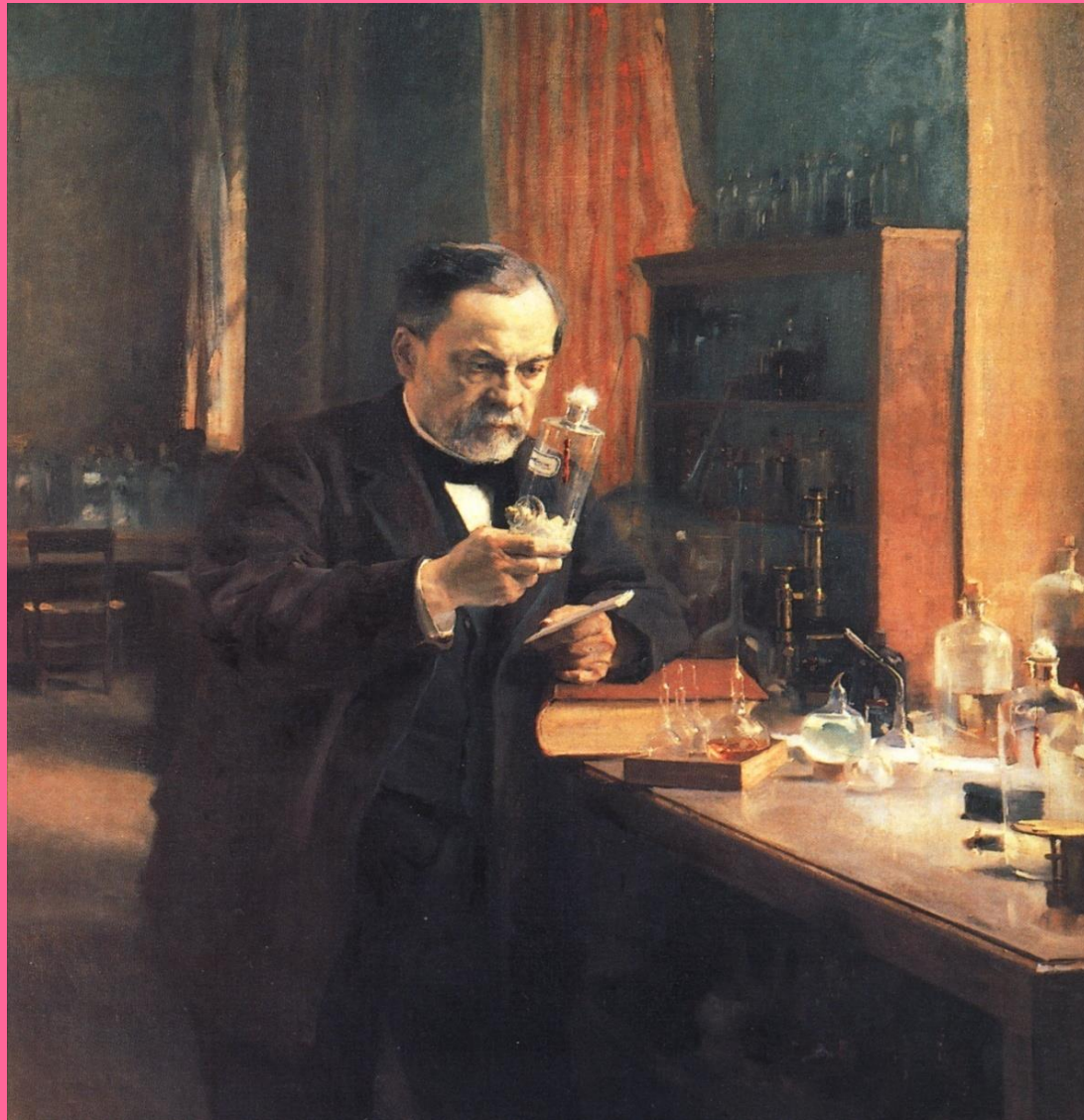


LECTURE 8



EXUDATIVE INFLAMMATION

PURULENT INFLAMMATION

PUS, PYON, EXSUDATUM PURULENTUM - *A MIXTURE OF NEUTROPHILS, MICROORGANISMS, THEIR TOXINS, AND NECROTIC TISSUE*

APPEARANCE OF THE PUS:

WATERY PUS, LOOSE, GREENISH – STREPTOCOCCAL INFECTION

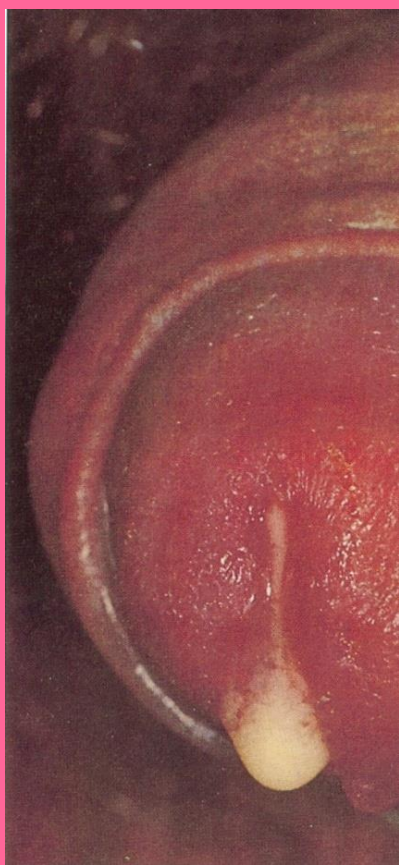
DENSE PUS, YELLOWISH – STAPHYLOCOCCUS AUREUS INFECTION („*PUS BONUM, PURUM ET LAUDABILE*”)

DENSE PUS WHITISH – STAPHYLOCOCCAL INFECTION

BLUE PUS – BACILLUS INFECTION

EXUDATIVE INFLAMMATION

SUPERFICIAL PURULENT INFLAMMATION



**GONOCOCCAL INFECTION OF
URETHRA AND VULVA
(URETHRITIS ET VULVITIS
PURULENTA GONOCOCCICA)**

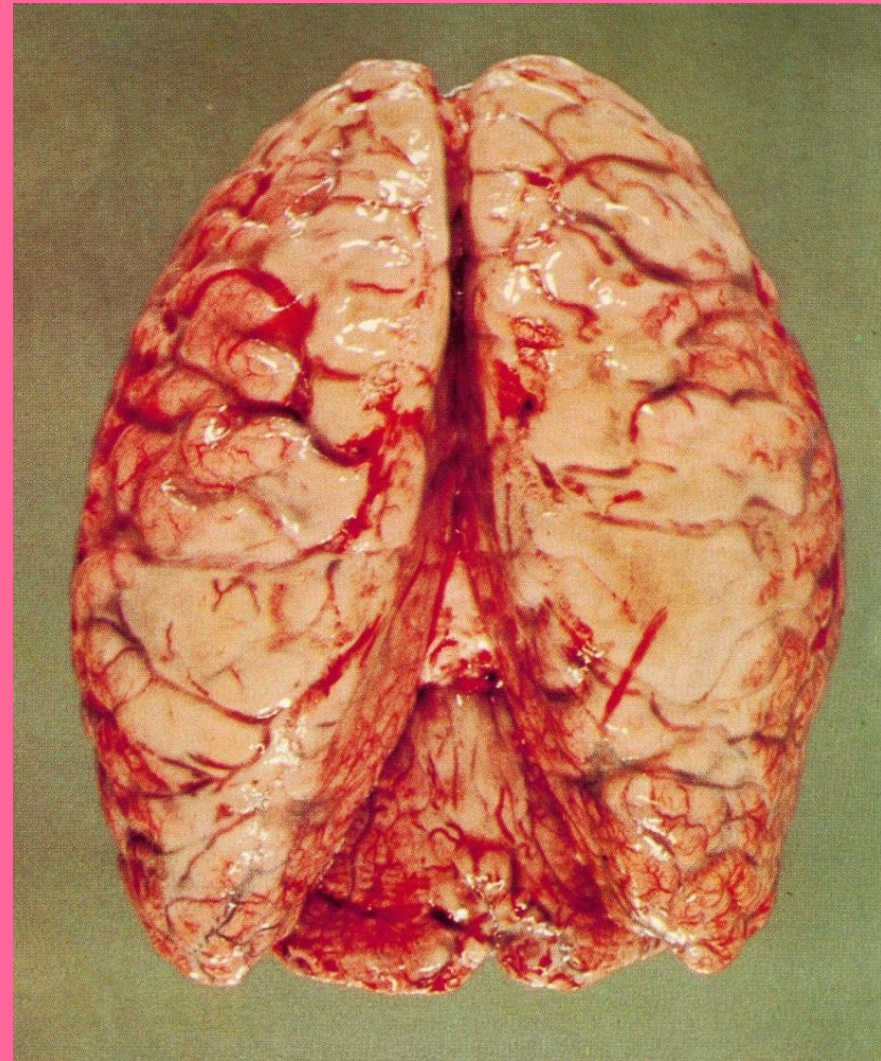
**CONJUNCTIVITIS
(CONIUNCTIVITIS
PURULENTA
GONOCOCCICA)**

EXUDATIVE INFLAMMATION

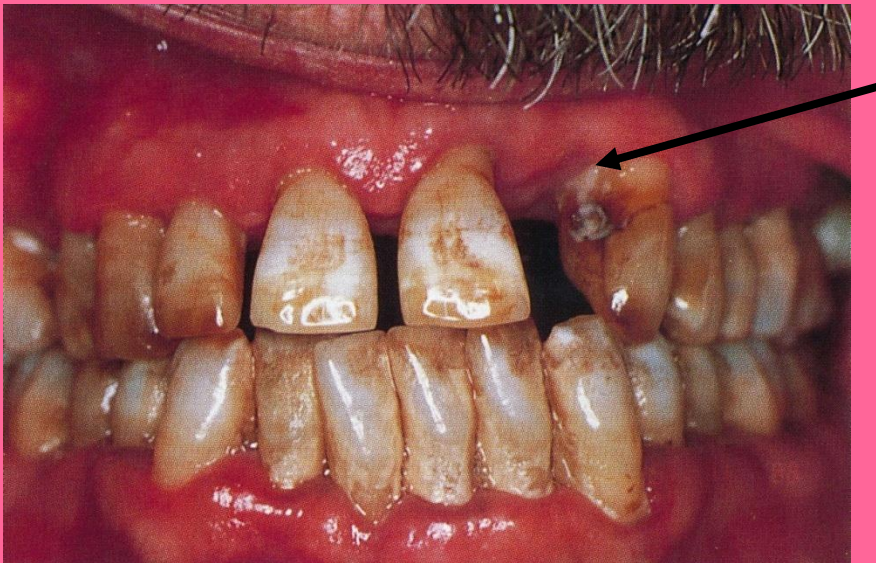
SUPERFICIAL PURULENT INFLAMMATION



GALL BLADDER EMPYEMA



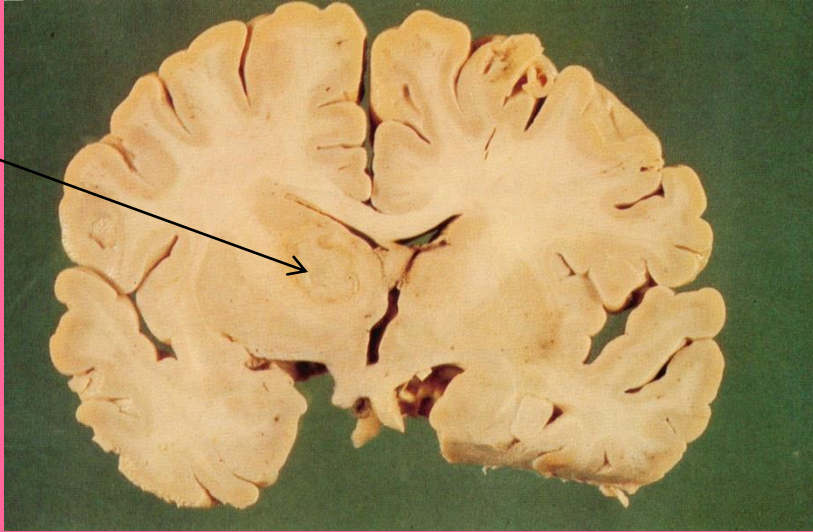
**PURULENT
LEPTOMENINGITIS**



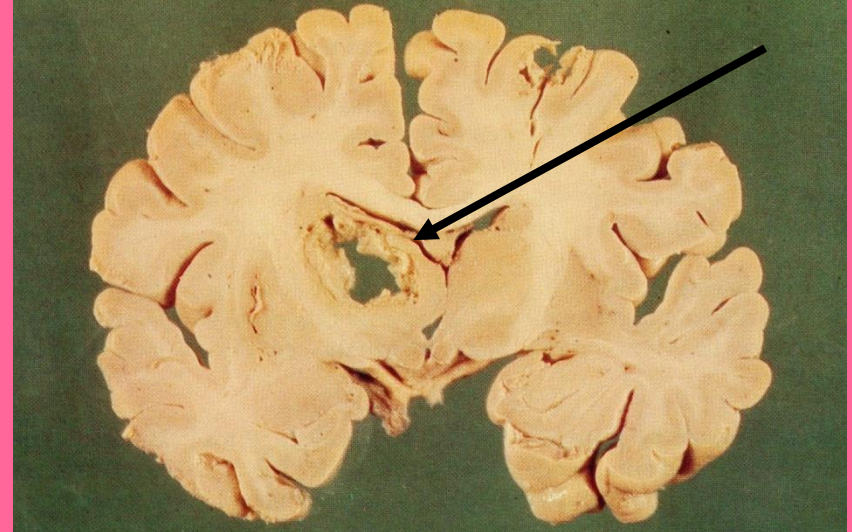
PARODONTOSIS (ALVEOLAR PYORRHOEA)

