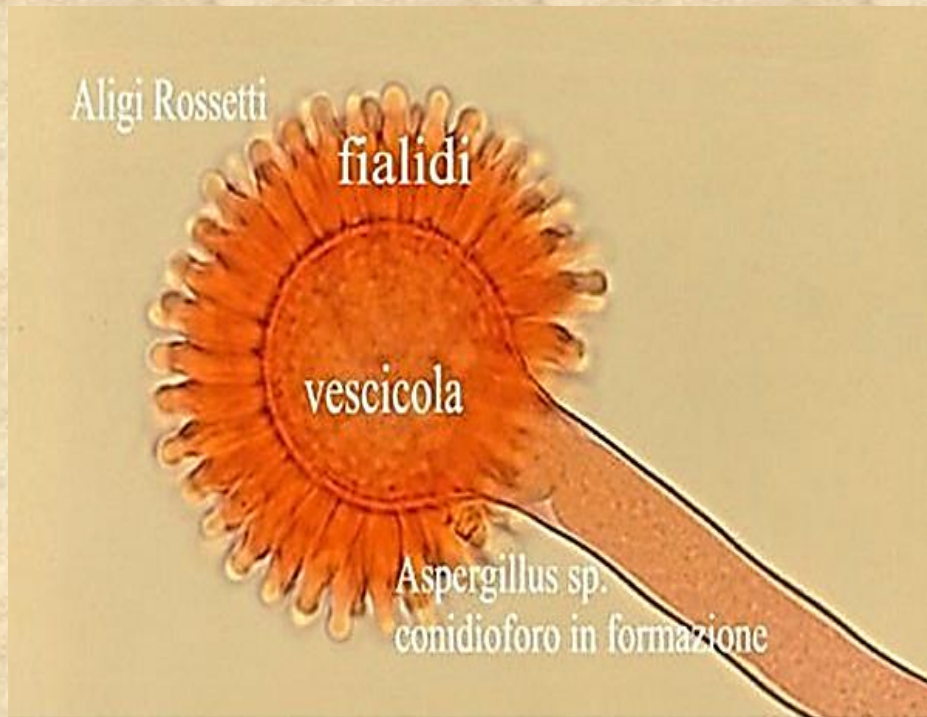


Aspergillosis



Definition:

Aspergillosis:

- Tissue invasive disease
- Allergic disease

Aspergilloma (fungus ball)

➤ Mycotoxicosis:

Asp.flavus and Asp.parasiticus

➤ Otomycosis

➤ Onychomycosis

➤ Keratitis, or postoperative infections

➤ Mycetoma

❖ Animals

Agents:

Aspergillus

➤ Farms

➤ Ubiquitous

➤ Cellars

➤ Exogenous

➤ Hay barns

Agents:

