CORNEAL ULCER : MANAGEMENT PROTOCOL

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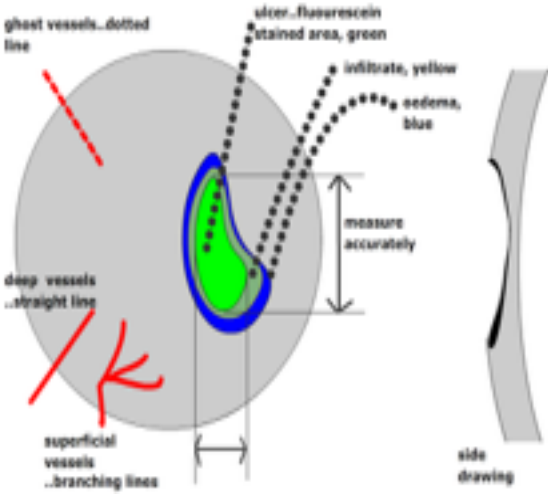
1: HISTORY: Trauma, Foreign body, Contact lens wear, Previous therapy, previous eye problems (irritation, watering, grittiness).
MEDICAL HISTORY: Known TB, Diabetes, Hepatitis C, on any prolonged drug therapy for any general problem.

2: EXAMINATION:
General Health : looks healthy / malnourished / pale complexion?
Any scars / marks of previous Herpes Simplex ? Zoster ? Molluscum.
Ophthalmic Examination:
VA.
Lids: positioning in contact to globe, trichiasis, distichiasis, MGD, ectropion / entropion, punctae.
Conjunctiva, Evert upper lid and check upper tarsal conjunctiva for concretions, papillae, foreign body, Follicles, Congestion, chemosis.
Lower tear meniscus: normally is 2mm high, whether clear or with discharge, debris.
Lacrimal Sac compression to see regurg of pus/mucus.
CORNEA:



- Presence of an ulcer or an Abscess (overlying epithelium intact).
- Site of Ulcer, surrounding infiltrate, vascularisation,
- Check Corneal Sensation with a wisp of cotton wool.
- Measure dimensions and DRAW in clinical notes, Epithelial defect (staining area), surrounding infiltrate (whitish).
- Hypopyon, Anterior chamber depth, its clarity, cells/ flare/ fibrinous exudate (fungal ulcer).
- Pupil: freely mobile / synaechia
- Lens: clarity, intumescent.
- Vitreous: clear or with cells in anterior vitreous.
- Disc: is visible, normal or cupped. Remaining retina if visible.
- IOP: Non-contact or palpatory.

(Fungal ulcer looks Dry, clean tear film meniscus, with no surrounding corneal vascularisation, 1-more satellite lesions, feathery margin, surrounding cornea clear)

DO NOT FORGET TO EXAMINE THE OTHER EYE.

INVESTIGATIONS:

If no predisposing factor found in history or examination that can cause Corneal Ulcer, must investigate regarding TB, Diabetes, Hepatitis C.

Microdot Test for TB

Hb A1C (Diabetes and its status)

Hepatitis C antibody titre.

CBC, ESR: for any underlying chronic systemic illness.

Corneal scape or take exudate from ulcer margin, put a drop of distilled water on a slide and see under microscope for FUNGAL HYPHAE.

GRAMS & KOH STAINING of scarped material (if possible).

THERAPY:

IN CLINIC:

A: Painting the Ulcer with Pyodine 5% Solution. Apply cotton swab soaked in Pyodine over the ulcer area. If there is a lot of slough, then remove it with the side of a 23 G needle or a spatula or fine scissors, and then apply Pyodine for 5 min. You don't need to put local anaesthetic drops as they are toxic to already damaged cornea.

B: Loading Dose of Topical Broad Spectrum Antibiotic (4th generation Fluoroquinolone) 1 drop every 5 min for 1 hour, in the clinic.

C: Full Pupil Dilatation with Cyclopen/ atropine/ mydracyl/isonephrine eyedrops, one drop every 10 min. If Pupil doesnt dilate with this, then inject Mydricaine inj in bulbar conjunctiva in 3 quadrants.

Inj Mydicaine preparation: In a 1 cc syringe take: 0.1 cc atropine (from atropine injection) + 0.1 cc adrenaline (from its injection) + 0.1 cc xylocaine.

D: IOP lowering with topical beta blockers. Tab acetazolamide indicated in case of very shallow anterior chamber depth or descemetocele formation.

ONCE STEPS A, B, C, D HAVE BEEN COMPLETED IN THE CLINIC, AND PATIENT'S CARE-TAKER HAS BEEN EXPLAINED REGARDING THE SERIOUSNESS OF THE CONDITION, AS WELL AS THE NEED FOR CLOSE FOLLOW-UP, ONLY THEN THE PATIENT SHOULD BE ALLOWED TO LEAVE THE CLINIC WITH THE FOLLOWING THERAPY:

E: PATIENT'S PRESCRIPTION:

1: Moxifloxacin eyedrops hourly, day and night.
2: Tobramycin eye ointment at night.
3: If ulcer is peripheral, then add oral antibiotic too.
NOTE: no need to add anti-fungal therapy at this stage if no predisposing factors.

