreducible, but with an impulse on cough.
 5. Does not move freely.
- **Dyspepsia:** Epigastric pain, vomiting and upper abdominal distention may be present especially in epigastric hernia simulating peptic ulcer, gallbladder disease and hiatal hernia.

Divarication of Recti

Definition

The linea alba is stretched into a thin wide and weak fibrous sheath causing a bulge between the recti on straining or rising up (inspection) and the finger can be dipped in while the abdomen is lax (palpation).

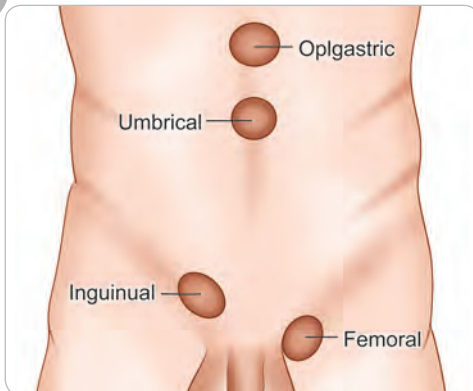


Fig. 7.2: Epigastric hernia (note: site)

Presentation

- *In babies:* It is seen above the umbilicus as a self-limited condition with development
- *In adults:* It is common in Egyptian farmers with schistosomal hepatic fibrosis and splenomegaly and in multiparous women.

Umbilical Hernia

Congenital Umbilical Hernia

Definition: Congenital umbilical hernia is a true hernia that occurs during infancy or childhood due to weakness of the umbilical scar. Straining (colic or during micturition) helps the occurrence of this hernia.

Predisposing factors: Premature babies, black babies and those with hypothyroidism.

Clinical picture: When the baby cries a lump protrudes at the umbilicus. It is variable in size, usually spherical, reducible and the defect can be felt. An expansile cough impulse is invariable present. It may have a huge size and the skin over may be very thin from protrusion of gut.

Adult Paraumbilical Hernia

Pathology

- **Sac:** Narrow neck, may reach a huge size and may have adhesions with the contents
- **Contents:** Omentum, intestine (small bowel or colon)
- **Coverings:** Extraperitoneal fat, SC tissue and skin (**Figure 7.3**).

History

- **Age:** Middle and old age
- **Sex:** it is common in fatty females, usually multiparous, i.e. on top of weak AAW and increased intra-abdominal pressure (females > males, 5:1).

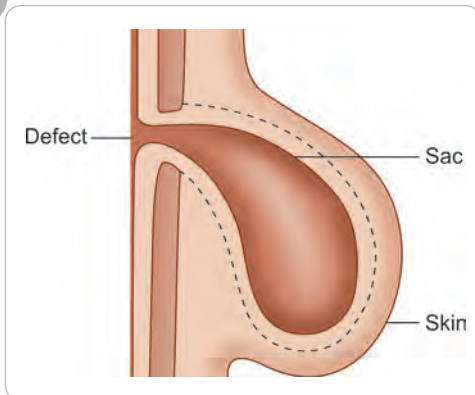


Fig. 7.3: Diagrammatic representation of paraumbilical hernia

- **Predisposing factors:** Obesity and multiple pregnancies, ascites with liver cirrhosis and presence of a large intra-abdominal tumor for a long time.



Fig. 7.4: Clinical Presentation of paraumbilical hernia

- **Symptoms (complaints)**

1. Swelling (**Figure 7.4**): It enlarges rapidly and becomes lobulated and painful and it may become irreducible due to adhesions between the contents and/or the sac.
2. The linea alba is thinned and stretched. There may be divarication of recti.
3. It may cause local dragging pain or colicky pain.
4. Recurrent attacks of dyspepsia, colic, constipation and flatulence (partial or recurrent obstruction).

- **Complications:** Mainly irreducibility, inflammation, obstruction and strangulation, which is common due to narrow neck, sharp edge of the defect, multiple loculations, huge contents and adhesions.

