Spot Diagnosis in Infectious Diseases

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A 45-year-old female

- with poorly controlled type 2 DM presented with a 1-week fever and right upper quadrant abdominal pain. She lives in Ubonratchathani and had a history of chronic intermittent abdominal discomfort for a year. CT abdomen showed multiple ring enhancing lesions at the liver and gall stones. Needle aspiration of liver abscess was performed and Gram's stain showed gram-negative rod with bipolar staining, gram-positive cocci and gram-positive bacilli. Melioidosis titer was positive with titer 1:64. What is the diagnosis?
  A. Pyogenic liver abscess
  B. Melioidosis
  C. Primary bacteremic liver abscess
  D. Liver metastasis
  E. Fasciola hepatica infestation

A 35 years old man

- A. Disseminated VZV infection
- B. Disseminated tuberculosis
- C. AIDS
- D. All of the above
- E. None of the above

A 35 years old man

- Group of vesicles on a dermatome distribution
- Bilateral cervical lymphadenopathy

Disseminated VZV infection With
Disseminated tuberculosis
And
Acquired Immune Deficiency Syndrome
**Antiviral treatment**

- Evident in patients > 50 years old
- Use within 72 hours
- Accelerate pain resolution
- Decrease time to healing
- Reduce post-herpetic neuralgia

**Normal host**
- Acyclovir: 800 mg x 5 (7-10 D)
- Valacyclovir: 1 g x 3 (7 D)
- Famciclovir: 500 mg x 3 (7 D)

**Immunocompromised**
- In severe cases:
  - More than 1 dermatome
  - Ophthalmicus
  - Disseminated
- Acyclovir: 10 mg/kg IV q 8 hr (7-14 D)

**Prednisolone reduces discomfort during acute phase but not PHN.**

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**A 30-year old man, HIV, +PPE Presented with headache and left hemiparesis**

**What is the diagnosis**

- A. Tuberculoma
- B. Cryptococcoma
- C. Toxoplasmosis
- D. CNS lymphoma
- E. PML

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**Quiz**

1. Toxoplasmosis
2. PCNSL
3. Tuberculoma

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**HIV and CNS lesions “WITH mass effect”**

- **Toxoplasmosis**
  - Multiple ring enhancing lesion with surrounding edema
  - Site: Cortico-medullary junction
  - Basal ganglia
  - Toxoplasma IgG +

- **Primary CNS lymphoma**
  - Solitary or multiple, enhancing lesion
  - Site: Periventricular, corpus calkosis

- **Norcardiosis**
  - Less common
  - Evidence of disseminated infection

- **Tuberculoma**
  - Solitary or multiple, enhancing lesion
  - Site: Cortico-medullary junction

- **Cryptococcoma**
  - Solitary or multiple, enhancing lesion
  - Site: Periventricular, corpus calkosis

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**Which one is PML?**

1. PML
2. HIV encephalopathy
3. CMV encephalitis with toxoplasmosis

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**HIV and CNS lesions “WITHOUT mass effect”**

- **PML**
  - Demyelinating disease: JC virus
  - Bilateral, asymmetric, hyperintense in T2W MRI
  - Site: Periventricular areas, subcortical white matter

- **HIV encephalopathy**
  - Symmetrical, less well-demarcated
  - Symmetrical T2W Hypointensity
  - Triad: subcortical dementia, depressive symptoms, movement disorders

- **CMV encephalitis**
  - Diffuse micronodular encephalitis or ventriculocerebrospinal (periventricular)
A 42 years old farmer
Fever with headache for 10 days
Myalgia
The diagnosis is……
Scrub typhus

Eschar – found in one third of scrub typhus cases

Which patient has scrub typhus?
A. 
B. 
C. 
D. 
E. All of the above

Eschars

A 45 years old woman
Fever, malaise
Nausea, body ache
Abnormal LFT
Rash after OTC drug
A. Scrub typhus
B. 2nd syphilis
C. Infectious mononucleosis
D. Dengue fever
E. Drug eruption

Anti-EBV (VCA) IgG: Negative
Anti-EBV (VCA) IgM: Positive

A 17 year old man
- β Thal/HbE disease
- Chronic leg ulcer for 2 months after flood

What is the diagnosis?
A. Necrotizing fasciitis
B. Zymomyces
C. Pythiosis
D. Cutaneous nocardiosis
E. Mycobacterial infection

Pythium insidiosum antibody- Positive
5 months later........