(**If a definite history of trauma, or typical fungal ulcer:**
1: Fluconazole eyedrops every hour. (Inj Diflucain 5 ml taken with syringe and injected into an empty eyedrops bottle and dispensed.)
2:Natamycin eye ointment 3x
3: Itraconazole Tab 100 mg: 2 tab stat, then one tab twice daily for 2 months.
Note; In fungal ulcer with corneal epithelium intact, natamycin is OK. But it has no penetration into corneal storm or anterior chamber, so Fluconazole or Voriconazole is indicated.)

4: Atropine 1% eyedrops once a day.
5: Propranolol eye drops twice daily.
6: Tab. Vitamin C 1000 mg dissolved in half glass water daily.
7: Regular cleaning of eyelids in the morning.
8: Tetracycline eye ointment (Xinoxy) massaged into lid margins at night (for MGD).
9: Oral Cap. Doxycycline 100 mg daily after breakfast for 2 months.
10. Inj Vitamin D (Inderop) mixed in quarter glass water and drunk once a month.

FOLLOW-UP: Patient called for examination after 48 hours (A MUST) and assessed:

A: SUBJECTIVELY:
1: Eye Pain and headache should have reduced without any oral analgesics.
2: Watering reduced.

B: OBJECTIVELY:
1: Lid swelling should have reduced.
2: Conjunctival congestion, chemosis reduced.
3: Siedel test must be done at each visit for cases with an initial corneal thinning or descemetocele.
4: Anterior chamber activity much reduced.

NOTE: If at 48 hours visit, none of the above signs are present, then a cause for the poor response to therapy must be sought!!!! Each of the following parameters need to assessed and addressed.

- **Inappropriate Therapy: look for signs of Fungal Infection if initially only antibiotics have been started. If so, antibiotics need to be reduced to 4x daily and antifungals added hourly.**
- **MUST PAINT THE ULCER WITH PYODINE.**
- **Must check if pupil is fully dilated. If not, do it in the clinic as mentioned above.**
- **Check the IOP: palpatory.**
- **Non-compliance to Therapy: must see all the medications patient is using. Must check how is he or the care-taker instilling eyedrops. Teach them to instil only one eyedrops by tilting the bottle while the patient is sitting and not lying down. The patient should either keep eyes open for a minute or gently close, without squeezing lids. Interval between 2 eyedrops should be 5-10 minutes.**
- **Inflammatory reaction progressively damaging storma (MMP, Collagenases). Add anticollagenases: Acetylcysteine eyedrops 4x.**
- **Slough: preventing access of antibiotics / antifungals deep to the slough. It should be derided with either a pair of fine scissors (if it is too thick), or removed with a 23 G needle with its edge, scraping it from above downwards. After removing the slough, pyodine is applied to the ulcer base.**
- **Antibiotic, Preservative Toxicity.**
- **Consider MRSA (resistant Staph infection) infection: in hospitalised or immunosuppressed patients, if previously used topical antibiotics: the causative organisms will respond more to old antibiotics like Chloramphenicol, Sulfacetamide, Erythromycin, Gentamycin.**

IF PATIENT IS IMPROVING, CONTINUE WITH THE SAME THERAPY. CALL FOR FOLLOW-UP EVERY 2nd DAY TILL ULCER SHOWS SIGNS OF HEALING: eye getting white, watering and pain disappeared, Epithelial defect reducing, surrounding cornea getting clearer, AC activity disappeared.

<u>BY 10-14 DAYS, A BACTERIAL ULCER GETS STERILISED. AT THIS POINT TREATMENT NEEDS TO BE ALTERED:</u>

1; Topical Antibiotics stopped.
2: Eyelid therapy with scrubbing with baby shampoo, tetracycline eye ointment massage to lid margins, and oral Doxycycline continued.
3: If antifungals were started, they need to be continued.
4: Atropine eyedrops continued.
5: Propranolol eyedrops continued till central corneal thickness restored.
6: Add: Tacrolimus skin cream/eye ointment (Ecczemus skin cream 0.03%) applied inside lower conjunctival fornix twice daily.
7: Cyclosporin 0.5% eyedrops (freshly prepared) twice daily. Both Tacrolimus and Cyclosporin eyedrops have an additive affect.
8: Topical Lubricants: preferably Tears Plus, Natural Tears 4x
9: Lubricant eye ointment at night (Lacrilube).
10: Continue improving general health and immunity of the patient with good diet, rest, fresh air, Vitamins A, C, D, B12 orally.

CONTINUE THIS THERAPY WITH A WEEKLY FOLLOW-UP TILL ULCER FULLY HEALED, AND SCAR GRADUALLY REDUCES IN THICKNESS. MAY TAKE 3-6 MONTHS.