Clinical examination

- **Site:** About 90% above and 10% below the umbilicus (because the linea alba is broader and perforated by blood vessels above the umbilicus)
- **Edge:** Well-defined except when the patient's abdominal wall is very fat
- **Consistency:** Firm (omentum) or soft (intestine—resonant to percussion)
- **Reducibility:** It could be reduced and a midline defect is felt
- **Impulse on cough:** Most of these hernias have an expansile impulse on cough.

Incisional Hernia

Definition

A hernia that occurs on top of scar of a previous operation (other than a previous repair of a hernia (**Figure 7.5**), otherwise it is called a *recurrent hernia* (**Figure 7.6**).

Pathogenesis

Etiologically, there are two types of incisional:

1. **Early hernias** that appear soon after the original laparotomy, often involves the whole length of wound and becomes large. It is usually



Fig. 7.5: Incisional hernia

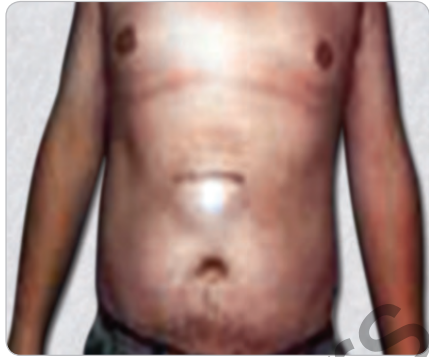


Fig. 7.6: Recurrent hernia

due to failure on part of the surgeon. It results from poor surgical technique, sepsis, draining tubes, laparotomy for peritonitis or cancer, poor general condition of the patient and postoperative complications.

- Late hernias** that appear after 5–10 years, after operation for no obvious reasons. It results from tissue failure (failure of scar collagen, for unknown reasons, after maturation. Aging and weakness of tissues and increased intra-abdominal pressure associated with cough, constipation, and prostatism are cited as factors.

Etiology

Preoperative causes	Operative causes	Postoperative causes
Straining factors <ul style="list-style-type: none"> Chronic cough Chronic constipation Difficulty of micturition (enlarged prostate, stricture urethra) General condition <ul style="list-style-type: none"> Malnutrition, hypoproteinemia, chronic anemia 	<ul style="list-style-type: none"> Imperfect hemostasis (hematoma and secondary infection end in a weak scar) Rough surgical manipulation with devitalization of muscles Inadequate closure or hurry in closure 	<ul style="list-style-type: none"> Postoperative chest infection or complications Vomiting Early convalescence Heavy work Pregnancy (abdominal distention)
<ul style="list-style-type: none"> Obesity and old age 	<ul style="list-style-type: none"> Long incision The use of drains for a long time 	<ul style="list-style-type: none"> Burst abdomen (partial burst) Secondary infection (weak scar)
<ul style="list-style-type: none"> General debilitating diseases [diabetes mellitus (DM), uremia, liver cirrhosis] Prolonged steroid therapy and immunosuppressive drugs 	<ul style="list-style-type: none"> Nerve injury with atrophy of muscles, e.g. ilioinguinal or iliohypogastric nerve after appendicectomy 	

Diagnosis

1. **Detailed history of primary operation:** Time, location, surgeon, indication, etc. and postoperative condition (sepsis, burst abdomen, stitch removal, chest infection, etc.).
2. **Clinical examination**
 - General clinical examination: Detection of straining factors and assessment of the general condition.
 - Local clinical examination: Assessment of the defect and the skin and musculature of the AAW.
3. **Investigations:** For detection of straining factors (e.g. chest X-ray) and evaluation of the general condition of the patient (e.g. anemia, diabetes, hypoproteinemia, etc.).

Spigelian Hernia

Definition

Herniation through the linea semilunaris (the outer border of the rectus abdominis muscle) at or just below the junction with the semicircular line of Douglas.

History

- **Age:** Mean age is 50 years (range 6–94 years) (**Maingot**).
- **Gender:** Females slightly > males (1.5:1).
- **Bilaterality:** It is usually unilateral (right > left, 1.5:1); bilateral in only 3%.
- **Symptoms:**
 1. **Lump** (above and parallel to the inguinal ligament).
 2. **Pain:** dragging, intermittent (complete or partial Richter's intestinal obstruction) or sharp and constant (strangulation).