EXUDATIVE INFLAMMATION

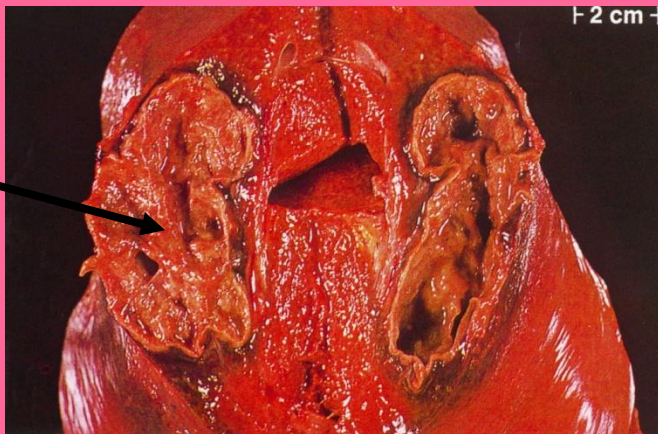
PROFOUND PURULENT INFLAMMATION



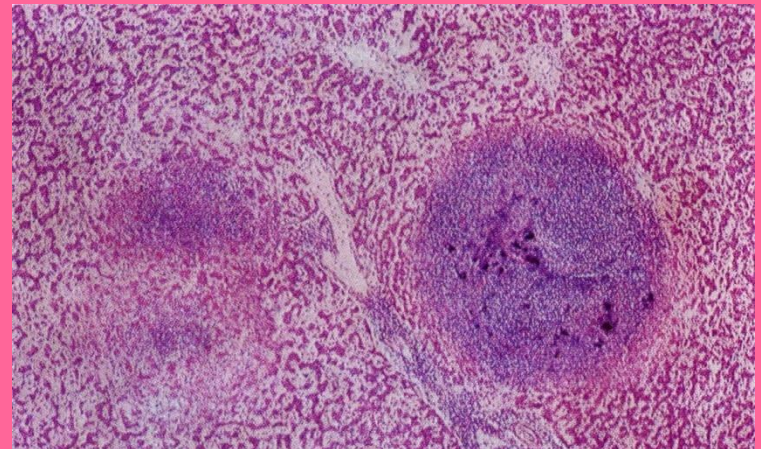
ACUTE ABSCESS OF BRAIN



CHRONIC ABSCESS OF BRAIN



HEPATIC ABSCESS



HEPATIC ABSCESS (MICROSCOPIC)

EXUDATIVE INFLAMMATION

PROFOUND PURULENT INFLAMMATION



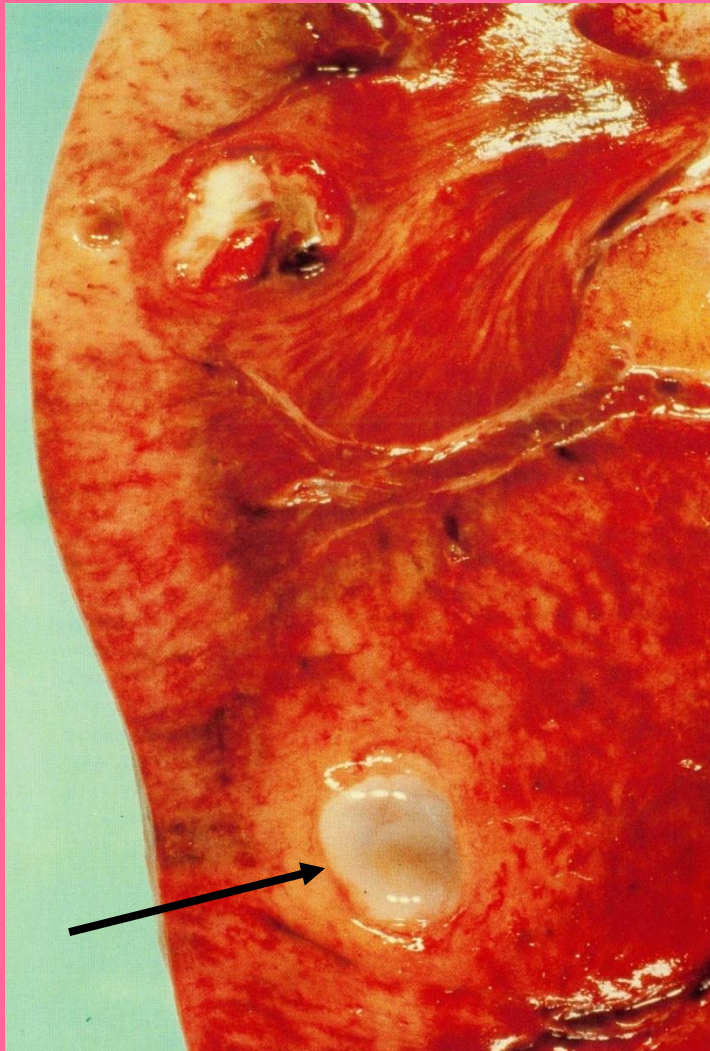
ABSCESS IN THE LUNG



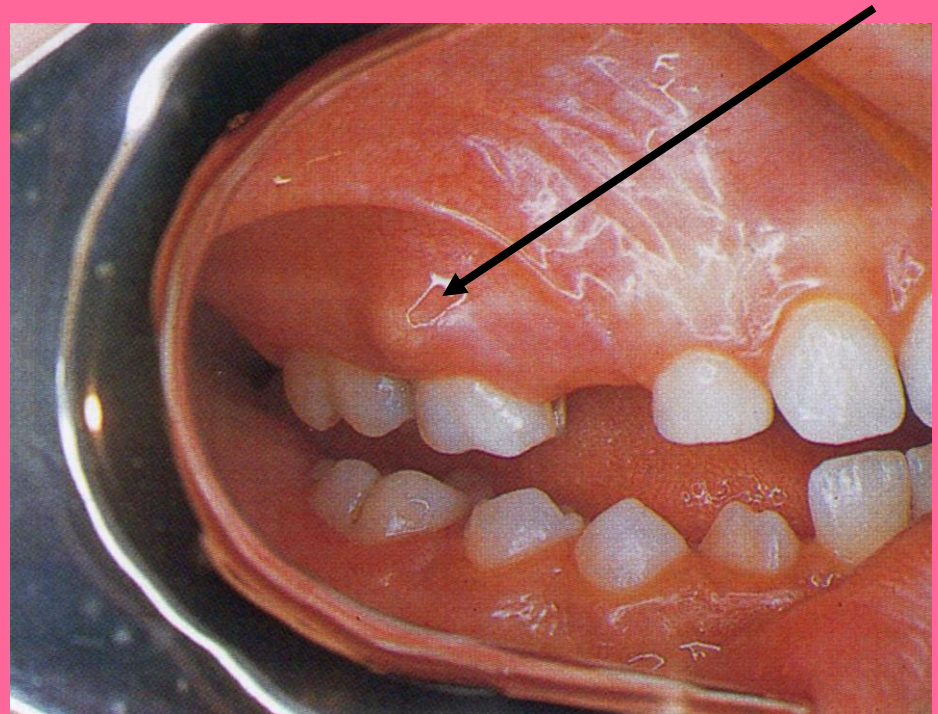
**ABSCESS IN THE LUNG AND FIBRINOUS
PLEURITIS**

EXUDATIVE INFLAMMATION

PROFOUND PURULENT INFLAMMATION



RENAL ABSCESS



PERIAPICAL ABSCESS

ABSCESS

PROFOUND PURULENT INFLAMMATION



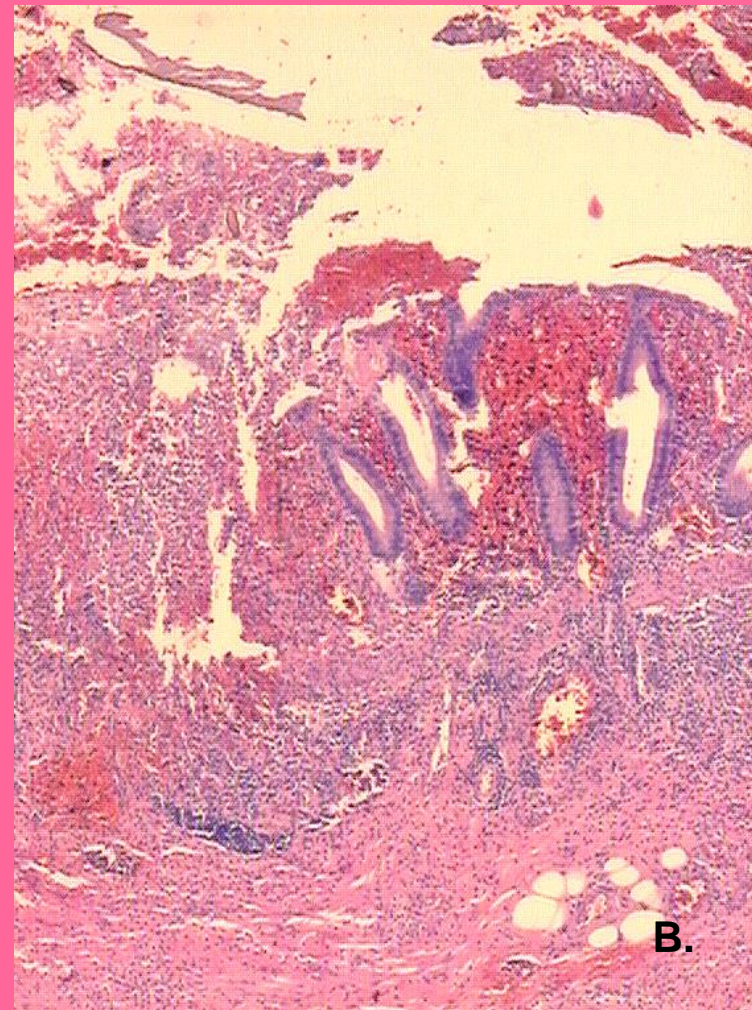
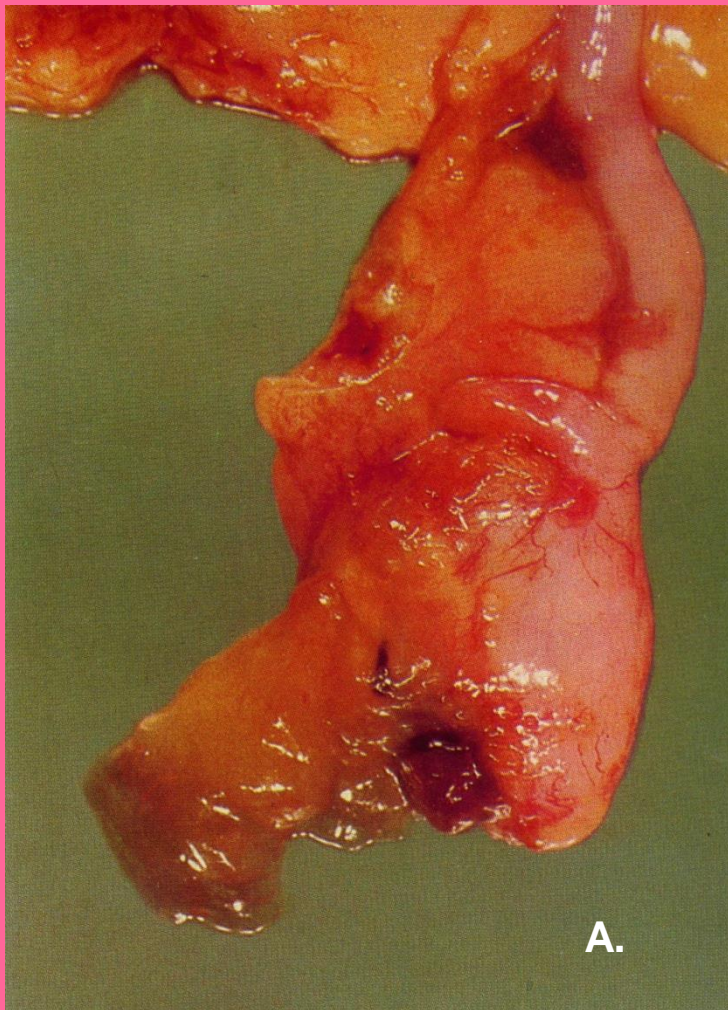
MASTOIDITIS WITH ABSCESS

PROFOUND PURULENT INFLAMMATION



EXUDATIVE INFLAMMATION

PROFOUND PURULENT INFLAMMATION



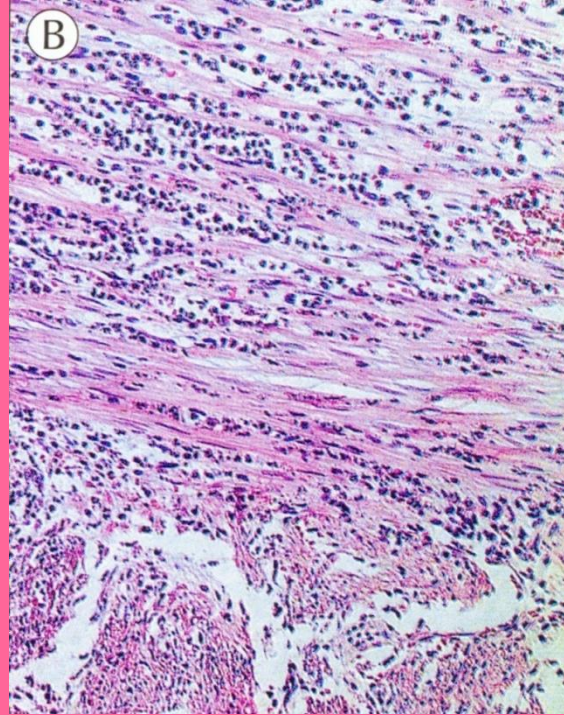
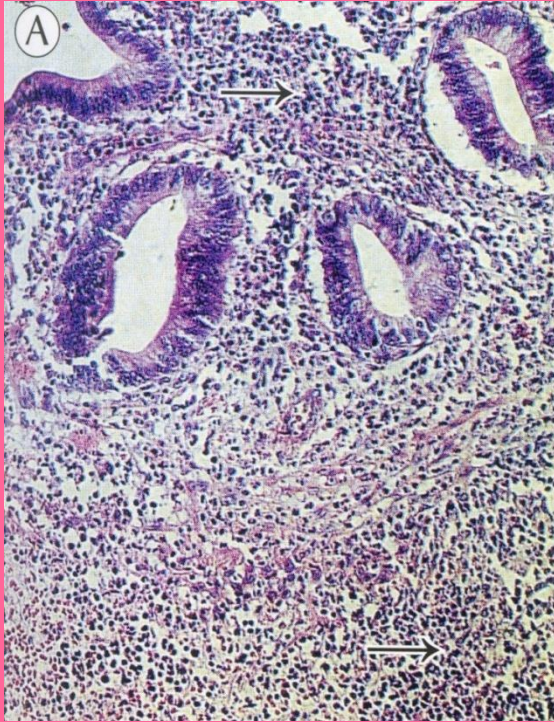
PHLEGMONOUS PERFORATIVE APPENDICITIS

