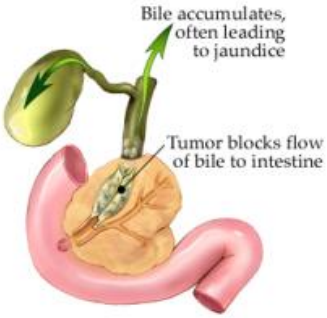
Unit I – Problem 9 – Pathology: Effects of Tumor On The Host

- **Effects of tumors on the host can be:**
  - **Local effects:**



    - ✓ Effects due to location and size of the tumor:
      - ❖ Pituitary adenomas compress the normal pituitary gland resulting in hypopituitarism (reduced secretion of pituitary hormones).
      - ❖ Bile duct tumors result in obstructive jaundice.
      - ❖ Renal artery leiomyoma results in hypertension.
    - ✓ Effects due to ulceration through surface epithelium:
      - ❖ *Gastrointestinal tumors results in bleeding in the form of:*
        - ➢ Melena (black stool due to the presence of blood).
        - ➢ Hematemesis (blood in the vomit).
      - ❖ *Lung cancer:*
        - ➢ Hemoptysis (coughing blood).
      - ❖ *Cancer of urinary bladder and ureter:*
        - ➢ Hematuria (blood in urine).
  - **Systemic effects:**
    - ✓ Secreted products: hormone synthesis
      - ❖ *Pancreas*: insulin-secreting tumors result in hypoglycemia (reduced blood glucose level).
      - ❖ *Adrenal cortical tumors (tumors in the cortex of adrenal glands):*
        - ➢ Secretion of corticosteroids or aldosterone.
        - ➢ More common with well-differentiated benign tumors.
    - ✓ Cancer cachexia (wasting of muscles):

      - ❖ *Definition*: it is a complex syndrome which includes the following:
        - ➢ Weight loss.
        - ➢ Lipolysis.
        - ➢ Loss of muscle and visceral protein.
        - ➢ Anorexia.
        - ➢ Chronic nausea.
        - ➢ Anemia.
        - ➢ Weakness.
      - ❖ *Pathogenesis*: tumor cells and macrophages which surround them increase TNF thus basal metabolic rate remains high despite reduced food intake.
    - ✓ Paraneoplastic syndromes:
      - ❖ *Definition*: these are clinical syndrome involving non-metastatic systemic effects that accompany malignant diseases.
      - ❖ *They are mediated by:*
        - ➢ Humoral factors (hormones or cytokines) secreted by tumor cells.
        - ➢ Immune response against the tumor.
      - ❖ *Paraneoplastic syndromes might be:*
        - ➢ Earliest manifestation of an occult tumor.

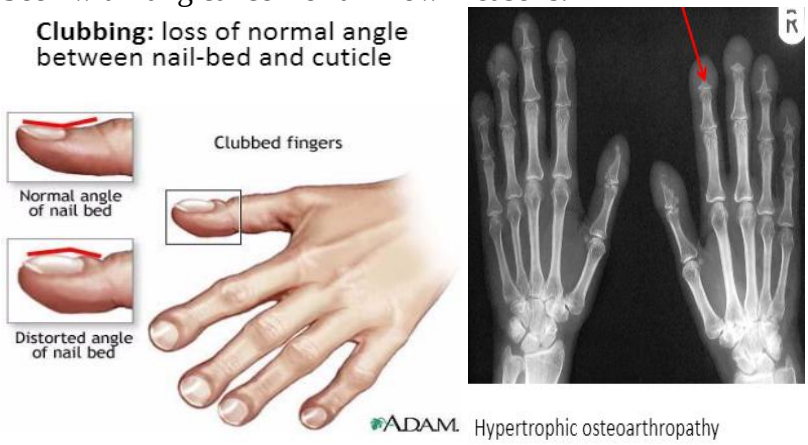
- Clinically significant problems.
- Confused with metastatic disease.
- Symptoms may be endocrine, neuromuscular, musculoskeletal, cardiovascular, cutaneous, hematologic, gastrointestinal, renal or miscellaneous.

❖ *Hypercalcemia (increased calcium level in the blood): due to*
- Para-Thyroid Hormone related Protein (PTHrP): this is secreted in renal cell carcinoma, breast cancer and T-cell leukemia/ lymphomas.
- Osteoclast activating factor: secreted in multiple myeloma (MM).

❖ *Production of hormones/ bioactive substances:*
- Lung cancer:
  - ACTH (Adrenocorticotropic Hormone): Cushing syndrome.
  - ADH (Antidiuretic Hormone): hyponatremia.
  - PTH (Parathyroid Hormone): hypercalcemia.
  - Miscellaneous: hCG (human Chorionic Gonadotropin) and serotonin.

❖ *Hypercoagulability:*
- Thrombosis is seen with pancreatic, mucin-secreting GIT and lung cancers.
- Non-bacterial thrombotic endocarditis: platelet-fibrin thrombi on cardiac valves.

❖ *Clubbing of fingers; hypertrophic osteoarthropathy:*
- Seen with lung cancer for unknown reasons.



❖ *Dermatologic disorders:*
- Acanthosis nigricans:
  - Brown-black poorly defined, velvety hyperpigmentation of the skin.
  - Caused by secretion of EGF that stimulates epidermal keratinocytes and dermal fibroblast proliferation.
  - Seen with gastric, lung and uterine cancers.

- Dermatomyositis:
  - Symmetric, proximal muscle weakness.
  - Seen with lung and breast cancers.