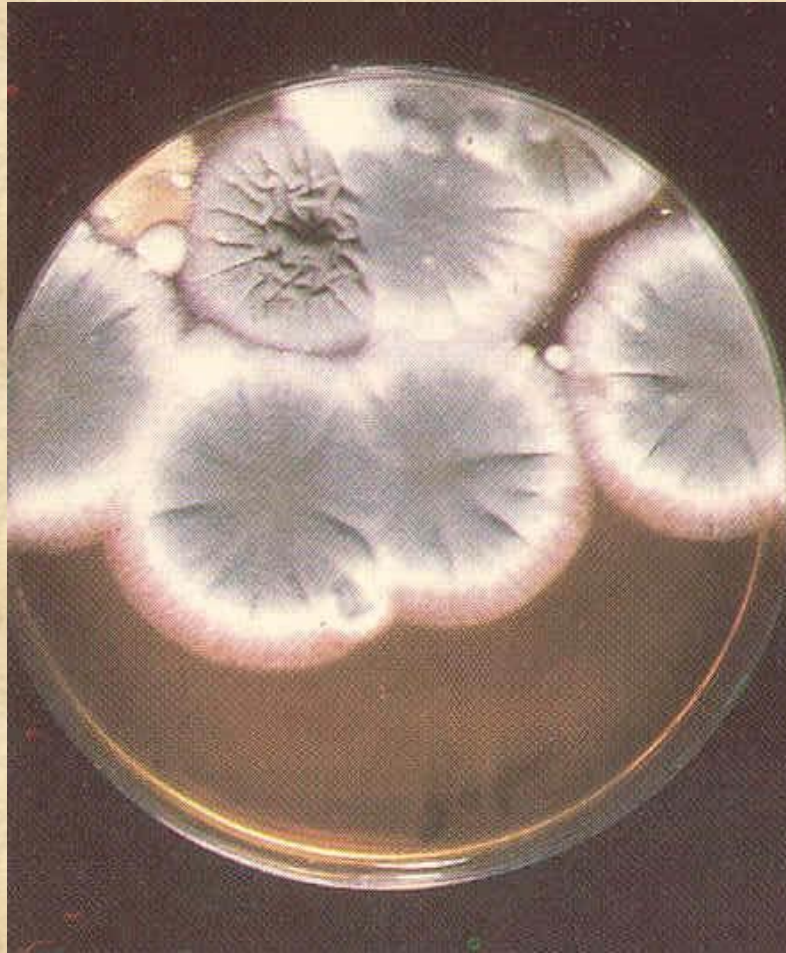
➤ *Aspergillus fumigatus*

(invasive) 90%

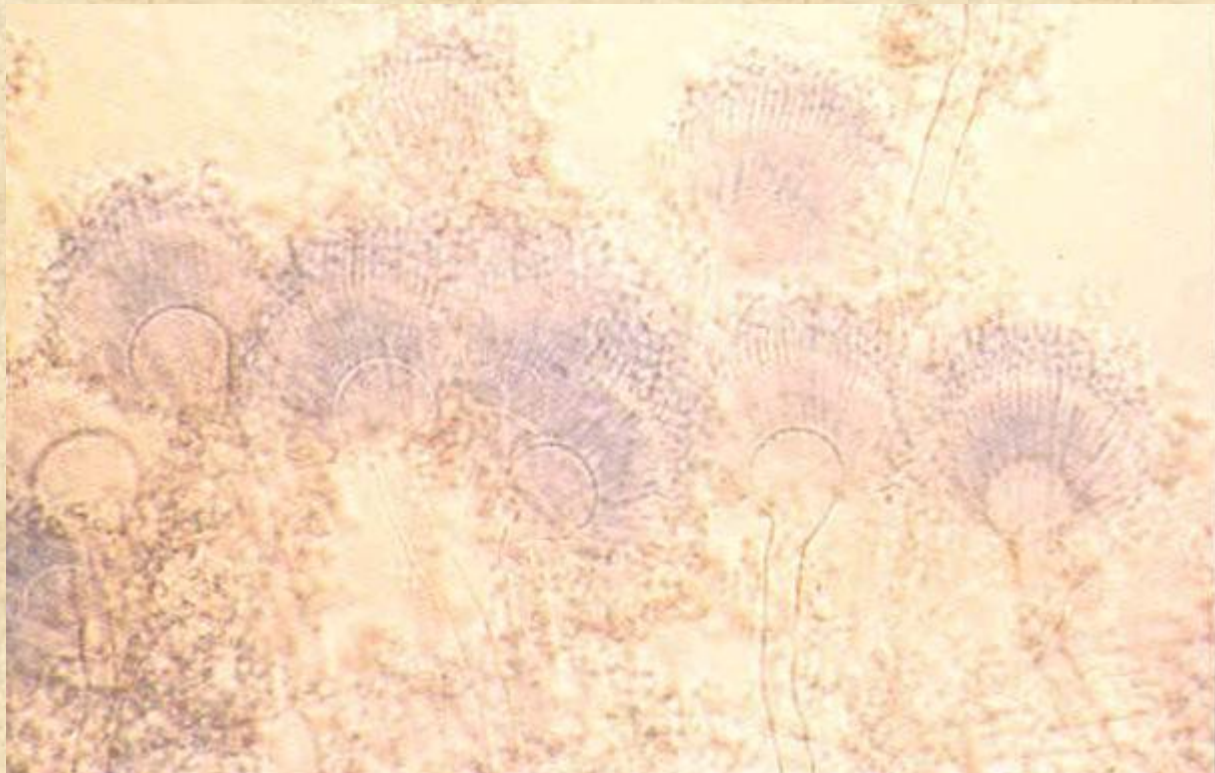
➤ *Fumigatus* & *Clavatus*(allergic)