A. MACROSCOPIC

B. MICROSCOPIC

EXUDATIVE INFLAMMATION

PROFOUND PURULENT INFLAMMATION



PHLEGMONOUS APPENDICITIS
(APPENDICITIS PHLEGMONOSA)
(NEUTROPHILS AND FIBROBLASTS; RIGHT)

EXUDATIVE INFLAMMATION
PROFOUND PURULENT INFLAMMATION



**BOIL/FURUNCLE (*Furunculus*) – SINGLE LESION
LOCATED ON e.g. NAPE
CARBUNCLE – AGGREGATES OF CONNECTED
FURUNCLES**

EXUDATIVE INFLAMMATION
PROFOUND PURULENT INFLAMMATION



CARBUNCLE (*Carbunculus*)

- **ACCUMULATION OF INFLAMED TUBERCLES WITH NECROTIC PLAQUES.** Deep form of bacterial folliculitis involving several hair follicles, often due to *Staphylococcus aureus*, which can be cultured from skin

EXUDATIVE INFLAMMATION

PROFOUND PURULENT INFLAMMATION



CARBUNCLE

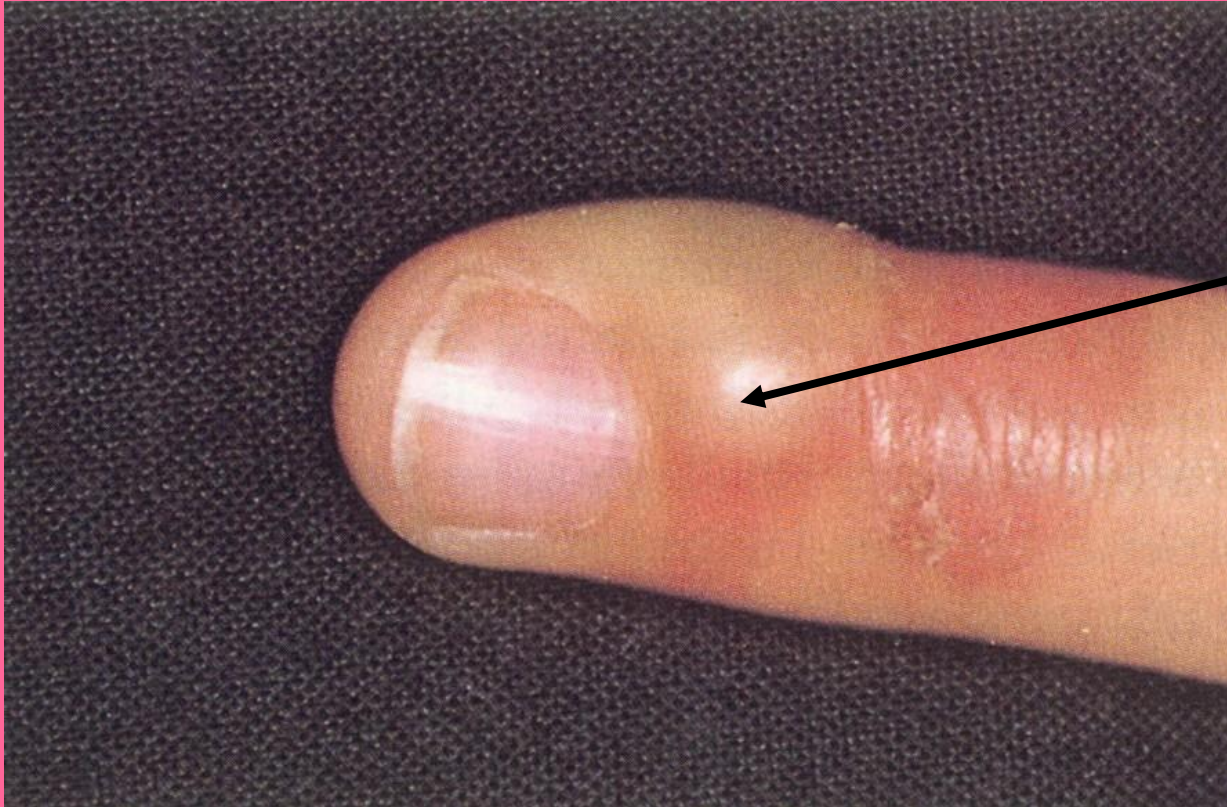
**SPECIFICALLY DANGEROUS
LOCALISATION BECAUSE OF THE
POSSIBILITY OF TRANSMISSION
TO THE MAIN VENOUS SINUSES IN
THE ANTERIOR CRANIAL FOSSA,
MENINGES AND BRAIN**



CARBUNCLE

MANY, DISSEMINATED FURUNCLES

EXUDATIVE INFLAMMATION
PROFOUND PURULENT INFLAMMATION

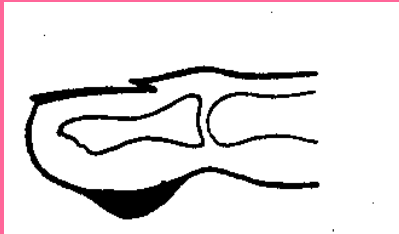


PANARIS – PARONYCHIA – FELON

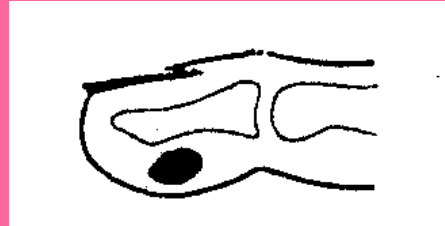
PURULENT PROCESS SPREADING FROM THE NAIL BED

DIFFERENT FORMS OF PANARIS

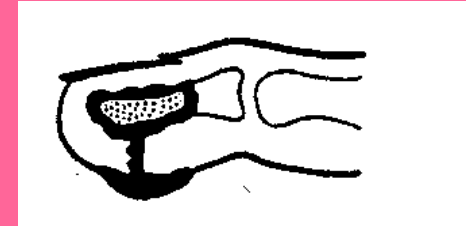
(ACCORD. Z. Düben)



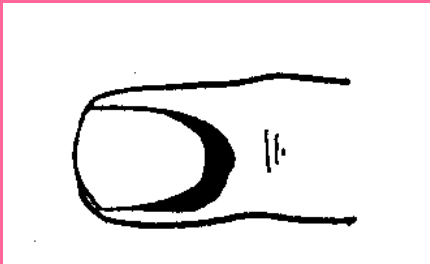
Cutaneous felon
(*panaritium cutaneum*)



Subcutaneous felon
(*panaritium subcutaneum*)



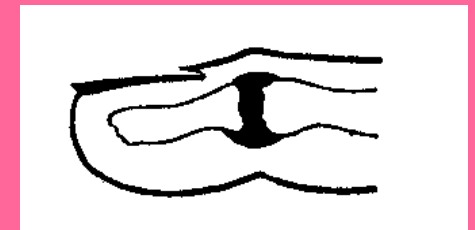
Bone felon
(*panaritium osseum*)



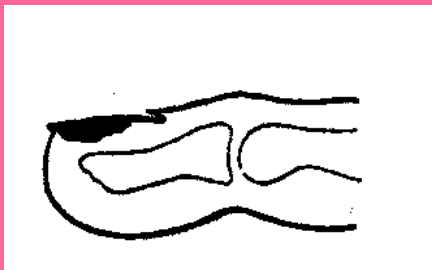
Felon
(paronychia)



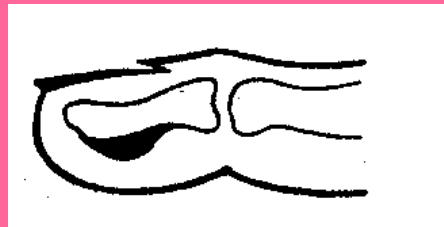
Felon
„the pin from the collar”



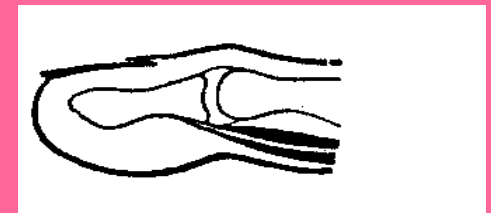
Articular felon
(*panaritium articulare*)



Subungual felon
(*panaritium subunguale*)



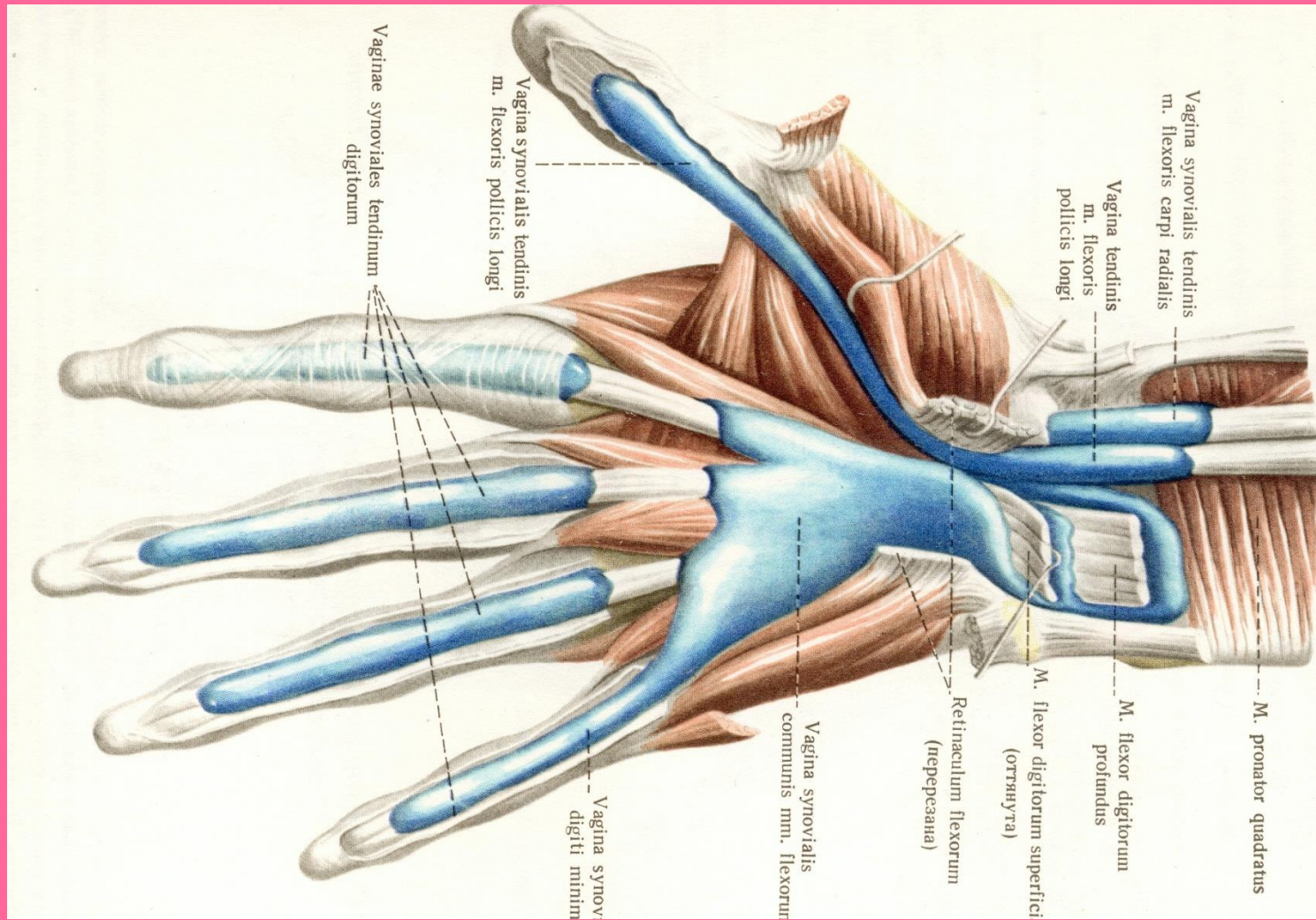
Periosteal felon



Tendinous felon
(*panaritium tendinosum*)

