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Inflammation I - Notes

Tuesday, April 15, 2008
1:00 PM

- **Inflammatory Response**
  - **Vascular response** – vasodilation, protein-rich transudate esacpes, protein-poor exudate follows, increase in RBC concentration in blood, watch out for hypovolemic shock
  - **Cellular response** – leukocyte pavementing & diapedesis, chemotaxis, phagocytosis
    - **Timeline**: PMNs (1-2 days), then macrophages (3 days), then later fibroblasts (5 days – 2 weeks) --> lay down fibrin & vessels
- **White Blood Cells**
  - **Granulocytes** – include neutrophils (PMNs), eosinophils, basophils
    - PMNs - lobulated nucleus
    - Macrophages - round, bean shaped nucleus; stuff in cytoplasm
  - **Monocytes** – activate to form macrophages
  - **Lymphocytes** – T cells, B cells (T & B have huge "naked" nucleus), plasma cells (eccentric nucleus & "hof")
- **Margination:** Occurs when PMNs stick to vessel wall and **diapedesis** to site of injury --> can see surrounding vessel walls
- **Exudate**
  - **Exudate** –inflammatory extravascular fluid possibly having plasma proteins, leukocytes, cell derbis, H_2O
  - **Non-cellular Exudates** – Serous & Fibrinous
    - **Serous** – occurs in **noninfectious setting**, no cells, fluid has protein. **Ex: blister, alveolar fluid**
    - **Fibrinous** – fibrogen escapes from venules, forms **fibrin** (clot mesh), detect as **heart/pleural rub**
      - Seen as fibrin on pleural or serosal (outer) surface, can hear heart rubbing
  - **Cellular Exudates** – Purulent, Suppurative, Phlegmon
    - **Purulent** – PMNs streaming through tissue **without destruction;** tissue may appear spread apart
      - ***Examples***: **purulent pneumonia**, purulent meningitis, **acute appendicitis**
    - **Suppurative** (pus) – PMNs streaming through tissue **with destruction** (liquefactive necrosis!)
      - Localized suppuration = **abscess** (liquefactive necrosis)
      - Due to infection of some sort, usually
      - Staph infection --> polyp --> abscess w/ pus
      - ***Examples:*** **appendicitis** with **necrosis and suppuration** – can't recognize tissue
      - Also **myocardial infarction** – see coagulative necrosis with encroaching suppurative
    - **Cellulitis/Phelgmonous** – diffuse streaming of PMNs through tissue (type of purulence)
      - Occurs on **skin** and **subcutaneous tissue**, example is **bacterial infection spreading**
      - **Need clinical history and physical exam**
  - **Mixed Exudates**
    - **Fibrinopurulent** – neutrophils and fibrin; **example – leaky abdomen & peritonitis**
    - **Mucopurlent** – neutrophils and mucus *only on mucous membranes*
      - **Example – cystic fibrosis** of respiratory tract
      - Squamous cell carcinoma --> dilated bronchus fills w/ mucopurulent exudate
    - **Pseudomembranous** – fibrinopurulent "membrane" adherent to partially necrotic tissues
      - *Only on mucous membranes!*
      - **Example – *Pseudomembranous colitis*** – mucus diarrhea, membrane rubs off, bleeding
        - Extended antibiotic therapy --> C. difficile takes over --> colitis
        - Treat w/ vancomycin or metronidazole
- **PMNs vs. Lymphocytes (seen from lower power, not histo like view)**
  - **PMNs** are **fragmented, smaller,** more **irregular shape**
  - **Lymphocytes** are **larger**, more **regular shape**
- **Granulomatous Inflammation (Granuloma)**
  - Injury --> acute inflammation --> chronic inflammation --> mature granuloma --> epithielioid (modified macrophages) granuloma --> complex granuloma
  - A **chronic inflammation** formed by **undigested material**
  - Often involves **TB (caseating)** granuloma**, foreign body** granuloma**, lipogranuloma**
    - Caseating has **no clear center**, foreign body has an obvious central body (maybe a hair)
  - Surrounded by **macrophages and GIANT CELLS**
  - Can 1) persist forever, 2) resolve leaving scar/cavity, dystrophic calcification