Chronic ulcer at left thigh

Human pythiosis insidiosi
- Cutaneous pythiosis
- Vascular pythiosis
- Ocular pythiosis

41-year-old female with thalassemia

41-year-old female with thalassemia

Pythium insidiosum antibody- Positive
A 45 years old alcoholic man

- What is the appropriate antibiotic treatment?
  A. Penicillin
  B. Ceftriaxone
  C. Penicillin plus clindamycin
  D. Vancomycin
  E. Vancomycin plus ceftriaxone

Vibrio vulnificus

A 36 year old woman with septic shock

- What is the appropriate antibiotic treatment?
  A. Penicillin
  B. Ceftriaxone
  C. Penicillin plus clindamycin
  D. Vancomycin
  E. Vancomycin plus ceftriaxone

Necrotizing fasciitis

- Type I: polymicrobial (mixed aerobes/anerobes)
  Risk factors: DM, decubitus ulcer, trauma

- Type II: Monomicrobial
  - Group A streptococcus (Streptococcus pyogenes)
  - Vibrio vulnificus
  - Aeromonas hydrophila

  Risk factors: Trauma (GAS), salt water exposure (Vibrio spp.), fresh water exposure (Aeromonas spp.), chronic liver diseases

A 40 years old man

- Anti-HIV positive
- Low grade fever for 3 months
- What is the diagnosis?
  A. Disseminated TB
  B. Oral condyloma acuminata
  C. Oral hairy hyperplakia
  D. Histoplasmosis
  E. Hypertrophic candidiasis

Oral Lesions in HIV-Infected Patients

Gram stain

Intracellular oval-shaped budding yeast compatible with Histoplasma capsulatum
Treatment

- Itraconazole 400 mg/day
- CD4 = 46/mm³
- When and what to start ARV?

When to start ARV?

- History of AIDS-defining illness (AI)
- CD₄ < 350 cells/mm³ (AI)
- CD₄ 350-500 cells/mm³ (A/B-II)
- CD₄ >500 cells/mm³ (B/C-III)

Initiation in these groups, regardless CD₄
- Pregnant women (AI)
- Patient with HIV-associated nephropathy (A-II)
- HIV co-infected with HBV when Rx indicated (A-III)

DHHS; January 10, 2011

What regimen?

Preferred
NNRTI-based Regimen
- EFV/TDF/FTC (AI)**

PI-based Regimens
- ATV/r + TDF/FTC (AI)
- DRV/r (once daily) + TDF/FTC (AI)

INSTI-based Regimen
- RAL + TDF/FTC (AI)

Preferred Regimen for Pregnant Women
- LPV/r (twice daily) + ZDV/3TC (AI)

Drug interaction
- NNRTI ↑ & Itraconazole ↓
- PI ↑ & Itraconazole ↑

FTC vs 3TC can be used interchangeably
- FTC; Emtricitabine
- 3TC; Lamivudine
- EFV; Efavirenz
- TDF; Tenofovir
- ATV; Atazanavir
- DRV; darunavir
- LPV; Lopinavir
- r; ritonavir-boosted
- RAL; Raltegravir

A 21-year-old man, HIV-positive, CD₄ 25 cells/mm³

Which of the following is true?

- A. The diagnosis is Kaposi sarcoma
- B. The differential diagnosis includes bacillary angiomatosis
- C. The causative organism is HHV8
- D. Treatment includes chemotherapy and ARV
- E. All of the above

Bacillary angiomatosis

Bartonella quintana, Bartonella henselae
A 86-year-old female presented with fever and hypotension.

What is the diagnosis?

- A. Ecthyma
- B. Ecthyma gangrenosum
- C. Pyoderma
- D. Pyoderma gangrenosum
- E. I am confused with the terminology!

Ecthyma vs. Ecthyma gangrenosum

<table>
<thead>
<tr>
<th>Ecthyma</th>
<th>Ecthyma gangrenosum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shallow, punched-out ulceration (deeper form of impetigo)</td>
<td>Gangrenous ulceration</td>
</tr>
<tr>
<td>Group A beta-hemolytic streptococci</td>
<td>Pseudomonas aeruginosa</td>
</tr>
<tr>
<td>Gram-positive cocci</td>
<td>Gram-negative rod</td>
</tr>
<tr>
<td>Lower extremities Anogenital and axillary areas</td>
<td>Anogenital and axillary areas</td>
</tr>
<tr>
<td>Rarely leads to systemic symptoms or bacteremia</td>
<td>A high mortality rate</td>
</tr>
</tbody>
</table>