➤ *Asp.flavus* 10%

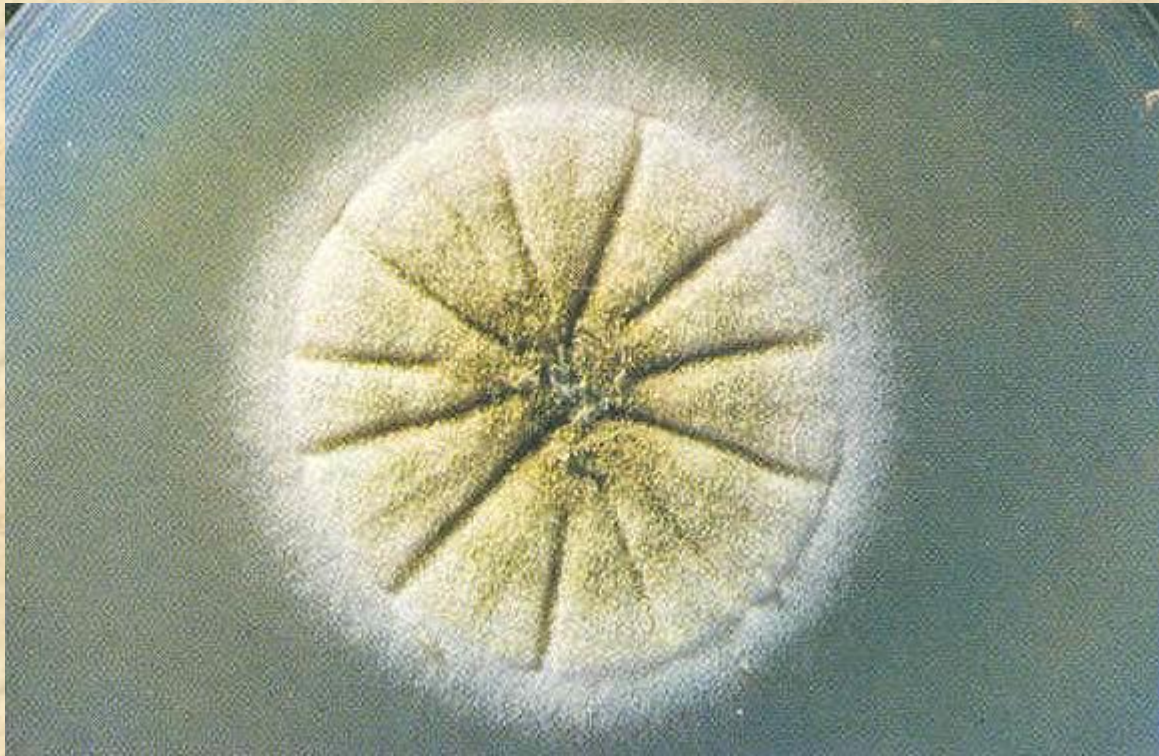
Asp.fumigatus



Asp.fumigatus



Asp.flavus



Asp niger



Aspergillus terreus



Predisposing factors:

For invasive aspergillosis

CGD.

Transplant

Corticostreoid

Pathogenesis:

Asp.fumigatus

Fast.diameter(3-5)

Termotolorant

hydrophobic

Pathogenesis:

- Aflatoxines
- Fumagillin
- Ochratoxine A
- Gliotoxin

Clinical manifestations of Aspergillus:

Clinical manifestations:

1-Allergic disease (lung and sinus):

- Allergic bronchopulmonary aspergillosis
- Allergic aspergillus sinusitis

2-Aspergilloma (lung and sinus)

Clinical manifestations:

3-Invasive disease:

- Invasive pulmonary aspergillosis (IPA)
- invasive aspergillus sinusitis

Clinical manifestations:

➤ 4-Brain

➤ 5-Endophthalmitis

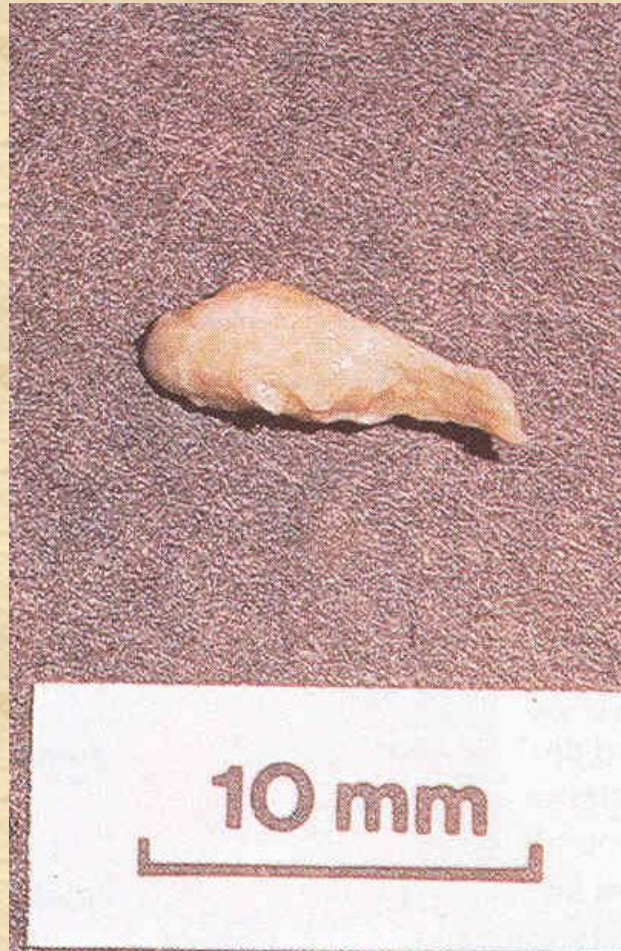
➤ 6-Cutaneous aspergillosis

Allergic disease:

1-Allergic bronchopulmonary aspergillosis:

- ❖ Underlying asthma
- ❖ Cystic fibrosis
- ❖ (IgG.IgE)
- ❖ Plug. Charcot-leyden crystals
- ❖ Cortico...