EXUDATIVE INFLAMMATION

PROFOUND PURULENT INFLAMMATION



THE ANATOMIC STRUCTURE OF THE HAND ENABLES SPREADING OF INFLAMMATION ALONG TENDON SHEATHS AND RESULTS IN PHLEGMON

EXUDATIVE INFLAMMATION

PURULENT INFLAMMATION



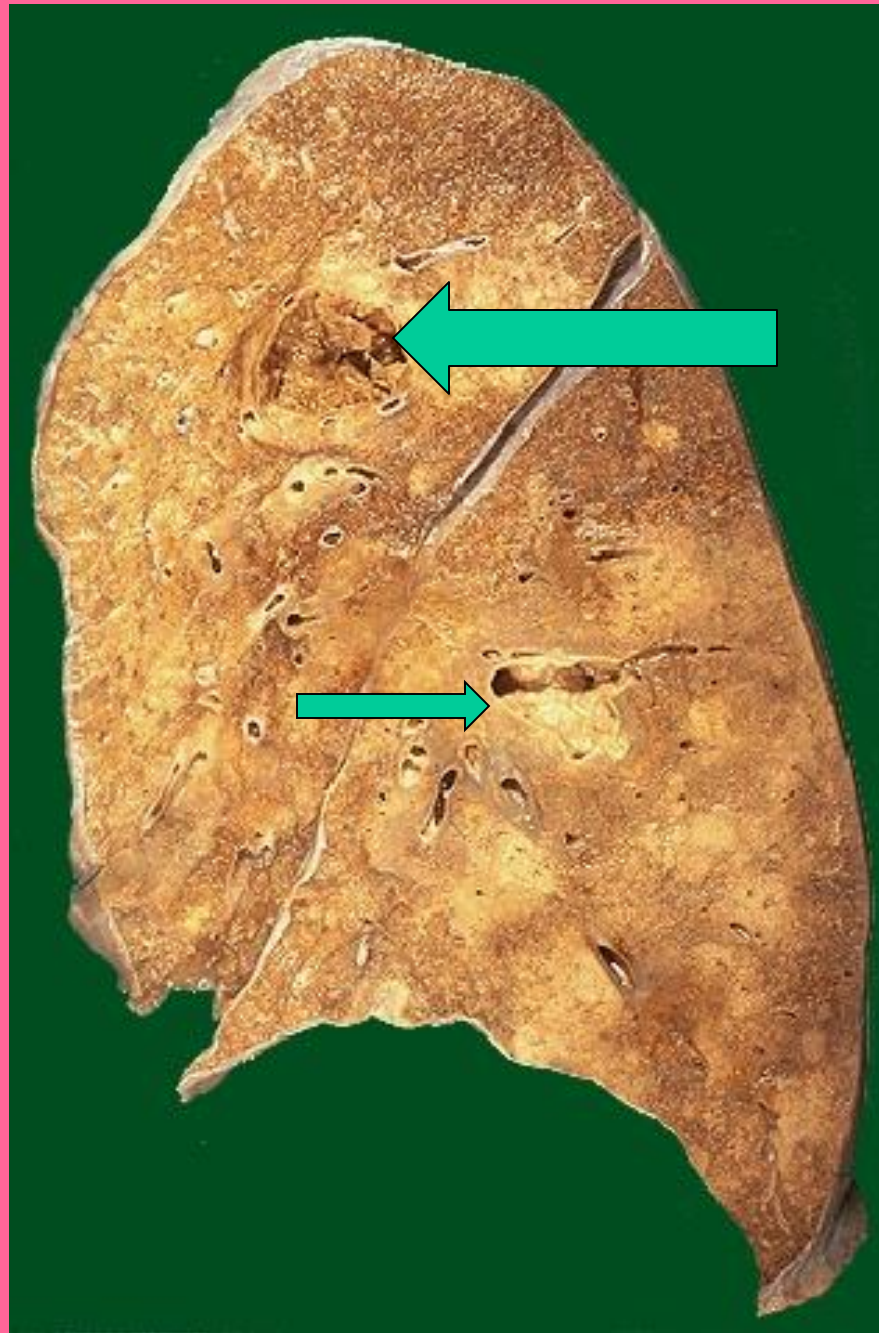
SEPTICOPYAEMIA. LYMPHANGITIS.

**THE DISSEMINATION OF INFLAMMATION ALONG
THE LYMPHATICS WITH REDDENING OF SKIN**

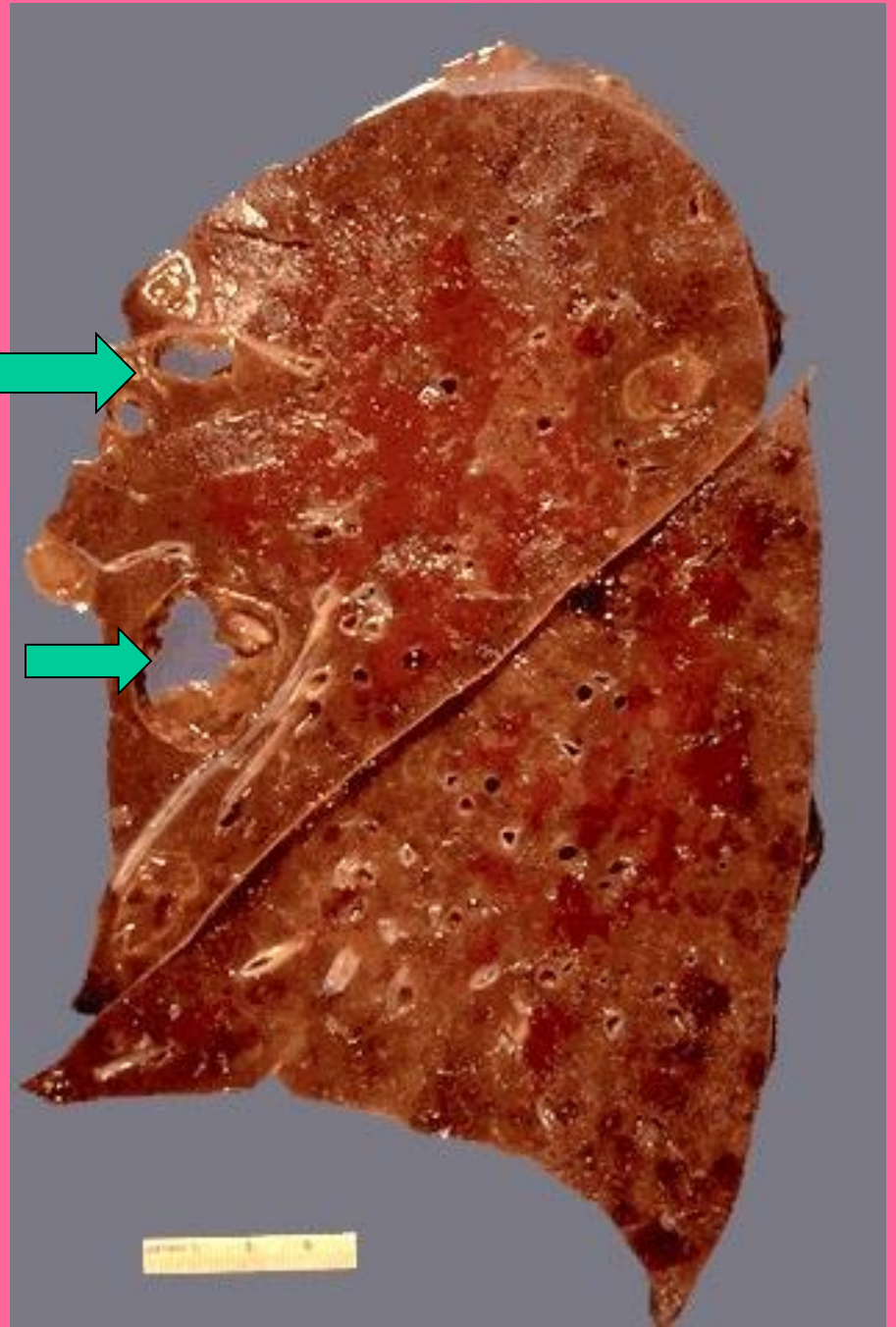
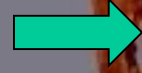
Lung Abscess

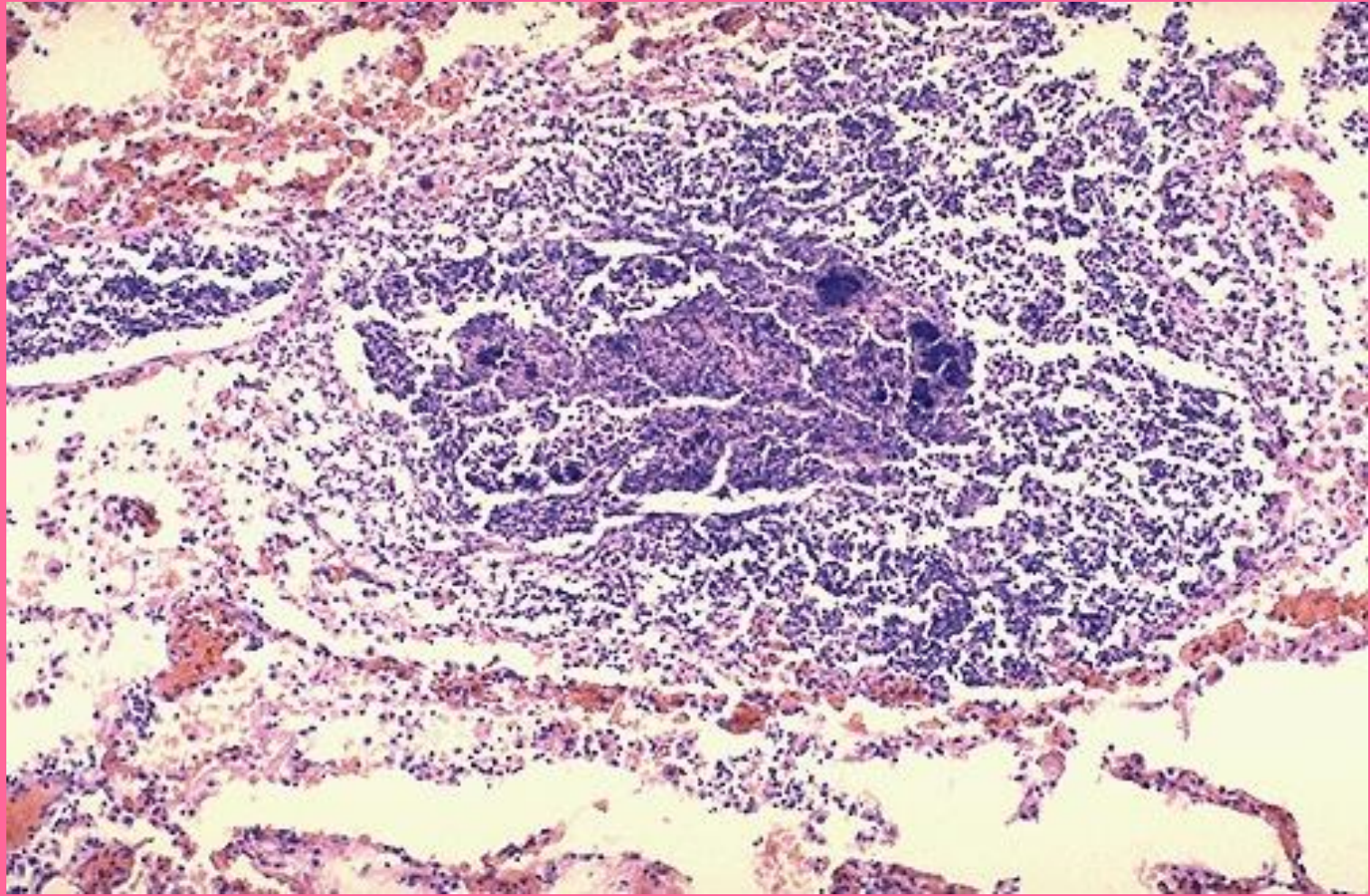
- **Air fluid level present if there is communication with air passages**
- **Symptoms: cough, fever, copious foul smelling sputum, fever, chest pain, weight loss, clubbing of digits**
- **10% of cases are associated with underlying carcinoma**
- **May extend into pleural cavity and create septic emboli, causing meningitis or brain abscess; serve as nidus for fungal overgrowth (Mucor, aspergillus); may spread elsewhere in lung**

lung abscesses

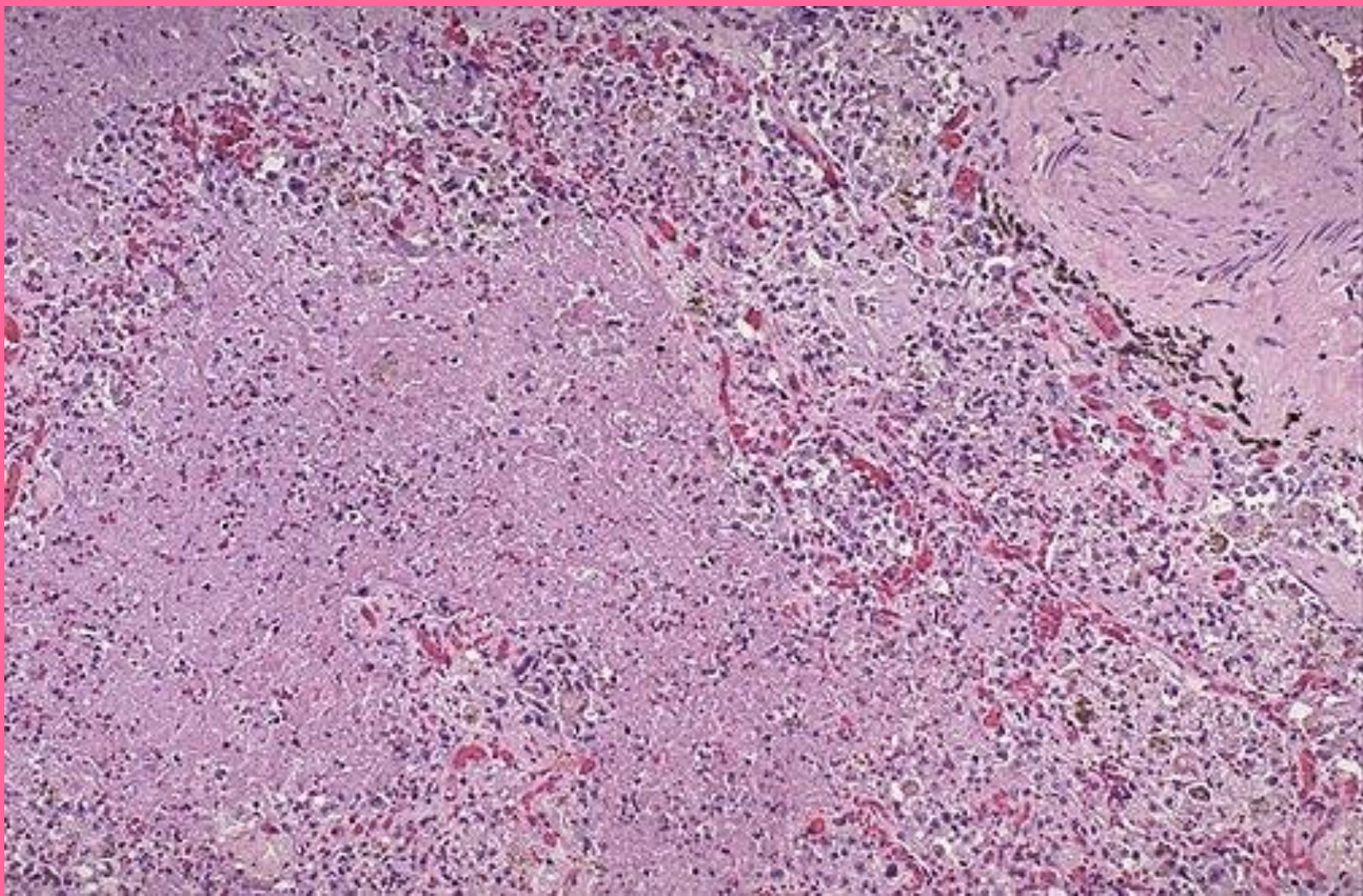


Seen here are lung abscesses grossly in which the purulent exudate has drained following sectioning to reveal the abscess cavities. Abscesses can be a source for septicemia and are difficult to treat.