Etiologies of ecthyma-like lesions

- Gram-positive bacteria
  - Staphylococcus aureus
  - Streptococcus pyogenes
- Fungi
  - Aspergillus fumigatus
  - Candida albicans
  - Curvularia species
  - Exserohilum species
  - Fusarium solani
  - Mucor and Rhizopus species
  - Pseudallescheria boydii
  - Scopulariopsis dimidiatum
- Gram-negative bacteria
  - Aeromonas hydrophila
  - Burkholderia cepacia
  - Chromobacterium violaceum
  - Citrobacter freundii
  - Corynebacterium diphtheriae
  - Escherichia coli
  - Klebsiella pneumoniae
  - Morganella morganii
  - Nesteria gonorrhea
  - Pseudomonas aeruginosa
  - Pseudomonas alcaligenes
  - Serratia marcescens
  - Vibrio vulnificus
  - Yersinia pestis
  - Xanthomonas maltophilia

A 30-year-old male with AML and prolonged chemotherapy-induced neutropenia.
A 30-year-old male with AML and prolonged chemotherapy-induced neutropenia

Questions

What is the most likely organism?
- A. Staphylococcus aureus
- B. Streptococcus pyogenes
- C. Aspergillus fumigatus
- D. Fusarium solani
- E. Trichosporon asahii

What is the diagnosis
- A. Ecthyma
- B. Ecthyma gangrenosum
- C. Pyoderma
- D. Pyoderma gangrenosum
- E. No idea

Disseminated Fusariosis

Skin lesions found in 60-80% and positive blood culture is common (50%)

Diagnosis
- Positive beta-D-glucan but negative galactomannan
- Skin biopsy: septate hyphal elements
  - Resemble Aspergillus organisms
  - H&E: Difficult to see
  - GMS, PAS: Helpful
- Culture:
  - Skin biopsy culture
  - Positive blood culture about 50%

A 25-year-old neutropenic male with AML S/P HSCT

What is the most likely causative organism?
- A. P. aeruginosa
- B. S. aureus
- C. Candida spp.
- D. Aspergillus spp.
- E. B. pseudomallei

A 30 year old female, SLE with prolonged steroid use

A 30 year old female, HIV’s

A 50 years old male, AML post chemotherapy
What are the etiologic organisms?

- A. Staphylococcus aureus, Penicillium marneffei, Candida albicans
- B. Penicillium marneffei, Candida albicans, Staphylococcus aureus
- C. Candida albicans, Staphylococcus aureus, Penicillium marneffei
- D. Nocardia asteroides, Histoplasma capsulatum, Aspergillus fumigatus
- E. Aspergillus fumigatus, Penicillium marneffei, Candida albicans

A 30 year old female with SLE and steroid use

A 30 years old female HIV+

Binary fission

HIV with skin lesion

Dome-shaped
Skin-colored papules
Erythematous base
Central umbilication

Differential diagnosis

Cryptococcus neoformans
Histoplasma capsulatum
Molluscum contagiosum virus

Bone marrow aspiration
A 50 years old male, AML post CMT

Hepatosplenic candidiasis

A young man, ALL post chemotherapy

Acute Disseminated Candidiasis: Cutaneous Manifestations

What causative organism is unlikely?
- A. Candida albicans
- B. Fusarium spp.
- C. Pseudallescheria boydii
- D. Trichosporon spp.
- E. Penicillium marneffei

A young man, ALL post chemotherapy

Bone marrow and skin biopsy show as below (Gram stain)

What is the most likely causative organism?
- A. Candida albicans
- B. Fusarium spp.
- C. Pseudallescheria boydii
- D. Trichosporon spp.
- E. Penicillium marneffei
A 65 years old woman
Diabetes
Fever for 2 weeks
Restless, dyspnea
Left knee pain
Meningeal signs
A. Group A streptococci
B. Group B streptococci
C. Group C streptococci
D. Group D streptococci
E. MSSA

Hemoculture: Streptococcus agalactiae

A 25 years old female
Fever 1 week
Pain at right hand

A. Group A streptococci
B. Group B streptococci
C. Group C streptococci
D. Group D streptococci
E. MSSA

A 38 years old woman
Fever with neck pain for 4 days
History of sore throat 10 days ago
What is the causative organism?
A. a Gram-positive rod
B. a Gram-negative rod
C. a Gram-negative cocci
D. a fungus
E. a virus

What would you expect to see in a her pus Gram’s stain?
Neisseria gonorrhoeae
Moraxella catarrhalis
Acinetobacter baumannii
Streptococcus pneumoniae

A 38 years old woman
Fever with neck pain for 4 days
History of sore throat 10 days ago
What is the causative organism?
A. a Gram-positive rod
B. a Gram-negative rod
C. a Gram-negative cocci
D. a fungus
E. a virus

Lemierre syndrome
- Uncommon fulminant infectious disease caused by Fusobacterium necrophorum
- Healthy adolescents with an oropharyngeal infection and rapidly progresses to suppurative thrombophlebitis of the internal jugular vein
- Metastatic foci of infection to the lungs
- Treatment with penicillin, metronidazole, or clindamycin and appropriate surgical intervention.

