

Management of Bacterial CORNEAL ULCERS

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Introduction

- Break in corneal integrity with underlying stromal infiltrate
- Significant cause of visual impairment
- Infection is mainly responsible in majority cases

Etiology

- Almost any organism can invade cornea if corneal defense mechanism compromised
- Lid abnormality
- Tear Film abnormalities
- Compromised corneal epithelium
- Developed countries- Viral infection
- Developing countries- Bacterial, Fungi, Acanthamoeba
- In a study - 71.9% culture positive
- 63.9% - Bacterial , 2.1% - Parasitic
- 33% - Fungal , 6.2% - Mixed infection

Organisms Profile

- Gram + cocci
 - Staph. Epidermidis (32.4%), Strept. Pneum(13.1%)
 - Staph aureus(7.6%).
- Gram + Bacilli
 - Corynebacterium(13.9%)
- Gram - Bacilli
 - Pseudomonas(11.1%)
- Fungal
 - Aspergillus(33%), Furarium(35.1%)
- Parasite
 - Acanthamoeba

Probable Etiological Diagnosis

- No Distinctive sign to identify responsible organism
- Gram + cocci
 - Localized round & oval ulceration
 - Grayish white stromal infiltrate with distinct border
 - Minimal surrounding haze
- Gram - bacilli
 - Rapid inflammatory destructive course
 - Dense stromal suppuration
 - Hazy surrounding cornea with ground glass appearance
- Fungal Keratitis
 - Dry raised slough
 - Stromal infiltrate with feathery edge
 - Satellite lesion
 - Thick endothelial exudates
- Acanthamoeba
 - Epithelial irregularities, single or multiple
 - Stromal infiltrate
 - Classical ring shaped configuration
 - Severe pain & keratoneuritis

LAB Investigations

Routine systemic investigation

Smears (Staining)

- Conjunctiva, Sac -- Gram + Geimsa,
- Corneal ulcer(from scraping) -- Gram, Geimsa, KOH, Methenamine silver stain, calcoflour white fluorescent dye
- Culture for Corneal ulcer [protocol]
- Lid margin -- BI Agar, En chocolate agar
- Conjunctiva -- BI Agar, En chocolate agar
- Sac -- BI Agar, Br Ht infusion
- Anaerobic -- Thioglycate, CO2 media

Corneal ulcer (Scrapings)

- Moist swab culourette
- Klmura spatula- BI Agar, En chocolate agar, Sabouraud's media, Br Ht infusion

A study shows - Despite a tendency towards favorable results in culture positive corneal ulcers, the influence of detection of organism on their outcome has not been proved. The role of initial antibiotics therapy remain important.

Treatment

Local

Mono-therapy drops - Fluoroquinolones, Aminoglycosides, Tetracyclines, Chloramphenicol

Fortified antibiotics drops - Cephalosporins, Macrolides, glycopeptides, Lincomycin

Lubricating eye drops

Cycloplegics (Atropine)

Oral

Penicillins, Tetracyclins, Sulphonamides

Sub-conjunctival Injection

Aminoglycosides, Fluoroquinolones

Microbiological investigation always done in following-

Severe ulcers (rapidly progressing infiltrate >6 mm)