This more focal abscess containing a neutrophilic exudate as well as dark blue bacterial colonies suggests aspiration or hematogenous spread of infection to the lung. Aspirated material from the oral-pharyngeal region contains bacterial flora. Hematogenous spread of infection to lungs could occur from septicemia or from infective endocarditis in the right heart.



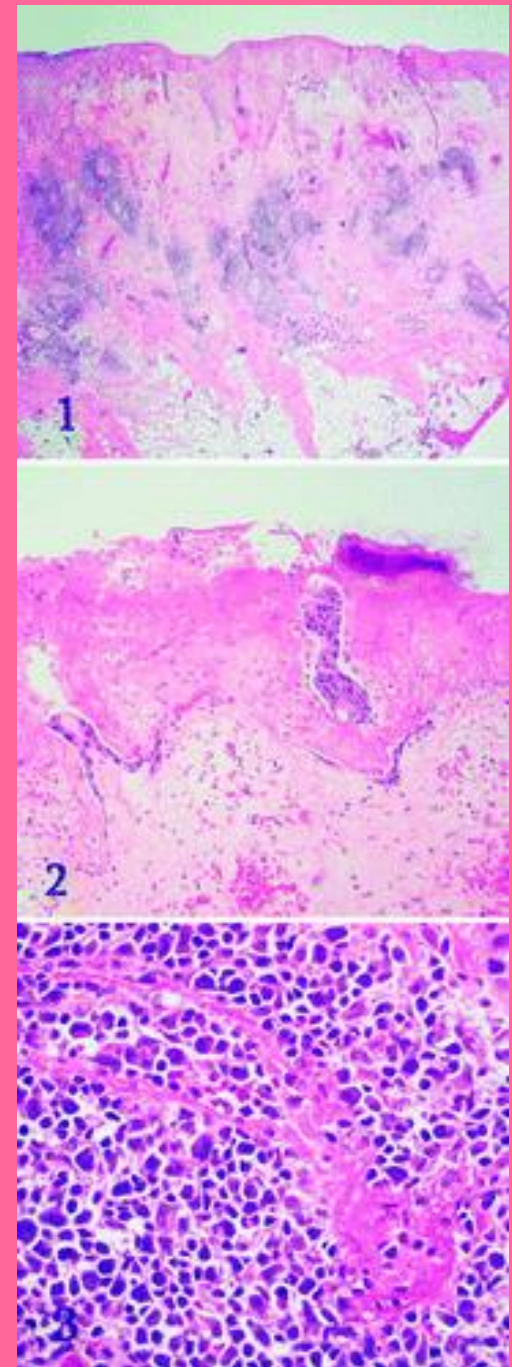
This is a microscopic appearance of chronic abscessing inflammation with large areas of pink necrotic tissue present on the left that are bordered by granulation tissue with numerous prominent capillaries filled with blood.

ANTHRAX

- **"Coal" in Greek; refers to black coloration of skin eschar**
- **2,000 cases per year worldwide - 95% are skin infections**
- **Causes cutaneous, pulmonary or gastrointestinal symptoms**
- **Cutaneous anthrax is marked by a boil-like lesion that eventually forms an ulcer with a black center (eschar)**

ANTHRAX

1. coagulative necrosis of superficial epidermis and dermis, edema of underlying viable dermis, frequent focal hemorrhage, intense mononuclear inflammation around small vessels and some adnexa
2. sharp demarcation between superficial necrotic and deeper edematous viable tissue, with occasional islands of regenerating epidermis under necrotic eschar tissue
3. mononuclear perivascular and periadnexal inflammatory infiltrate



EXUDATIVE INFLAMMATION
HEMORRHAGIC INFLAMMATION



ANTHRAX
(PUSTULA MALIGNA)



VARIOLA VERA (NIGRA) –
BLACK SMALLPOX

VARIOLA VERA (NIGRA) – BLACK SMALLPOX

Smallpox an infectious disease caused by one of two virus variants, Variola major and Variola minor.

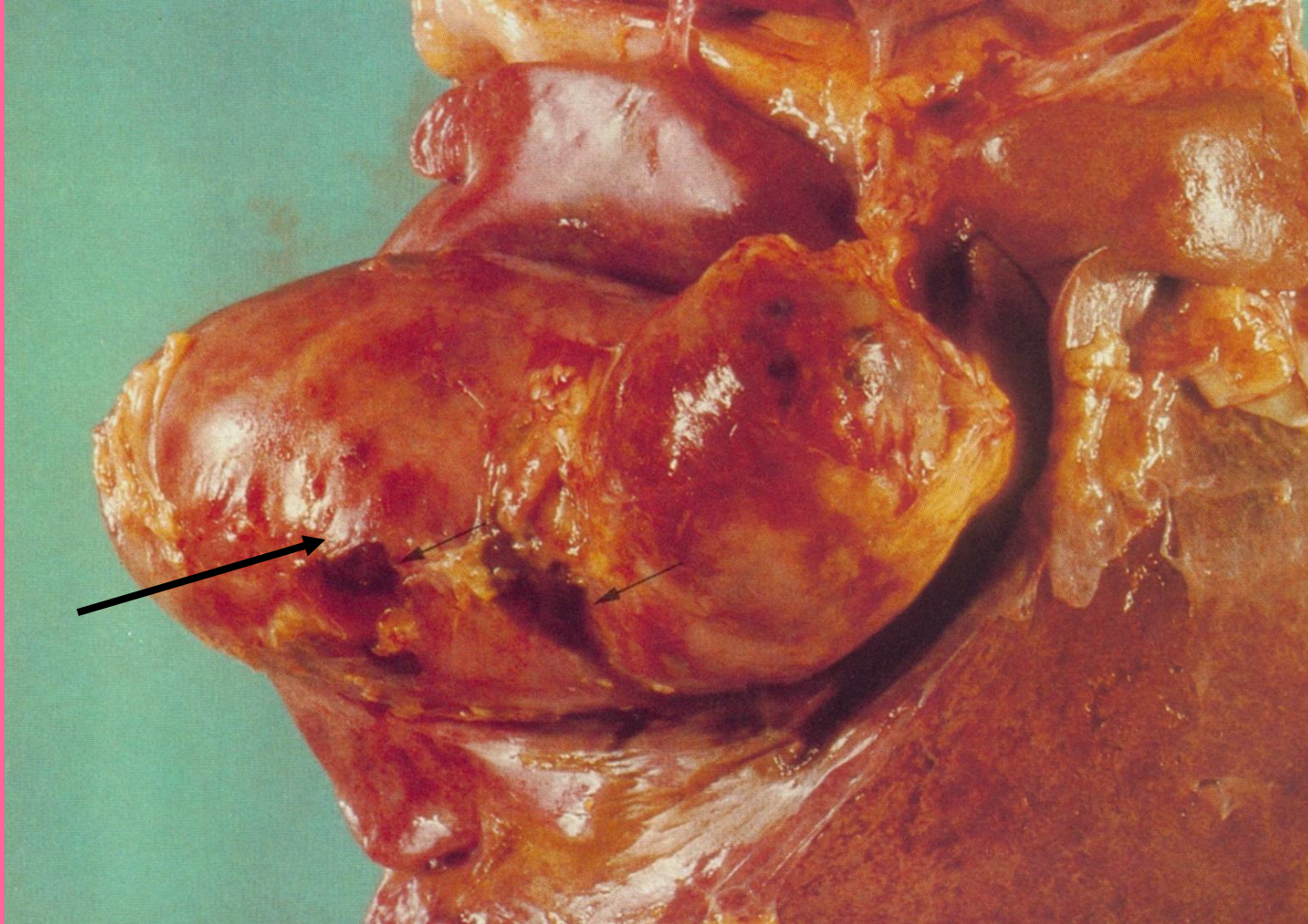
Initial symptoms include fever and vomiting. This is followed by formation of sores in the mouth and a skin rash.

Over a number of days the skin rash turned into characteristic fluid filled bumps with a dent in the center, then scabbed over and fell off leaving scars



EXUDATIVE INFLAMMATION

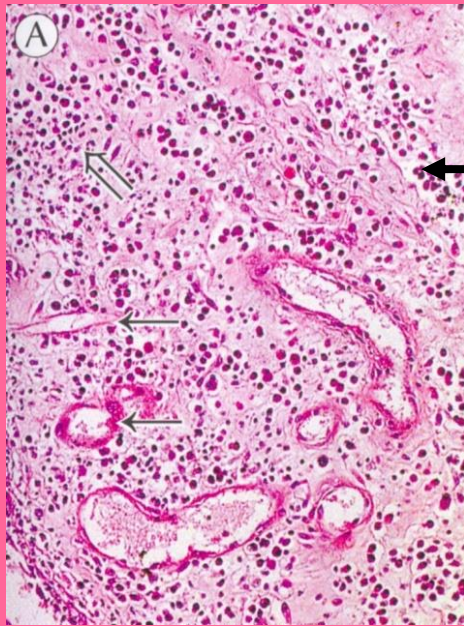
GANGRENOUS INFLAMMATION (ICHOROUS)



CHRONIC CHOLECYSTITIS (EXACERBATING GANGRENOUS)

PROLIFERATIVE INFLAMMATION

GRANULATION TISSUE



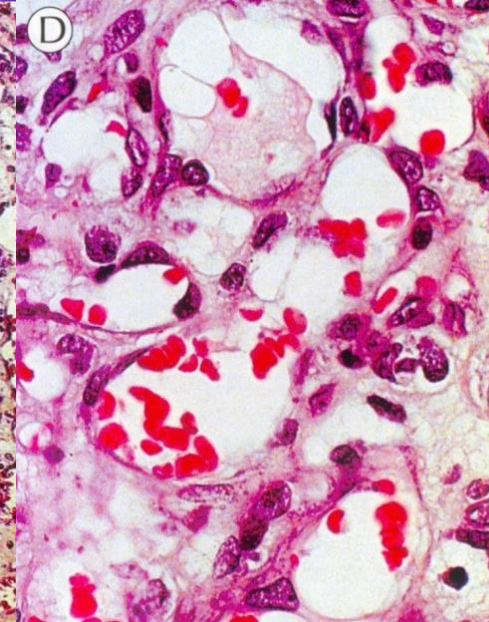
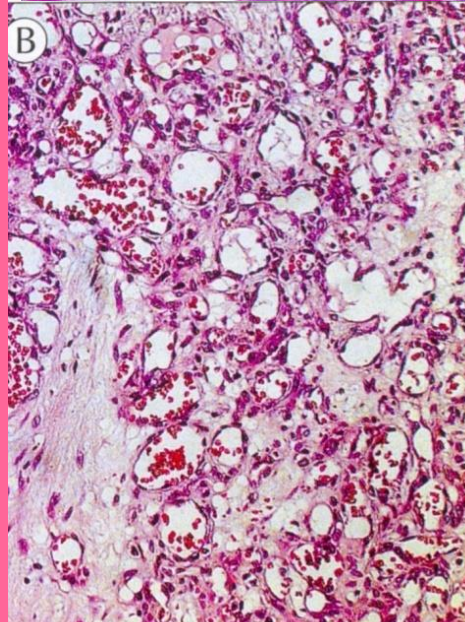
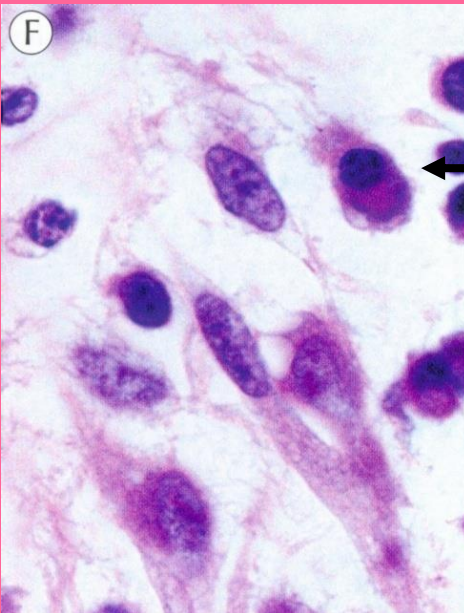
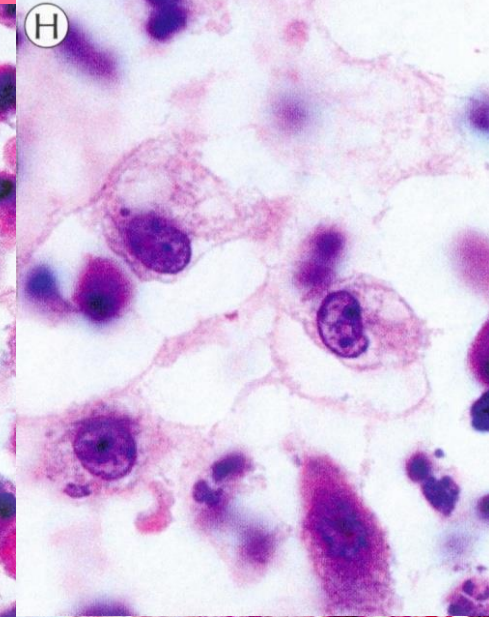
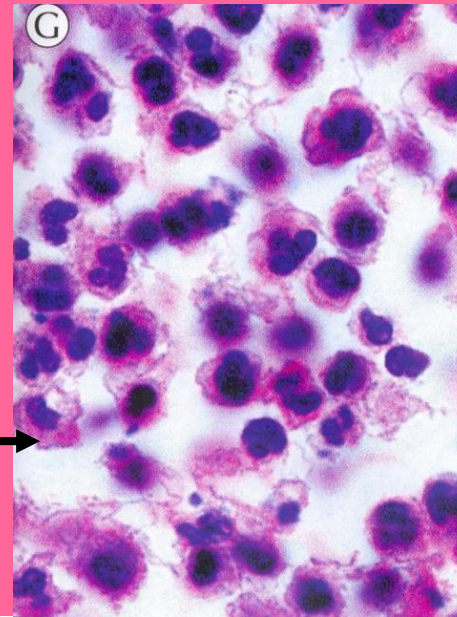
**A.
GRANULATION
TISSUE
„YOUNG”**