Two men with swelling feet
What organism is unlikely?

- B. *Pseudallescheria boydii*
- C. *Nocardia* spp.
- D. *Actinomyces* spp.
- E. None of the above

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**Mycetoma and Actinomycosis**

**Mycetoma**
- Eumycetoma
  - *Pseudallescheria boydii* (most common)
- Actinomycetoma
  - *Nocardia* spp.
  - *Actinomadura madurae*

**Actinomycosis**
- *Actinomyces israelii*

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**Actinomycosis**

- *Gram and partial acid fast stain stain*
  - Gram positive branching filament
  - Modified acid fast positive branching filament

- *Nocardia* spp., *Actinomyces* spp.

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**A 35-year old male**

- Fever with productive cough and dyspnea for 3 weeks, headache, OC +, OHL +

- Sputum Gram’s stain

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**Modified acid fast stain**

- What is the causative organism?
  - A. *Rhodococcus equi*
  - B. *Cryptosporidium parvum*
  - C. *Microsporidia*
  - D. *Candida* spp.
  - E. *Penicillium marneffei*
Gram’s stain

- What is the causative organism
  - A. *Mycobacterium tuberculosis*
  - B. *Klebsiella pneumoniae*
  - C. *Nocardia* spp.
  - D. Amoeba
  - E. Cytomegalovirus

Gram neutral and positive acid fast stain

A man with HIV and chronic diarrhea

<table>
<thead>
<tr>
<th>20x30 micron</th>
<th>8-10 micron</th>
<th>4-6 micron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryptosporidium parvum oocyst</td>
<td>Rx Bactrim 2x4 (10 days)</td>
<td>Isospora belli oocyst</td>
</tr>
<tr>
<td>Cyclospora cayetanensis oocyst</td>
<td>Rx Bactrim 2x4 (10 days)</td>
<td>Cryptosporidium parvum oocyst</td>
</tr>
<tr>
<td>Rx ARV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Gram and modified acid fast stain

G + & MAFB + branching bacilli → *Nocardia*
G + & MAFB - branching bacilli → *Actinomyces*
G + & MAFB + coccobacilli → *Rhodococcus*
G-neutral & MAFB + & AFB + → *Mycobacterium*
G-neutral & MAF + cyst → *Cryptosporidium parvum, Isospora belli*
What is the diagnosis?

- A. Infective endocarditis
- B. Leptospirosis
- C. Dengue hemorrhagic fever
- D. Gram-negative sepsis with DIC
- E. Scrub typhus

A 18 years old male, no underlying disease

- A 20 years old female with fever for 2 weeks

A 20 years old female with fever for 2 weeks

What is the diagnosis?

- A. Infective endocarditis
- B. Leptospirosis
- C. Dengue hemorrhagic fever
- D. Gram-negative sepsis with DIC
- E. Scrub typhus

What is the causative organism?

- A. Gnathostoma spinigerum
- B. Ancylostoma braziliense
- C. Toxocara canis
- D. Strongyloides stercoralis
- E. Choice B and D are correct
Larva migrans
- Migratory swelling
  - Gnathostoma spinigerum
- Cutaneous larva migrans (creeping eruption)
  - Ancylostoma braziliense
  - Ancylostoma caninum
- Larva currens = a form of cutaneous larva migrans
  - Strongyloides stercoralis
- Visceral larva migrans
  - Toxocara canis
  - Toxocara cati

A 45 years old female, DM
- What is the diagnosis?
  - A. TB lymphadenitis
  - B. Actinomycosis
  - C. Melioidosis
  - D. Nocardiosis
  - E. Disseminated gonococcal infection

A 50-year old man
- Fever and weight loss for 2 months
- Generalized lymphadenopathy
- Hepatosplenomegaly
- Painful skin lesions (as shown)

What organism would you expect from skin biopsy?
- A. Positive AFB
- B. a Gram-negative rod with bipolar staining
- C. Positive modified AFB branching filament
- D. a Gram-positive rod with spore
- E. Not found any organism

Sweet’s syndrome
(acute febrile neutrophilic dermatosis)
- Asymmetrical distribution
- Tender/painful erythematous papules or nodules
- Confluent into plaques (circinate or annulate appearance)
- Occasionally with vesicles, pustules, or bullae
- Not pruritic
- Extremities, face, neck (uncommon at dorsum of hand)

