

Hemodynamic Disorder (Oedema)



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OEDEMA

- **Definition**
- Abnormal accumulation of fluid in the intercellular tissue spaces or body cavities
 - Localized : Due to obstruction of venous outflow – leg
 - Generalized : Chronic venous Congestion or heart failure

Terms used to describe oedema

- **Anasarca**: Generalized subcutaneous oedema
- **Ascites**: Fluid in peritoneal cavity
- **Hydrothorax**; Edematous fluid in thorax
- **Hydropericardium**: Edematous fluid in pericardium

Types of oedema

Oedema is of two types

- Inflammatory oedema
- Non-inflammatory odema

CAUSES OF OEDEMA

- Decreased plasma osmotic pressure
- Increased hydrostatic pressure
- Increased permeability of vascular endothelium
- Lymphatic obstruction
- Sodium retention

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The most common causes of generalized edema:

- *Heart failure*
- *Cirrhosis*
- *Nephrotic syndrome and other forms of renal disease*
- *Premenstrual edema and pregnancy*

Clinical features of Pulmonary edema

- Shortness of breath and orthopnea.
- Chest pain in case of MI
- O/E:
 - tachypneic, diaphoretic patient with wet rales and possibly a diastolic gallop (S3) and heart murmurs.
- The diagnosis of pulmonary edema should be confirmed by radiologic studies.

Right Heart Failure

- Increased venous pressure behind the right side of the heart → increased capillary hydrostatic pressure
 - *Congested jugular veins*
 - *Enlarged & tender liver*
 - *Peripheral edema → Anasarca*



Cirrhosis

- **Increased venous pressure** below the diseased liver
→ Ascites → edema in the lower extremities.
- **JVP is usually reduced or normal, not elevated as in heart failure.**
 - Can be raised if tense ascites → upward pressure on the diaphragm can increase the intrathoracic pressure
- **Signs of portal hypertension**
 - (distended abdominal wall veins & splenomegaly)

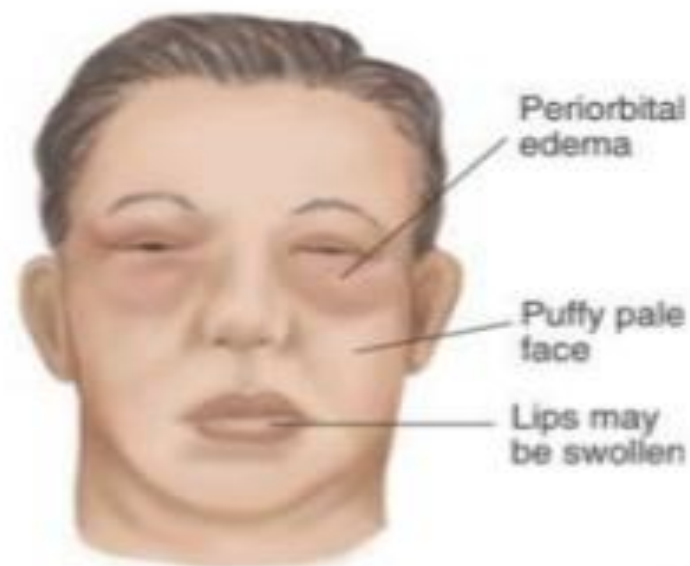


Nephrotic syndrome

- **Heavy proteinuria (> 3.0 g/day)**
- **Hypoalbuminemia**
- **Hyperlipidemia**
- **Peripheral edema**

Edema in Nephrotic syndrome

- **2 factors:**
 1. sodium retention due to underlying renal disease
 2. diminished transcapillary oncotic pressure gradient
- Typically- periorbital and peripheral edema, occasionally also ascites.
- The central venous pressure is usually ***normal to high-normal*** in the nephrotic syndrome.



Edema



Pitting edema



Non-pitting edema

	TRANSUDATE	EXUDATE
COLOR	Clear, water-like, or pale yellow of plasma	Cloudy, white, yellow or red
CONSISTENCY	Thin and watery, no tissue fragments	Thick and creamy, contains tissue fragments
ODOR	None	May have an odor
pH	Alkaline	Acid
SPECIFIC GRAVITY	1.015 or lower	1.018 or higher
PROTEIN CONTENT	Low, less than 3%	High, more than 4%
CELL COUNT	Low; none or few WBC and RBC	High; many WBC and RBC
ENZYME CONTENT	Low	High
BACTERIA	None	May be present
INFLAMMATION	None present	Associated with Inflammation