**G. ABUNDANCE
OF
NEUTROPHILS**

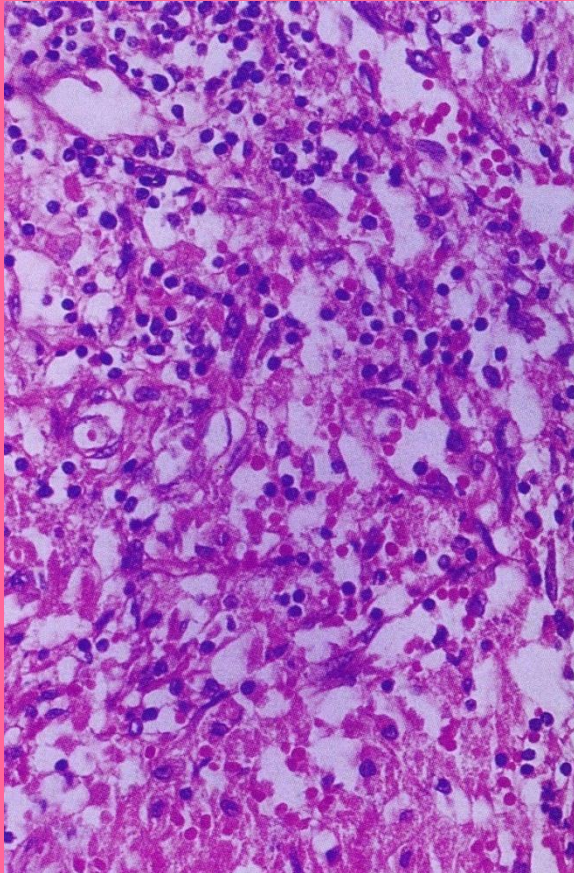
**H.
MACROPHAGES
AND
HISTIOCYTES**

**F.
FIBROBLASTS**

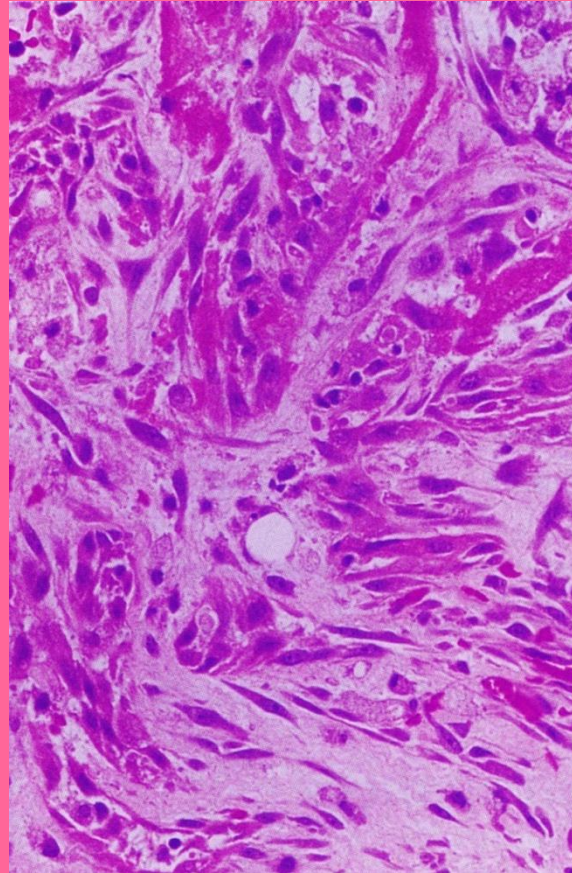
**B.D.
GRANULATION
TISSUE –
PYOGENIC
GRANULOMA
(TELEANGIECTA-
TIC)**



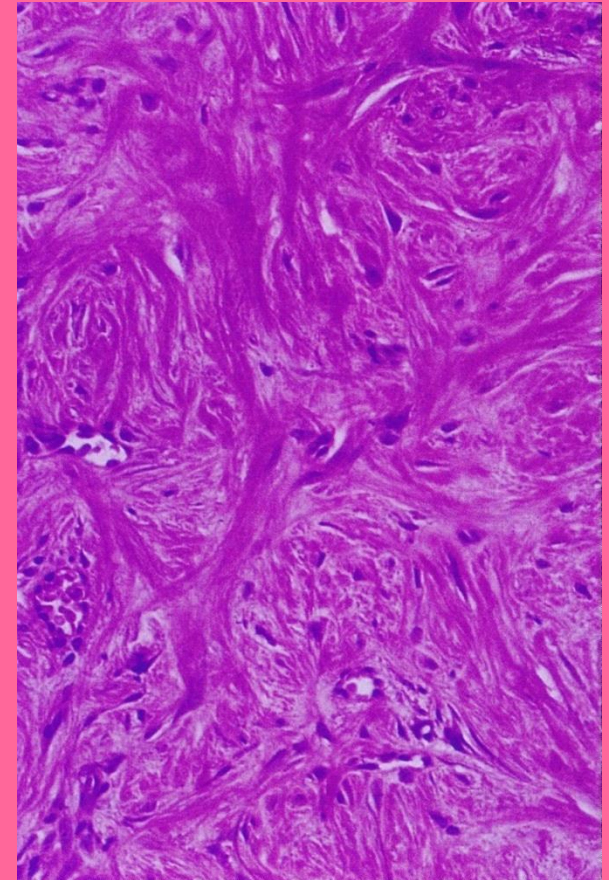
**PROLIFERATIVE INFLAMMATION
WOUND (VULNUS) → TELA GRANULOMATOSA →
SCAR (CICATRIX)**



**GRANULOUS TISSUE
TELA
GRANULOMATOSA
GRANULATION**

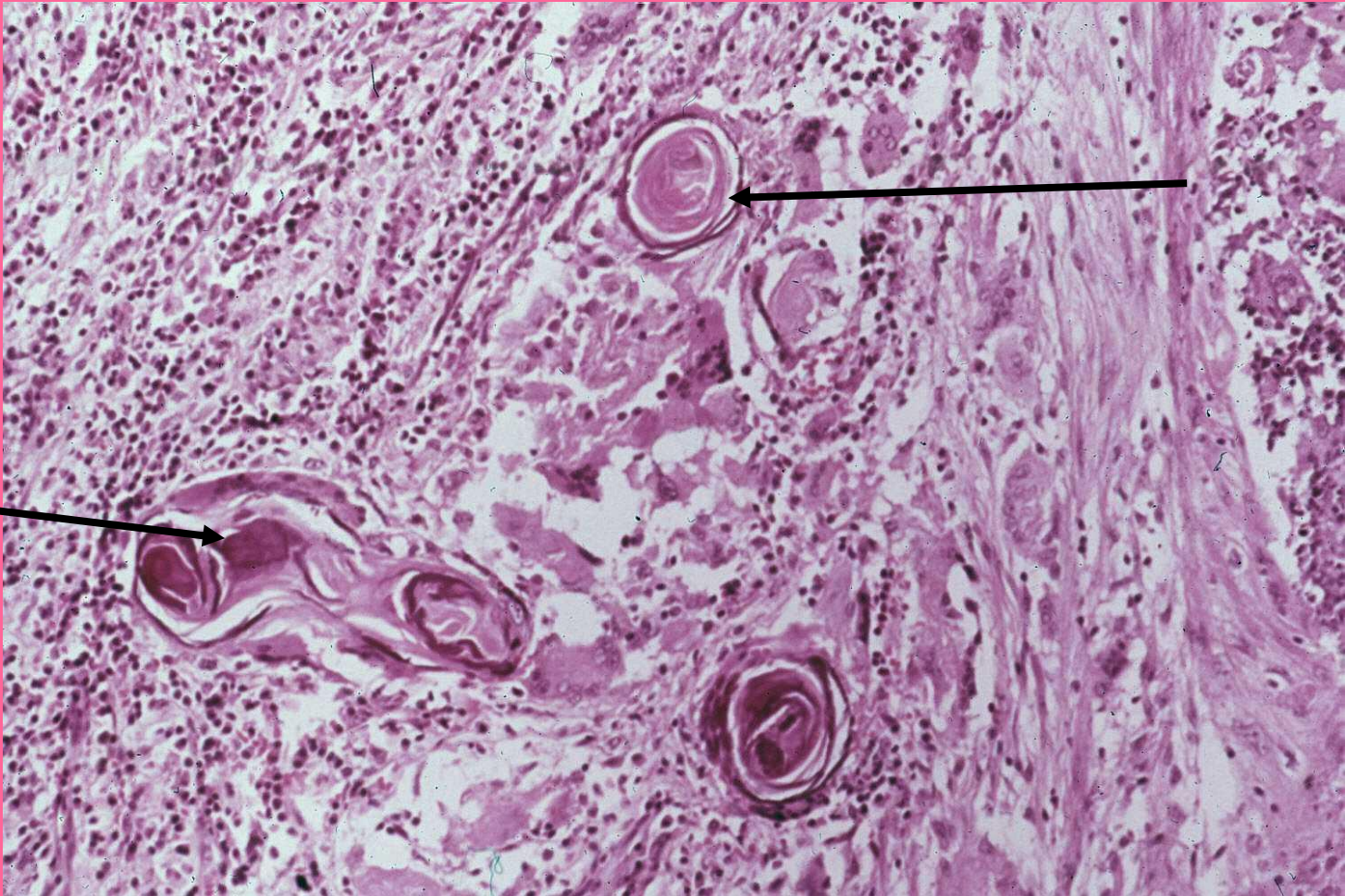


**FRESH SCAR
*CICATRIX RECENS***



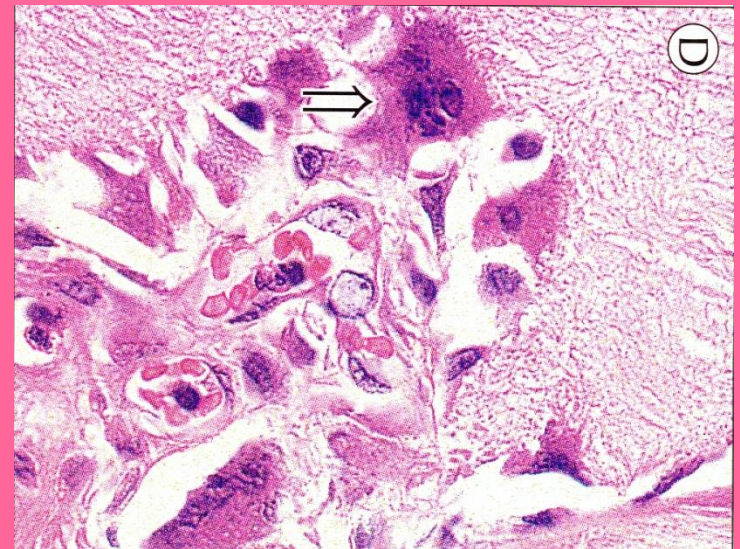
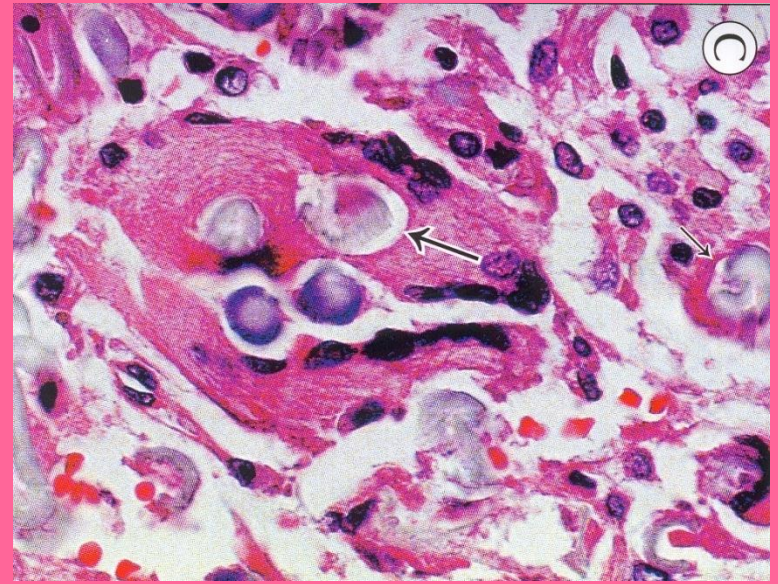
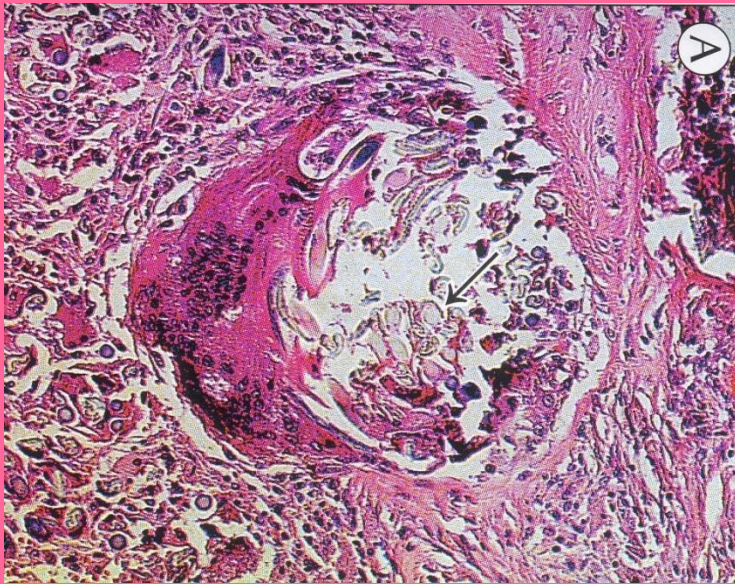
**OLD SCAR
*CICATRIX VETA***