Typical sputum plug of allergic bronchopulmonary aspergillosis



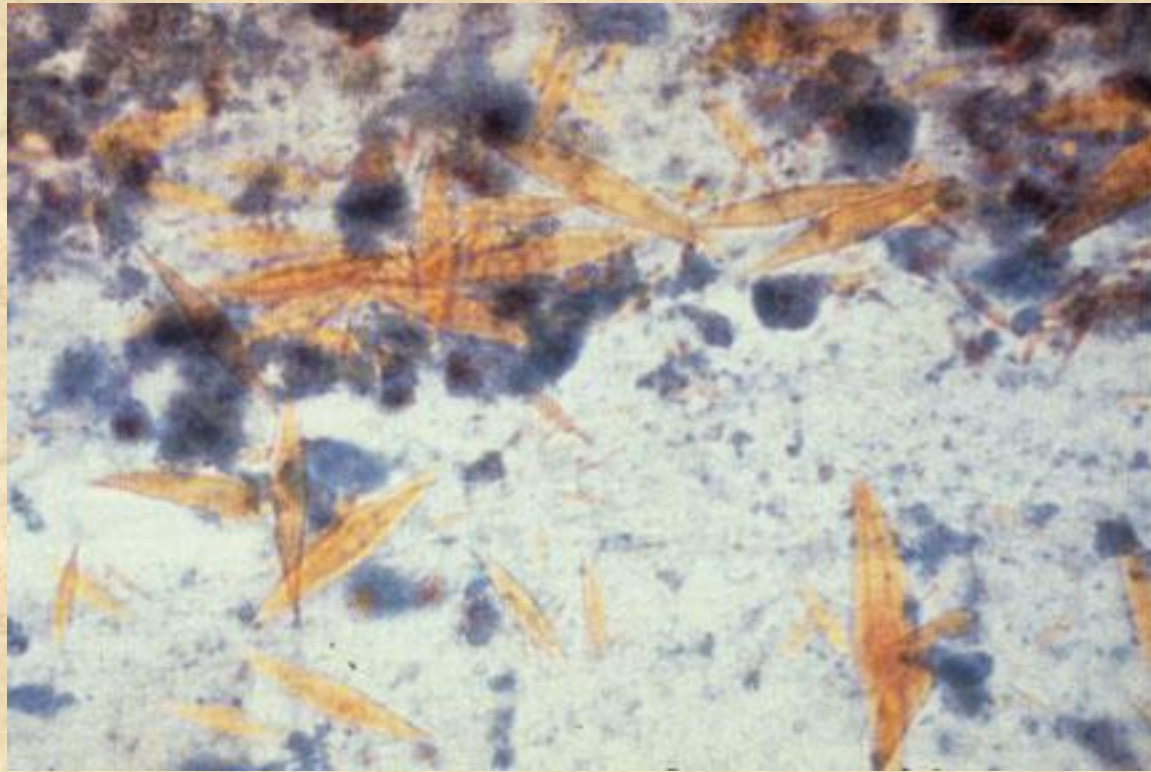
2-Allergic aspergillus sinusitis:

Black fungi.

nasal

surgery

Charcot-leyden crystals



Aspergilloma (lung):

➤ Preexisting pulmonary cavities

➤ Cysts or Tuberculosis

❖ Pseudoallescheria

❖ Mucorales

Aspergilloma (lung):

➤ Some:

Asymptomatic

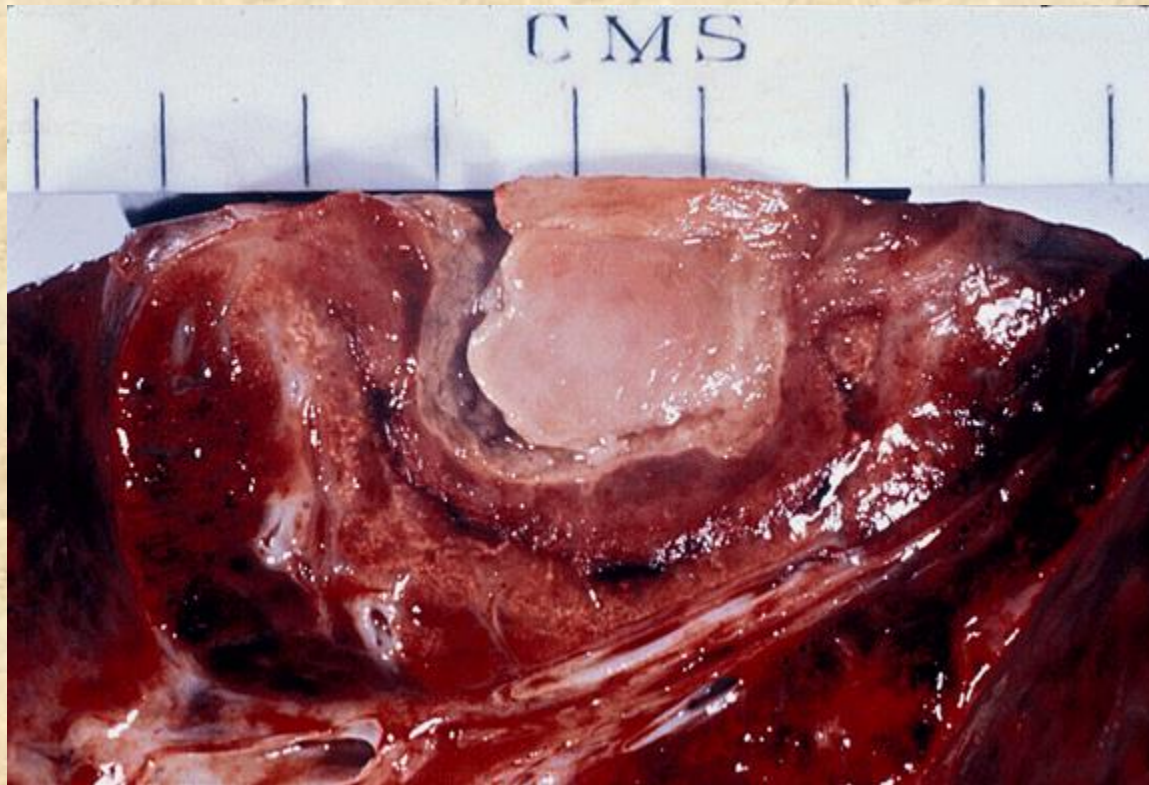
Cough.

IgG in serum

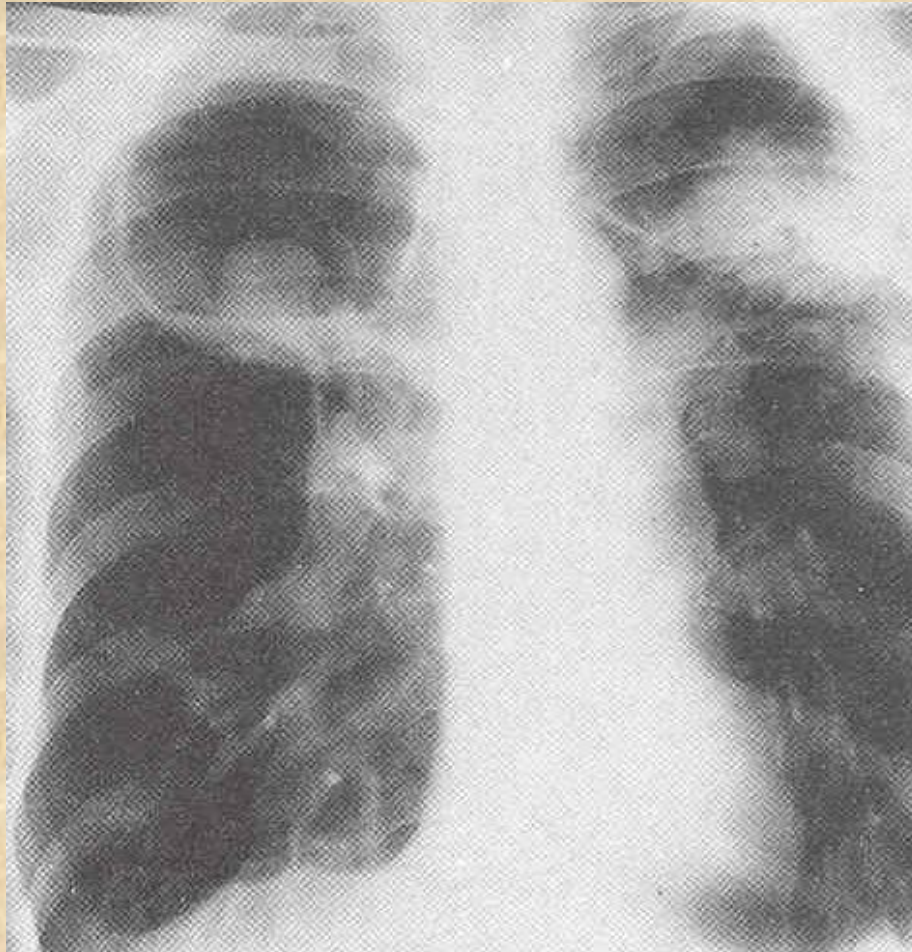
Difficult to treat

Surgery

Aspergilloma (Fungus ball)



Bilateral aspergillomas



Aspergilloma (sinus):