Clinical Examination

- **Site:** A lump above and parallel to the inguinal ligament, mostly below the umbilicus (only 3% bulge above the umbilicus)
- **The lump** is soft and reducible. After reduction, a defect is felt and is usually tender
- It is liable to develop strangulation because of the rigid fascia around its neck
- Localized perforation into the sac—abdominal wall abscess or even a fistula.

Investigations

- **Plain X-ray or with contrast:** Bowel is shown outside the abdominal cavity
- **Ultrasound** (best)
- **CT scan** (expensive).

Differential Diagnosis

When incarcerated or irreducible, it may be confused with a lipoma, desmoid tumor, hematoma of the rectus sheath or even an appendicular abscess.

DISEASES OF THE UMBILICUS

Anatomy

- The normal level of the umbilicus is between L3 and L4 (highest point of iliac crest) or between L2 and L3; it varies with age, sex and degree of obesity
- Normally, it is placed almost equidistant along a line joining the tip of the xiphoid process with the top of the symphysis pubis
- The umbilicus is displaced upwards by a swelling arising from the pelvis or downwards by ascites (**Tanyols' sign**).

Classification

Pathology	Disease
<i>Inflammation</i>	<ol style="list-style-type: none"> 1. Omphalitis (inflammation of the umbilical stump) 2. Umbilical granuloma (raspberry tumor) 3. Umbilical dermatitis 4. Pilonidal sinus
<i>Fistulae</i>	<ol style="list-style-type: none"> A. Fecal fistula <ul style="list-style-type: none"> – Congenital: Patent vitellointestinal duct – Acquired: <ol style="list-style-type: none"> 1. Post-traumatic or postoperative 2. Tuberculous peritonitis 3. Neoplastic ulceration from the transverse colon B. Urinary fistula <ul style="list-style-type: none"> – Congenital: Patent urachus – Acquired: Traumatic or postoperative C. Biliary fistula
<i>Neoplasms</i>	<ol style="list-style-type: none"> A. Benign tumors <ol style="list-style-type: none"> 1. Papillomata and warts 2. Adenoma 3. Endometrioma B. Malignant tumors <ol style="list-style-type: none"> 1. Primary carcinoma 2. Secondary from carcinoma of stomach, colon and rectum, pancreas, ovary, uterus and breast
<i>Abdominal wall defects</i>	<ol style="list-style-type: none"> 1. Omphalocele 2. Hernia 3. Ectopia vesica extrophy of the urinary bladder (UB)
<i>Umbilical calculus</i>	Umbolith (sebaceous horn)
<i>As a manifestation of systemic disease</i>	<ol style="list-style-type: none"> 1. Eversion: Ascites 2. Caput medusa: Portal hypertension 3. Pigmentation: Acute pancreatitis (Cullin's sign) 4. Nodules: Metastatic (Sister Mary Joseph's nodule)

Congenital Diseases

Anomalies of the Vitellointestinal Tract

- Fecal fistula at the umbilicus (patent vitellointestinal duct)
- A polyp or bud of intestinal mucosa at the umbilicus
- Umbilical granuloma (raspberry tumor): It represents the umbilical end of the duct; it appears as a bright red granulomatous swelling causing persistent mucoid discharge that leads to umbilical dermatitis
- Enterocystoma: A cyst lying deep to the umbilicus attached with a fibrous cord between the AAW (umbilicus) and the ileum.
- A deep umbilical sinus.
- A Meckel's diverticulum is a fibrous band attached to the posterior aspect of the umbilicus and responsible for intestinal obstruction by volvulus or band obstruction.

Patent Urachal Remnant (Obliterated Allantois)

- Urinary ristula: A completely patent urachus results in a urinary fistula. A near obliterated urachal remnant causes a urinary fistula delayed in childhood or early in adult life due to urinary obstruction
- Urachal sinus (in adults)—an intermittent umbilical discharge
- Urachal cyst (in adults)—a very tender infected infra-umbilical swelling.