GIANT-CELL GRANULATION AROUND FOREIGN BODIES



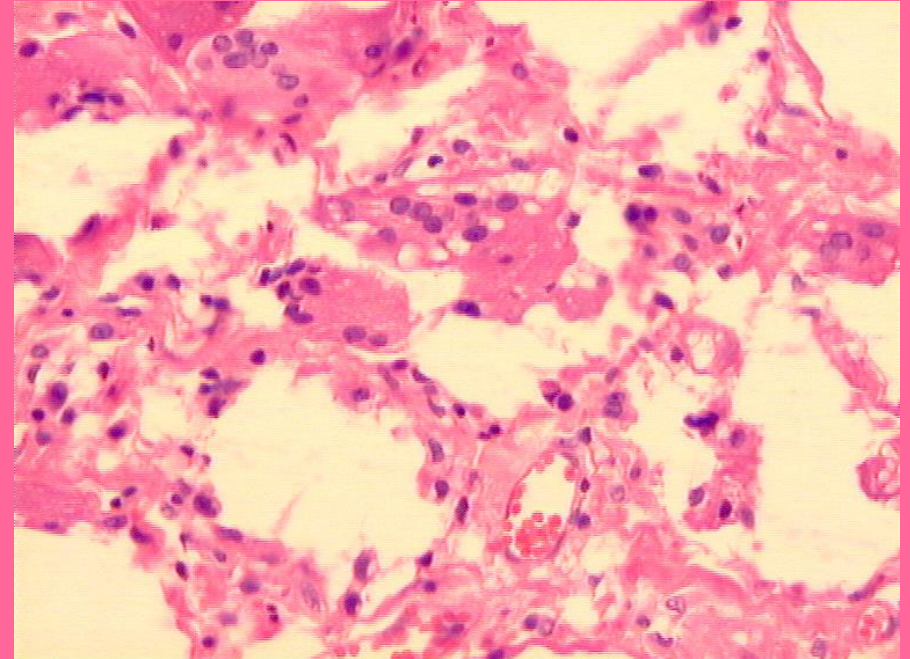
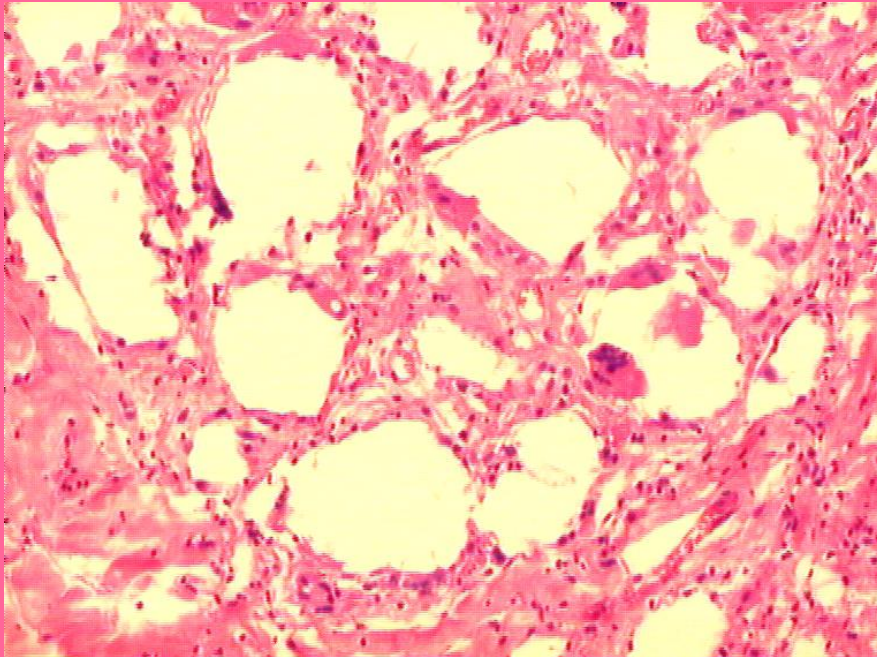
**GIANT-CELL GRANULATION IN THE VICINITY OF AN EPITHELIAL PEARL
IN SQUAMOUS CELL CARCINOMA OF THE ESOPHAGUS**

GIANT-CELL GRANULATION AROUND FOREIGN BODIES...



... AROUND SURGICAL THREADS

GIANT-CELL GRANULATION AROUND FOREIGN BODIES

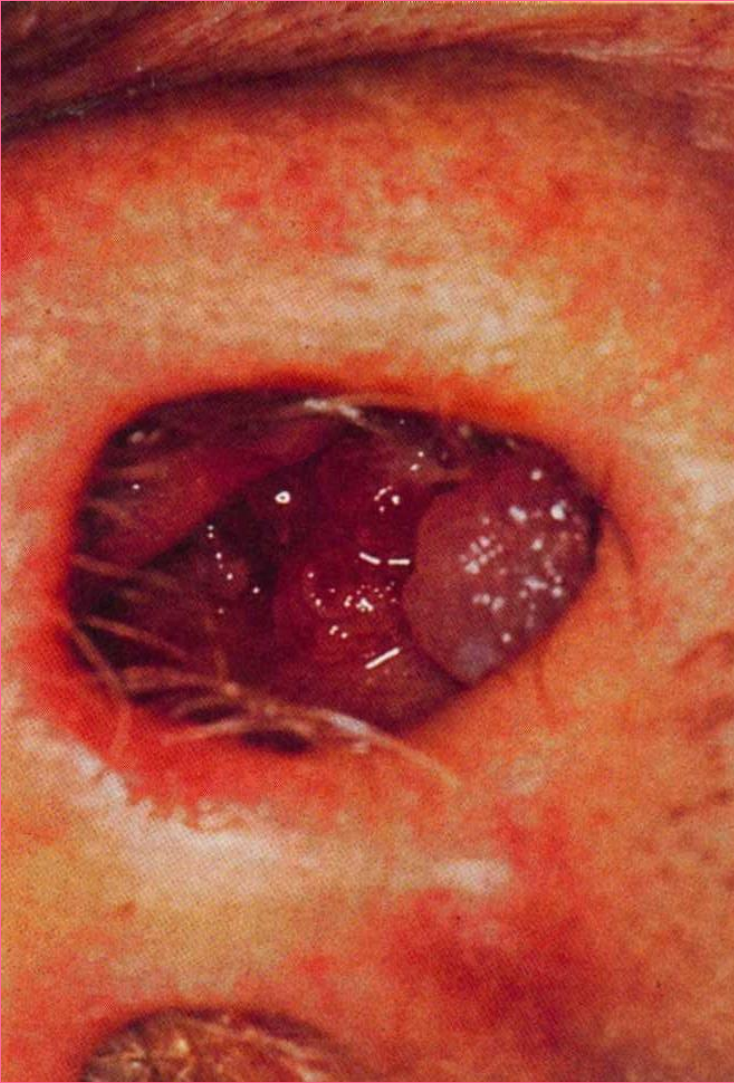


RESORPTIVE GRANULOMA – LIPOPHAGIC GRANULOMA
GRANULOUS TISSUE WITH MULTINUCLEATED GIANT CELLS AROUND THE FAT
AFTER TRAUMA OF THE BREAST
INTRA OPERATIVE CASES (PATIENT MANAGEMENT)

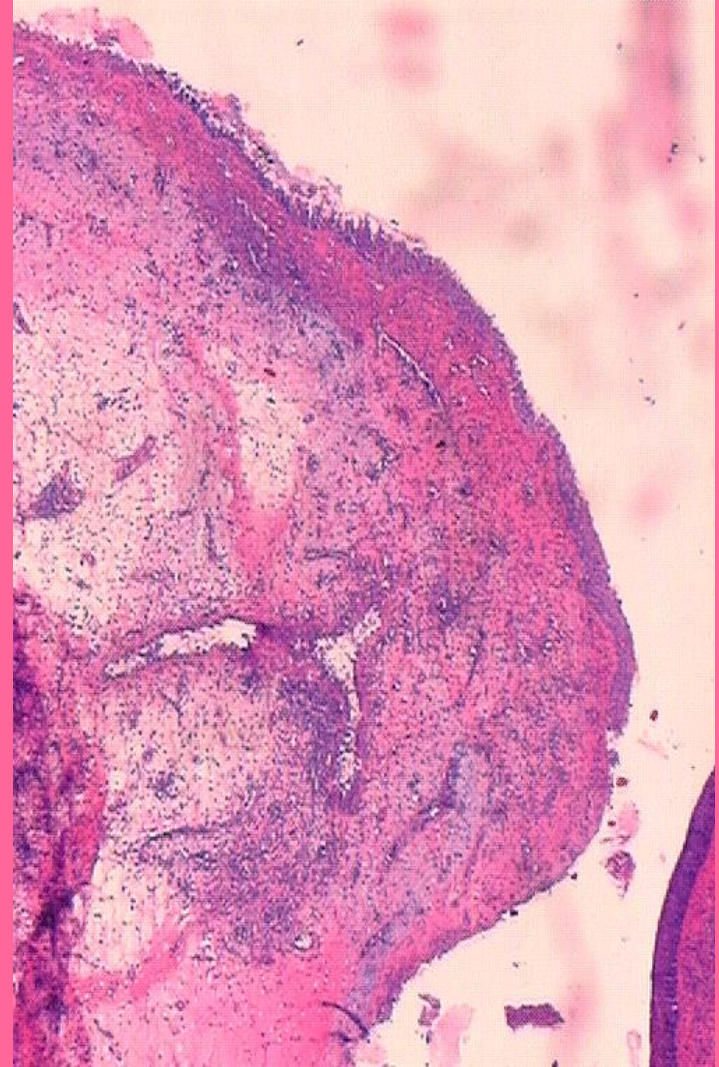
NASAL POLYPS

- Common; not neoplastic but may fill entire nasal cavity or extend into cranial cavity or orbit
- In children, must rule out cystic fibrosis
- Often recur due to persistence of causative factors
- Edematous lamina propria with variable inflammatory infiltrate including eosinophils
- Subtypes include angiectatic (angiomatous), cystic, edematous, fibrous, glandular

CHRONIC POLYPOSE INFLAMMATION

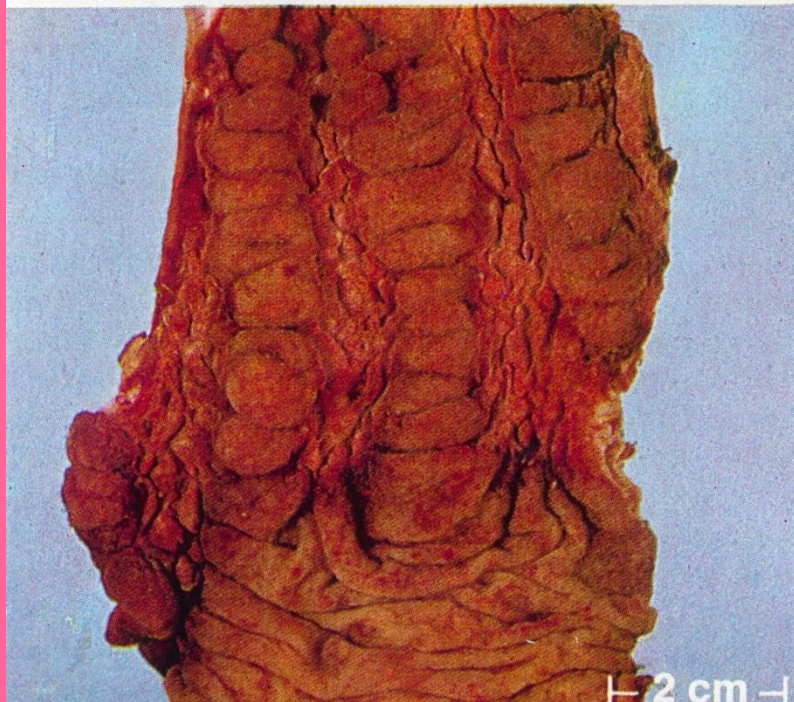
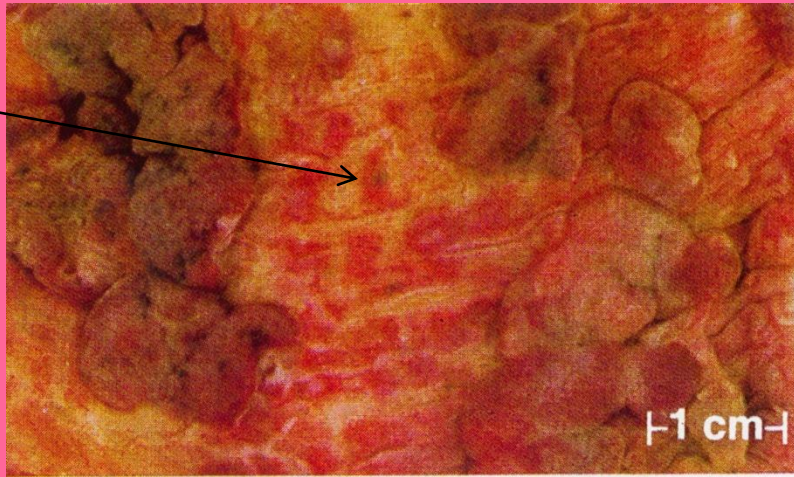