- Maxillary and ethmoid sinus cavities
- Endodontic treatment of the upper jaw

Invasive pulmonary aspergillosis (IPA) (80-90%)

Most immunocompromised patients:

- Bone marrow transplant recipients
(acute IPA)

Less immunocompromised patients:

- AIDS (chronic IPA)

Acute IPA:

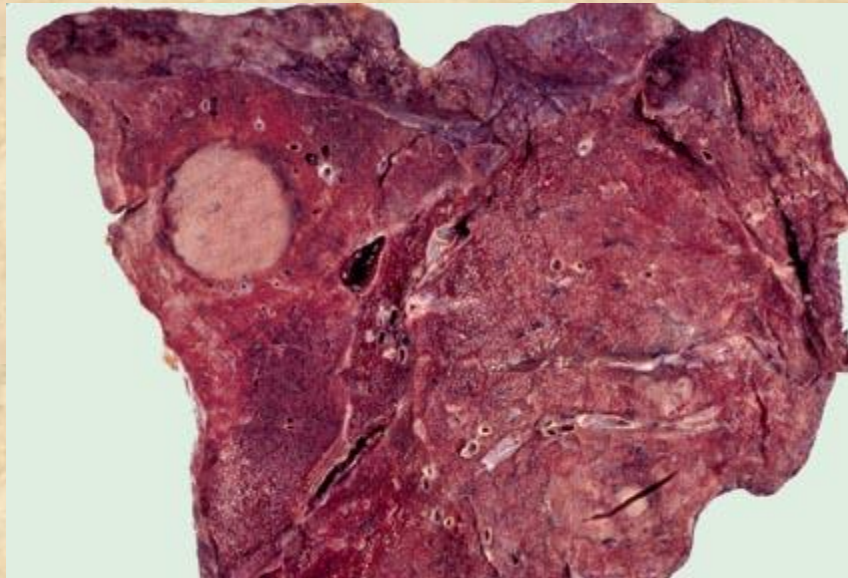
- The earliest symptoms

- ❖ the nodules may cavitate

- ❖ The major problem:

- Hemoptysis

Invasive Pulmonary Aspergillosis — A Nodular Infarct Surrounded by a Hemorrhagic Rim



Chronic IPA:

- ❖ Lower incidence of chronic IPA

- ❖ A substantial minority:

 - No immunocompromising factors

Chronic IPA:

❖ Symptomatic:

for weeks or months

Chronic IPA:

- ❖ Cavitation (Chest radiography)
- ❖ Difficulty...lung aspergiloma
- ❖ Definitive diagnosis:
 - ❖ biopsy
 - ❖ Strongly positive Aspergillus antibodies in serum
 - ❖ Culture +

Invasive *Aspergillus* sinusitis:

- Acute
- Chronic
- Granulomatous
- (Asp.flavus.paranasal)

Acute rhinosinusitis:

- Neutropenic patients
- Bone marrow transplant recipients

Acute rhinosinusitis:

- Fever
- Cough
- Epistaxis
- Headache
- Nasal discharge
- Sinus pain

Destructive lesion of the maxillary sinuses,
anterior palate, and nasal passages



Chronic invasive aspergillus sinusitis:

➤ Most patients:

No immunocompromising factors

➤ A substantial minority:

Diabetic.

Brain:

The worst manifestation

- Bone marrow transplant (25-50%)
- Complication of neurosurgery

Brain:

- ❖ The most immunocompromised patients(attack)
- ❖ Less immunocompromised patients (Headache)
- ❖ Aspergillus meningitis is rare.

Disseminated **Aspergillosis** of a Brain



Brain:

❖ CT scan:

- Abscess

❖ Definitive diagnosis:

- Biopsy
- Aspiration of a cerebral lesion

Endophthalmitis:

- ❖ Uncommon
- ❖ After penetrating eye surgery or trauma
- ❖ Hematogenous endophthalmitis (endocardit ...)

Cutaneous:

- In neutropenic patients
- In premature neonates
- In AIDS patients

Primary cutaneous aspergillosis

- Site of an intravenous catheter
- Leukemia

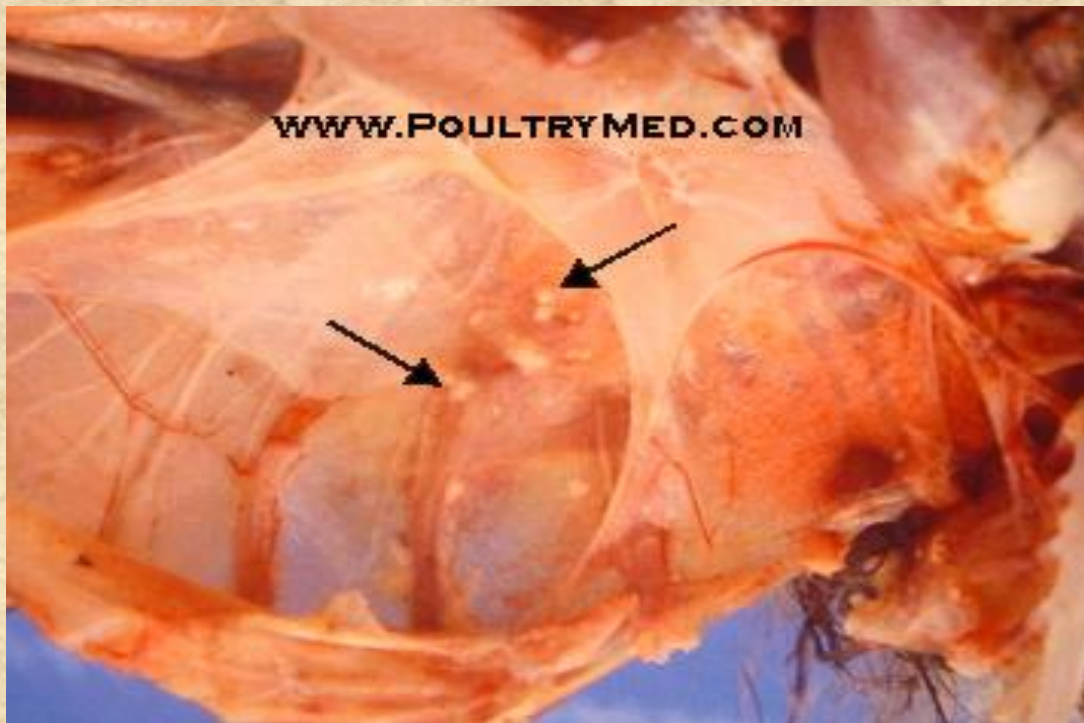


Cutaneous aspergillosis



Aspergillosis

- Caseous nodules in the air sac



Laboratory Diagnosis:

1-Collection of samples

2-Direct examination

3-Culture

4-Serology

5-Molecular techniques

Bronchopulmonary aspergillosis: Bronchial casts or plugs



Direct examination:

➤ KOH

➤ GMS

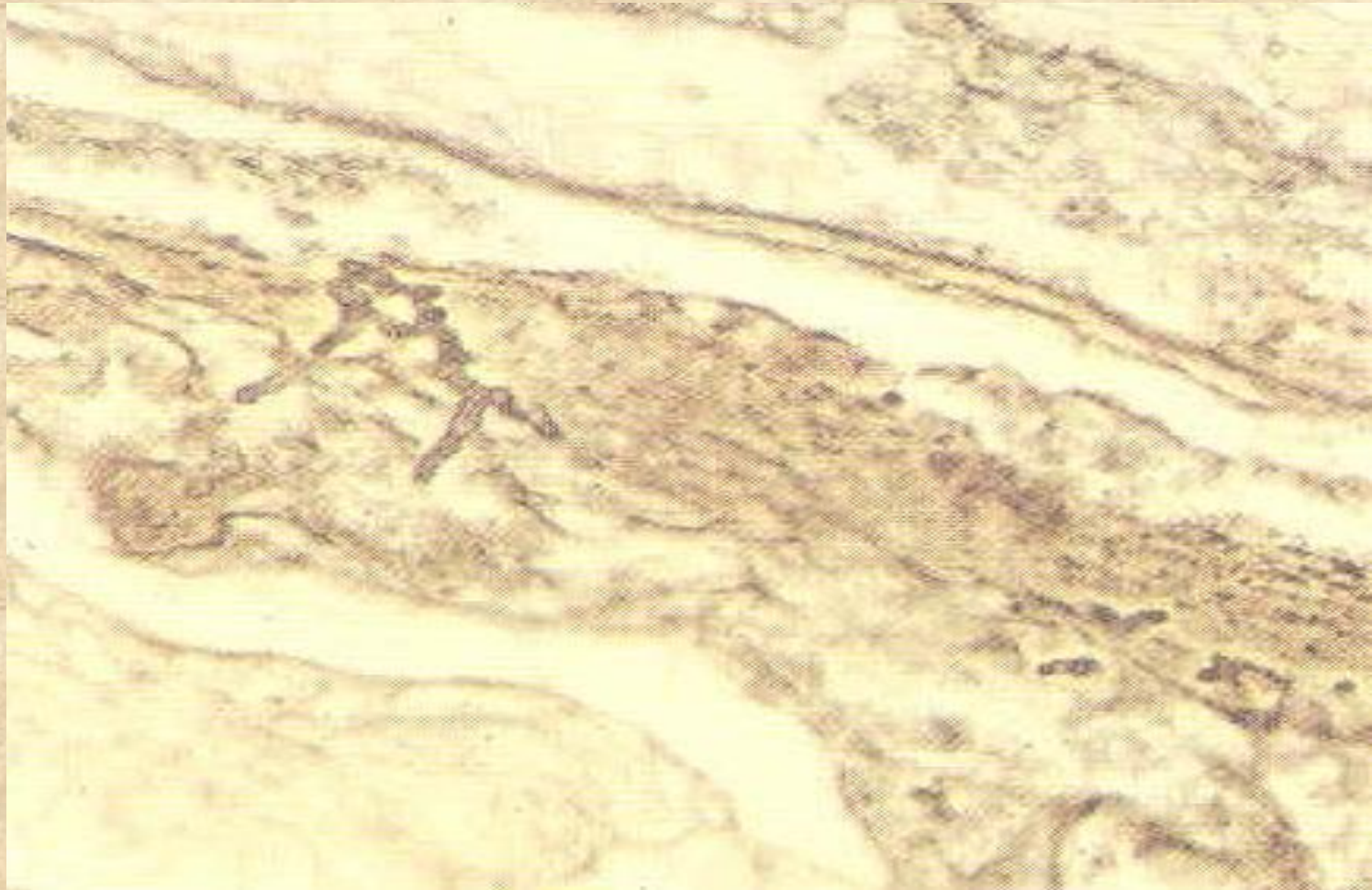
➤ H & E

➤ PAS

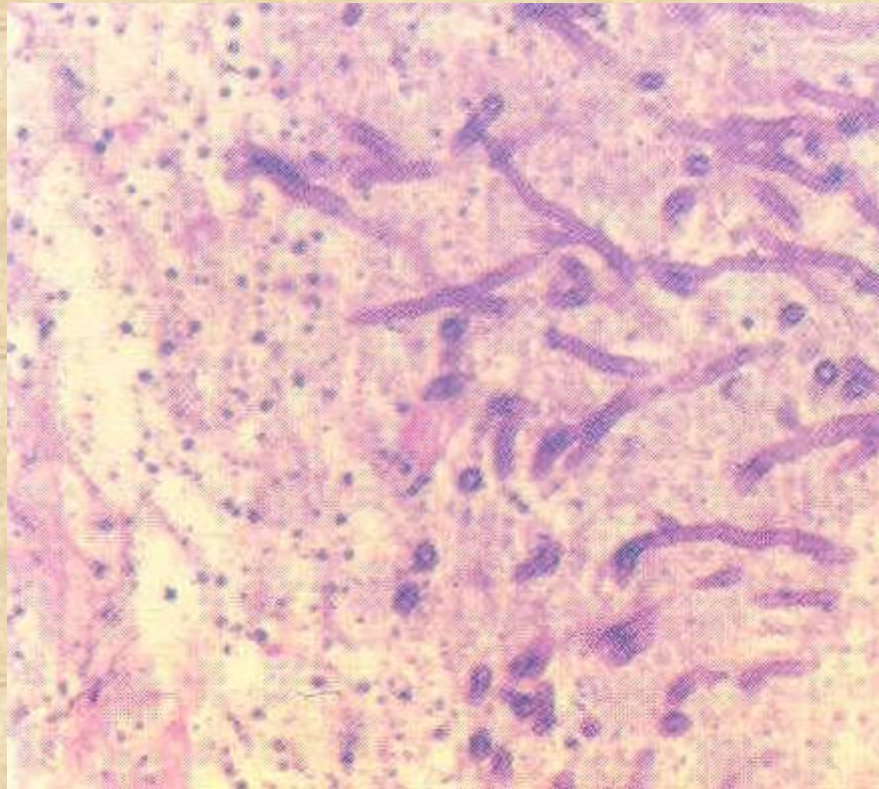
❖ Dichotomus hyphae

❖ 2.5-8 μm

Section of plug: GMS



Section of invasive aspergillosis: H &E



Biopsy of maxillary sinus: PAS



Culture:

❖ Media:

- SDA + C (SC)
- Malt extract agar
- Czapek's agar

❖ Temperature:

- 25° - 37° C

Aspergillus antibody tests:

- ❖ Poor sensitivity in very immunocompromised patients with invasive aspergillosis
- ❖ ID, CF, CIE

Aspergillus detection system:

➤ Immunodiffusion & Complement Fixation for Antibody Detection



Antigen detection test:

- Circulating galactomannan antigen

- ❖ (2-3)

- ❖ Sandwich ELISA

- (1-3 D-glucan)

- Latex agglutination

In allergic form:

➤ RAST test (specific IgE)

DNA detection:

❖ Molecular techniques

Treatment:

❖ Allergic:

- Prednisone
- Itraconazole

Prevention: High-dose inhaled steroids

❖ Aspergilloma:

- Surgery
- Amphotericin B

Treatment:

❖ Invasive:

➤ Surgery

- Amphotericin B
- Itraconazole
- Voriconazole
- Caspofungin
- Inf