Abdominal Wall Defects

- Omphalocele: Failure of the umbilical defect to close (**Figure 7.7**).
- Umbilical hernia (**Figure 7.8**)
- Extrophy of the urinary bladder and other forms of development abnormality including malrotation.

Weeping Umbilicus

- The umbilicus fails to heal after falling of the cord causing a watery discharge
- It is treated by scraping of the columnar epithelium.



Fig. 7.7: Omphalocele

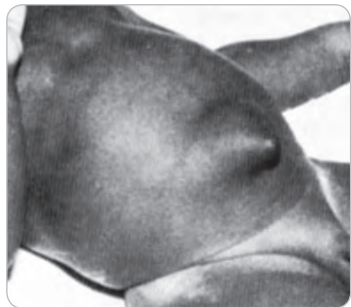


Fig. 7.8: Umbilical hernia

Vascular Remnants

- Left umbilical vein—ligamentum teres.
- Hypogastric artery of the fetus—obliterated hypogastric artery.
- Remnant of the artery of the VIT—fibrous cord between the umbilicus and the gut or mesentery.

Acquired Diseases

Paraumbilical Hernia

Discussed in detail in previous pages.

Inflammation (Omphalitis)

- In neonates (rare): Faulty technique when dealing with the umbilical cord at birth causes infection with *Staphylococcus aureus* and *H. streptococcus* resulting in suppuration and cellulitis
- In adults (more common): Seropurulent, often foul smelling discharge due to lack of cleanliness or FB.

Dilated Veins

- *Caput medusa*: in patients with liver cirrhosis and severe portal hypertension. It should be differentiated from dilated veins due to obstruction of the inferior vena cava (IVC) by testing the direction of filling below the umbilicus. It is from below upwards in vena caval obstruction and from above down (away from umbilicus) in portal hypertension.
- Cruveilhier-Baumgarten syndrome: In portal hypertension, a mass of veins may sometimes form at the umbilicus and resemble a swelling.

Fistula (Discharge)

- Etiology: It may be post-traumatic, postoperative, tuberculous or neoplastic
- Types
 - a. Fecal fistula
 - b. Urinary fistula
 - c. Biliary fistula.
- The causes of discharge from the umbilicus may be:
 1. Congenital: Intestinal fistula, patent urachus, biliary fistula.
 2. Acquired: Umbilical granuloma, dermatitis (intertrigo), ompholith (umbilical concretion), fistula (intestinal), secondary carcinoma, endometriosis (Figure 7.9).

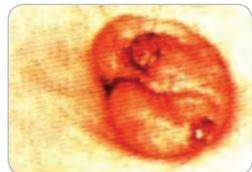


Fig. 7.9: Umbilical Endometriosis

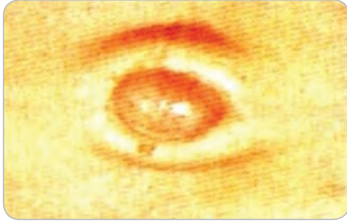


Fig. 7.10: Umbilical adenoma



Fig. 7.11: Umbilical pigmentation

Umbolith

- Sebaceous material may collect in the umbilicus and then inspissate and form a sebaceous horn or umbolith.
- These secretions may be easily lifted out intact and this would be done preoperatively, while the abdomen is being shaved and prepared for operation.

New Growth

Tumor, warts, papillomata. Tumors may be:

- Benign: Adenoma (**Figure 7.10**).
- Malignant:
 1. Primary, e.g. squamous cell carcinoma (treated with wide local excision and block dissection of secondary LNs).
 2. Secondary (by transcelomic spread, usually from an intra-abdominal primary such as stomach or ovary).

Pigmentation

- Pigmentations around the umbilicus may occur in some cases of acute hemorrhagic (necrotizing) pancreatitis (**Cullen's sign**) (**Figure 7.11**).
- Pigmented skin lesions (**Bowen's disease**) may also occur at the umbilicus.
- A blue tinge caused by dilated tortuous veins is **caput medusae**, which may occur in case of portal hypertension.