Differential diagnosis
- Erythema multiforme
- Erythema nodosum
- Pyoderma gangrenosum
- Drug eruption
- Urticaria
- Herpes simplex
- Behcet disease
**DDx for etiology of Sweet’s syndrome**
- Classic or idiopathic Sweet’s syndrome (>50%)
- Malignancy
  - Hematologic: MDS, CML, AML, lymphoma
  - Non-hematologic: GI, GU, breast
- Infection:
  - Mycobacterium: *rapid grower*, TB and other NTM (rare)
  - Streptococcal pneumonia, *Salmonella*, *Staphylococcus*, *Yersinia*, *Penicillium*
  - HIV, CMV, HBV, HAV
- Drug-induced
  - Co-trimoxazole, minocycline, all-trans retinoic acid, furosemide, carbamazepine, hydralazine, COX2-inhibitors, PTU, etc.
- Systemic disorder
  - Cohn disease, ulcerative colitis, SLE, RA, connective tissue diseases

**Psoriasis-like lesion in NTM infection**
- IFN-gamma autoantibody- positive

**Non-tuberculous mycobacteria**
- Rapidly growing mycobacteria
  - (< 7 days on LJ agar)
    - *M. abscessus, M. chelonae, M. forfuitum*
- Slowly growing mycobacteria
  - (> 7 days on LJ agar)

**Clinical features**
- **MAC**
  - Disseminated infection in HIV, pulmonary diseases
  - Treatment: clarithromycin/azithromycin, ethambutol, rifampicin, ciprofloxacin
- **M. kansasii**
  - Pulmonary diseases mimicking TB (involvement of upper lobe)
  - Extrapulmonary infections uncommon: meningitis, cutaneous, disseminated (HIV)
  - Not contagious from person to person
  - Treatment: I, R, E (resistant to PZA)

**Mycobacterium marinum**
- Fish-tank granuloma
- Skin lesions: single, multiple
- Clusters of superficial nodules or papules, erythematous plaque
- Painful or painless
- Swimming pool-related: elbows, knees and feet
- Aquarium owners: hands and fingers

**A 48-year-old HIV positive developed neck mass 4 months TB and ARV treatment**
- What is the likely diagnosis?
  - A. Disseminated cryptococcosis
  - B. Recurrent TB
  - C. Immune reconstitution inflammatory syndrome (IRIS)
  - D. Melioidosis
  - E. Non-tuberculous mycobacterial infection
A 60 year old man with AML post CMT

What is the most likely diagnosis?
- A. Aspergillosis
- B. Fusariosis
- C. Zygomyces
- D. Pseudallescheriasis
- E. Candidiasis

Air crescent sign

Halo sign: differential diagnosis

<table>
<thead>
<tr>
<th>Infectious diseases</th>
<th>Non-infectious diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungus: aspergillosis, mucormycosis, candidiasis, eocidiulomyces, cryptococcosis</td>
<td>Malignancy: primary, metastatic</td>
</tr>
<tr>
<td>Septic embolism</td>
<td>Wegener's granulomatosis</td>
</tr>
<tr>
<td>Mycobacteria; TB, MAC</td>
<td>Eosinophilic lung disease; parasitic infestation</td>
</tr>
<tr>
<td>E. coli, Campyella burnetti</td>
<td>(schistosomiasis), simple pulmonary eosinophilia, hypersensitivity pneumonitis</td>
</tr>
<tr>
<td>Virus: herpes simplex virus, variella-zoster virus, CMV, myxovirus</td>
<td>Pulmonary endometriosis</td>
</tr>
<tr>
<td></td>
<td>Organizing pneumonia</td>
</tr>
<tr>
<td></td>
<td>Hypersensitivity pneumonitis</td>
</tr>
</tbody>
</table>

Halo sign: Invasive mold infections

Lee YK. Br J Radiol 2005;78:826-5
A 65 years old alcoholic man with meningitis

What is the causative organism?
- A. Bacillus anthracis
- B. Erysipelothrix rhusiopathiae
- C. Clostridium perfringens
- D. Listeria monocytogenes
- E. Corynebacterium jeikeium

A 28 years old man

What organism should be covered by antimicrobial treatment?
- A. Capnocytophaga canimorsus
- B. Eikenella corrodens
- C. Pasteurella multocida
- D. Nocardia brasiliensis
- E. Mycobacterium chelonae

Clenched fist injury

- Eikenella corrodens
- Resistant to cloxacillin, clindamycin and first generation cephalosporin
- Same as human bite
- Cat bite
- Pasteurella multocida
- Resistant to cloxacillin, clindamycin and first generation cephalosporin

Thank you for your attention

GOOD LUCK IN YOUR BOARD EXAM !!!!!!!!