“Symposium on Immunogenic and Infectious Keratitis”

Farid Karimian M.D

Department of Ophthalmology

Labbafinejad Medical Center

XVth Congress of Iranian Society of Ophthalmology
October 2005

Definition of Ulcer

- " A lesion caused by superficial loss of tissue, usually with Inflammation"
- *Important questions*

  * Is there an exogenous agent causing the Keratitis?
  * Which local factors have increased risk for ulceration?
  * Are there any endogenous factors?

Diagnosis (1)

- ***First decision:*** **is ulcer infectious or sterile?**
- ***Historical predisposition*****:**
  - *** Contact lens use (EW>DW)**
  - *** Foreign bodies**
  - *** Trauma**
  - *** Previous ocular surgeries, Refractive Surgeries**
  - *** Exposure to contaminated water**

Diagnosis (2)

- *Impaired Local Host Defences :*
  - H/O ocular chemical injury
  - Neurotrophic disease
  - Exposure and lid or lash malposition
  - Tear insufficiency
  - Ocular Surface Disease
  - Bullous Keratopathy
  - Previous Herpetic Disease
  - Topical Steroid or Anesthetic use

Systemic Risk Factors

- Diabetic Mellitus
- Malnutrition
- Chronic Debilitating Disease
- Auto-immune disease and immuno-suppressive treatment
- Immunodeficiency diseases: AIDS
- Mucous membrane disease: OCP, SJS, Scleroderma, Atopic dermatitis

Indications for Culture

- In nearly all cases of moderate to severe microbial keratitis
- Essential part of evaluation
- Method: * Performed at slit lamp
  * Topical anesthetic (propracaine) preferred
  * Kimura platinum (blunt) spatula
  * Slides & cultures from different depths and sites of ulcer
  * Kimura sterilization by Bunsen burner between scrapings
  * Other devices: Bard- Parker # 57, # 15 Blades hypodermic needle

Corneal Biopsy

- ***Indications:***
  - * Non conclusive cultures with progressive ulcers
  - * Deep stromal lesions, intact overlying stroma, dry infiltrates
- ***Technique:***
  - * At slit lamp under topical anesthesia
  - * Size: 3-5mm circular trephine, depth 150-250μ
  - * Edge lifted and removal by dissection
  - * Scraping of dissection base
  - * Biopsy specimen bisected: histologic analysis, culture

Diagnostic Stains

Stain	Organism visualized
Gram Stain	Bacteria
Acridine Orange	Bacteria, Fungi, Acanthameba
Calcofluor white	Mycobacteria (weak) Fungi, Acanthamoeba
Acid fast (Ziel- Neelsen)	Mycobacteria

Fluoro-Chromatic Stains (Acridine orange and Calcofluor white)

- Require epifluorescence microscope
- Detects a wide variety organisms
  - * G^+ and G^-- bacteria
  - * Fungi (Yeast and hyphal forms)
  - * Acanthamoeba (Cyst and trophozoite)
- Acridine Orange: predicts culture results: 71%-84%
  (Gram stain prediction of culture results: 62%to 79%)
- Calcofluor white: stains fungi and acanthamoeba

Culture media

Medium	Organism can be cultured
Standard media	
Blood agar plate	Aerobic and Anaerobic bacteria, fungi
Chocolate agar plate	Aerobic and Anaerobic bacteria, Neisseria, Hemophilus
Saboraud agar plate with gentamicin	Fungi
Thioglycollate broth	Aerobic and Anaerobic

Additional Culture Media

Culture Media	Organism can be cultured
BHI broth with gentamicin	Fungi
Lowenstein – Jensen	Mycobacteria
Middle Brook agar slant	
Schaedler's agar plate	Anaerobic bacteria
Brucella agar plate	
Thayer- Martin agar plate	Neisseria
Non nutrient agar plate with killed E-coli overlay	Acanthamoeba

Culture Taking

- Direct inoculation onto culture medium can improve yield
- C-streak inoculation facilitates contaminant growth
- Inoculation into thioglycolate broth by calcium alginate or moistened (with trypticase soybroth) cotton swab
- Antimicrobial Removal Device (ARD) is of sterile resins capable of binding a wide variety of antibiotics
- ARD can be used to increase the likelihood of obtaining positive cultures

The Four Principal Groups of Bacteria

- Staphylococcus, micrococcus
- Streptococcus sp.
- Pseudomonas sp.
- Entrerobacteriaceae (Citrobacter, Klebsiella, Enterobacter, Serratia, Proteus)