NASAL POLYPOSIS

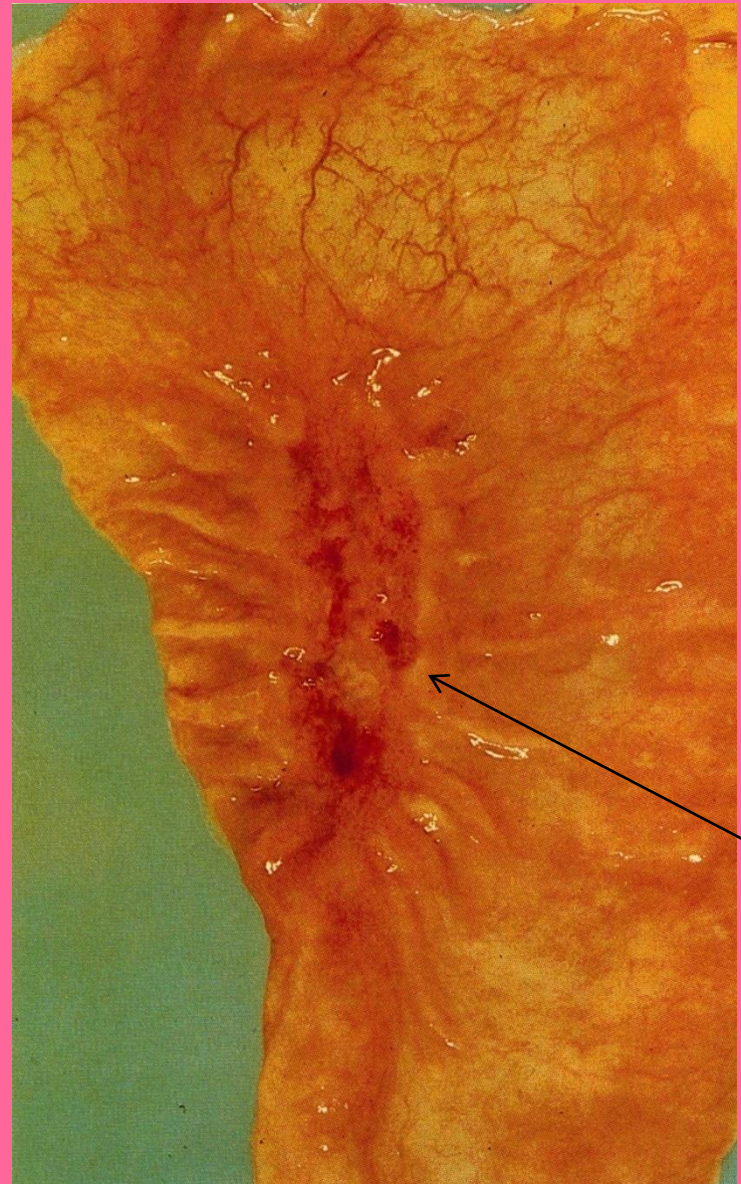


INFLAMMATORY NASAL POLYPS

ULCERATIVE INFLAMMATION

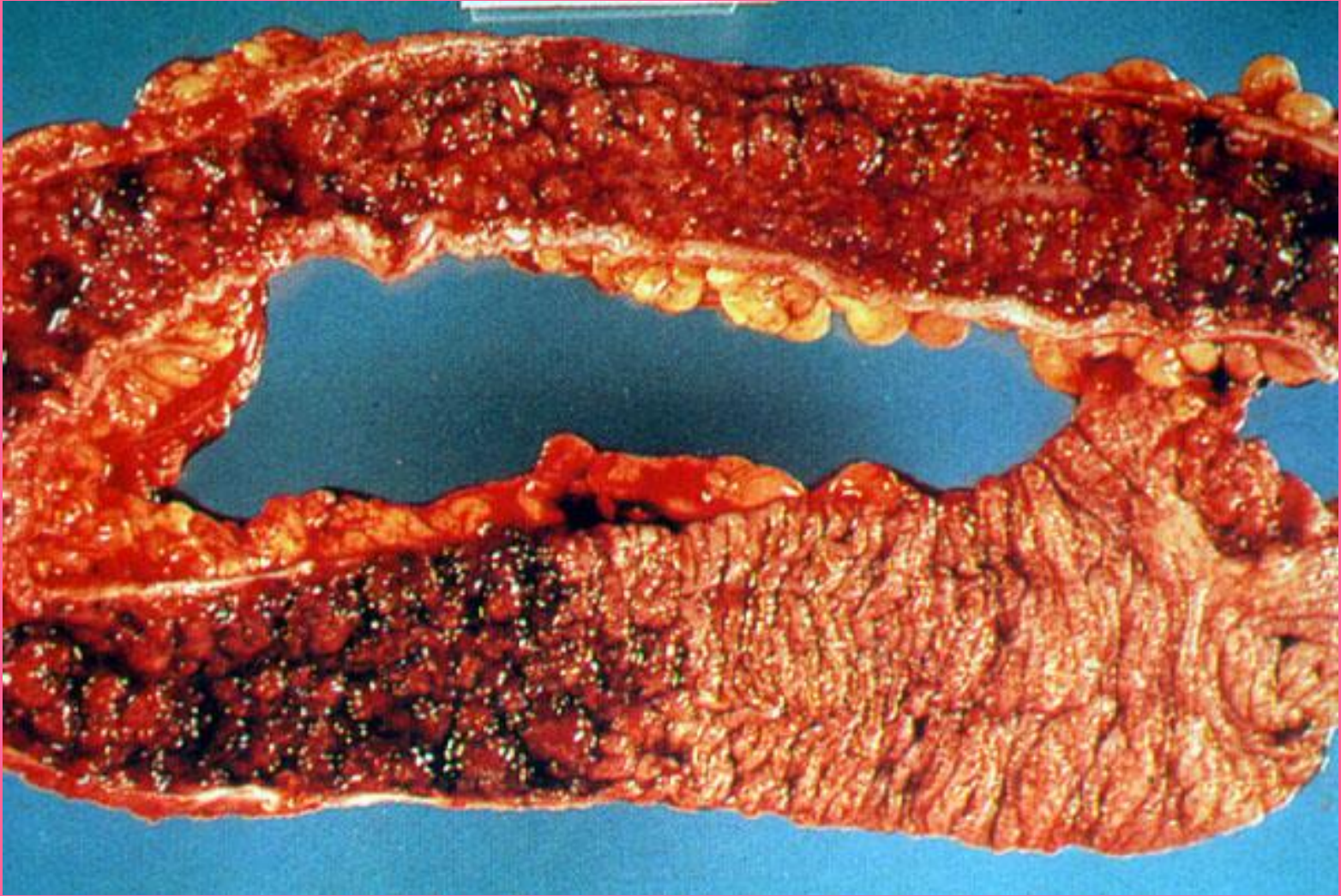


ULCERATIVE COLITIS



**TYPHOID FEVER - *STADIUM*
*ULCERATIONIS***

ULCERATIVE COLITIS



Characteristic lesion consists of a continuous diffuse involvement from the rectum back into the colon

Inflammatory bowel disease (IBD)

Ulcerative colitis

- One of two types of inflammatory bowel disease (Mod Pathol 2003;16:347)
- 60% have mild disease; 97% have one relapse per 10 year period
- Affects 4 - 12 per 100,000 in U.S., usually whites, peak onset ages 20 - 25 and 70 - 80 years; no gender preference

Inflammatory bowel disease (IBD)

Ulcerative colitis

- Almost always rectal involvement at disease onset but may develop rectal sparing and patchiness after treatment or chronic disease, resembling Crohn's colitis
- Symptoms: relapsing, bloody mucoid diarrhea (stringy mucus) with pain/cramps relieved by defecation; lasts days/months, then remission for months/years; initial attack may cause medical emergency for fluid and electrolyte imbalance
- Complications: perforation, toxic megacolon (due to toxic damage to muscularis propria and neural plexus with shutdown of neuromuscular function), iliac vein thrombosis, carcinoma, lymphoma

Inflammatory bowel disease (IBD)

Ulcerative colitis

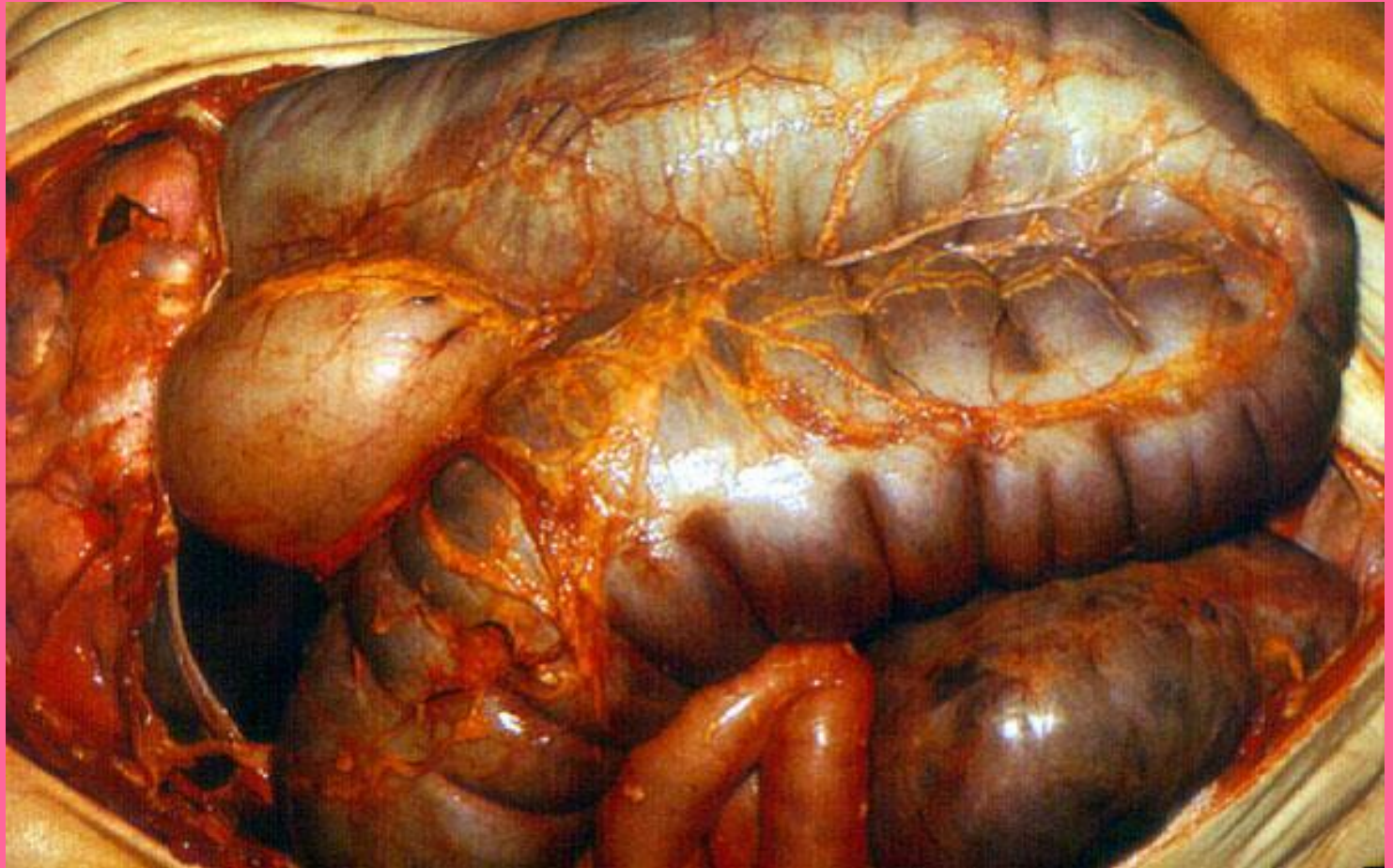
- Ulceroinflammatory disease, usually limited to colon, diffuse continuous disease from rectum proximally (pancolitis in some cases), see exceptions above; ileitis and involvement of appendix also occurs in continuity with severe colitis; anal lesions also (fissures, fistulas, skin excoriation, abscess); disease worse distally than proximally
- Usually no deep fissuring ulceration, no strictures or fistulas, no sinus tract formation, no small intestinal involvement, no serositis, no bowel wall thickening, no fat wrapping

Inflammatory bowel disease (IBD)

Ulcerative colitis

- **Early: mucosa is hemorrhagic, granular, friable; changes usually diffuse (similar intensity throughout)**
- **Late: extensive ulceration along bowel axis but usually not serpentine as in Crohn's disease; have pseudopolyps (isolated islands of regenerating mucosa) and flat mucosa; usually normal wall thickness and normal serosa; severe cases may have megacolon or fibrotic, narrow or shortened colon**

TOXIC MEGACOLON



Severe ulcerative colitis as well as other disease states can lead to toxic megacolon

Inflammatory bowel disease (IBD)

Ulcerative colitis



Continuous inflammation of the colon on the right



THANK YOU