Involving deeper stroma

Associated with imminent or actual perforation

Cases with H/O & clin. Exam suggestive of unusual pathogen

Supplementary t/t -

Cycloplegic agents

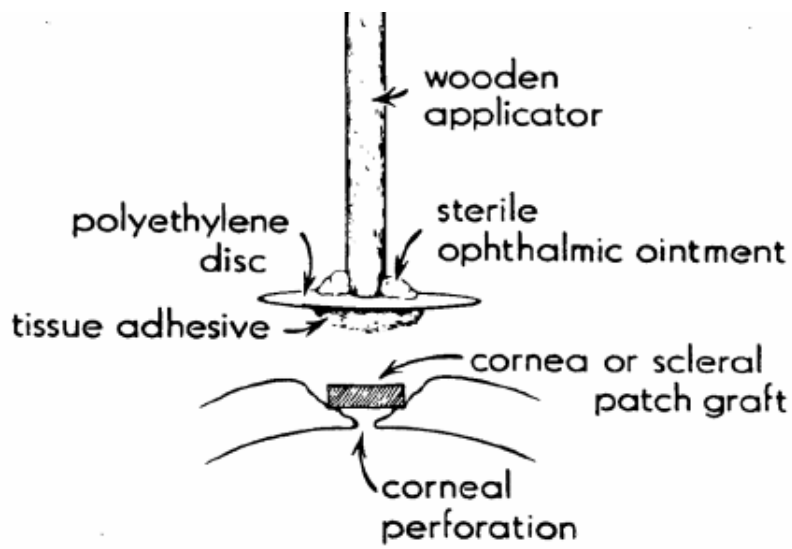
Antiglaucoma agents

Oral analgesics

Surgical t/t

Debridement of necrotic debris

Tissue adhesives with bandage contact lens

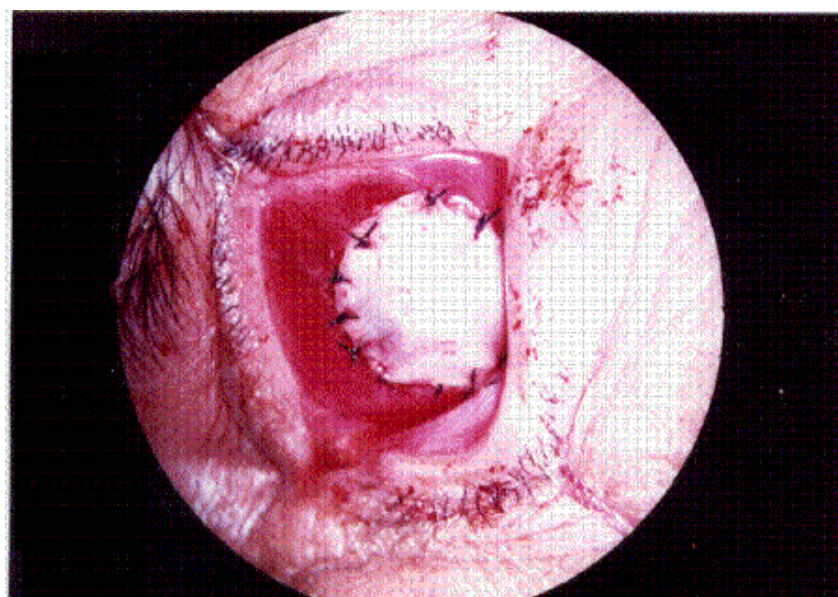


Amniotic membrane graft

Conjunctival flap



Mucous membrane flaps



Lamellar & Penetrating keratoplasty

Table: Anti-biotics used in the treatment of Corneal Ulcers:

ANTIMICROBIALS USED IN OPHTHALMOLOGY	DOSES		INTRAVITREAL		SHELF LIFE
	TOPICAL (FORTIFIED DROPS)	SUBCONJUNCTIVAL	DOSE IN mg/ml	INFUSION FLUID CONC. IN mcg/ml	
Cephaloridine	50 mg/ml	100 mg/0.5 ml	0.25/.01	8	1 Week (R)
Cephalexime	50 mg/ml	50 mg/0.5 ml	0.25/.01	8	1 Week (R)
Cephazolin	50 mg/ml	100 mg/0.5 ml	NE	NE	1 Week (R)
Gentamicin	20 mg/ml	20 mg/0.5 ml	0.4/0.1	8	30 Days (Rmt)
Tobramycin	20 mg/ml	20 mg/0.5 ml	0.5/0.1	10	30 Days (Rmt)
Carbenicillin	4 mg/ml	125 mg/0.5 ml	2.0/0.1	20	1 Week (R)
Erythromycin	5 mg/gm oint	100 mg/0.5 ml	0.5/0.1	8	—
Penicillin G	0.15 to 0.30 lac IU/ml	0.5 to 1.0 lac IU/ml	2.0/0.1	100	24 Hours
Sisomicin	20 mg/ml	20 mg/0.5 ml	0.4/0.1	8	30 Days (Rmt)
Amikacin	10 to 20 mg/ml	25 mg/0.5 ml	0.4/0.1	10	30 Days (Rmt)
Kanamycin	10 mg/ml	25 mg/0.5 ml	0.5/0.1	8	NE
Ampicillin	10 mg/ml	50 to 100 mg/0.5 ml	5.0/0.1	20	NE
Chloramphenicol	5 to 10 mg/ml	50 mg/0.5 ml	2.0/0.1	10	NE
Amphotericin B	5 to 10 mg/ml*	2 to 3 mg/0.5 ml	.005 to .010/0.1	5	1 Week (R)
Miconazole	10 mg/ml	20 mg/0.5 ml	.025 to .05 mg/0.1	10 mcg	1 Week (R)

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