A little more than your everyday corneal abrasion

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Abstract: A case report describing atypical wound healing characterized by fluctuating corneal curvature and permanent refractive error changes following a corneal abrasion in a patient with a history of radial keratotomy and automated lamellar keratoplasty.

I. Case History
   a. 47 year old Caucasian female presented with a complaint of pain in the right eye which began after hitting her eye with a makeup brush during the application of eye makeup. The patient reported that the pain appeared suddenly 1 day prior to presentation to the clinic for an examination. The patient reported an accompanying decrease in vision of the right eye at distance and near.
   b. She had a history of radial keratotomy of the right eye and automated lamellar keratoplasty of both eyes performed 20 years prior to presentation. Medical history was remarkable for depression and Herpes Simplex.
   c. Patient reported taking Symbyax for depression.

II. Pertinent findings
   a. Clinical
      1. Distance VAs
         a. OD 20/40 -1 PH NI
         b. OS 20/40 -1 PH NI
         c. EOMs: FROM
         d. PERRLA; no APD
   b. Slit Lamp findings
      1. OD: Erythema of upper lid, diffuse injection of the bulbar conjunctiva
         a. Epithelia defect with branch like extensions with surrounding loose epithelium located between 6 RK scars and an ALK scar. Branch like extensions stained with sodium fluorescein
      2. OS: ALK scar, no staining with sodium fluorescein
      3. No evidence of a foreign body or a penetrating injury

III. Differential Diagnosis
   a. Herpes simplex virus
   b. Exposure keratopathy
   c. Corneal abrasion
d. Recurrent corneal erosion

IV. Diagnosis and discussion
a. Diagnosis
   1. Corneal abrasion
b. Discussion
   1. Corneal abrasions are often painful and debilitating. However, these ocular injuries usually heal relatively quickly and without complications. It is important to take into consideration a history of prior refractive surgery, as it may influence the patient’s healing process. A change in refractive error and corneal curvature after resolution of a corneal abrasion may occur in patients with a history of radial keratotomy and automated lamellar keratoplasty. A study conducted by Binder et al revealed the presence of delayed corneal wound healing following radial keratotomy. Changes in corneal structure elicited by refractive surgery may alter the typical wound healing process. The development of anterior stromal haze 3 days after treatment, as seen in our patient, differed from the normal course of recovery. A study conducted by Kohnen suggested that stromal regrowth, characterized by activation of keratocytes, presents clinically as haze. The remodeling of corneal tissue in our patient might have elicited haze formation and a subsequent myopic shift resulting in decreased VA.

V. Treatment and Management
a. Day 1
   1. Corneal debridement resulting in a 4mm x 3mm abrasion
   2. Bandage soft contact lens used. Prescribed Moxeza TID. Patient refused cycloplegic agent
b. Day 2: Patient reported worsening of pain, redness and reduction of vision.
   1. Distance VAs
      a. OD 20/80 PH NI
      b. OS 20/30 PH NI
   2. Contact lens was removed. Mucin balls, which dissipated after a few blinks, were noted at the edge of the remaining abrasion upon CL removal.
   3. Slit lamp findings
      a. OD: 3+ diffuse injection of the bulbar conjunctiva
      b. Edema surrounding a small central abrasion which stained with sodium fluorescein.
   4. Cyclopentolate was instilled OD
   5. OTC Muro 128 QHS OD and artificial tears q1h
c. Day 3: Patient reported significant improvement in pain and photophobia. Blurry vision of OD persisted.
   1. Distance VAs
      a. OD 20/70 PH 20/40.
   2. Slit lamp examination
      a. OD: diffuse anterior stromal haze in previous area of abrasion with no overlying staining with sodium fluorescein
      b. Discontinued Moxeza. Prescribed Alrex QID and Muro 128 QHS

d. Day 4: Patient reported worsening of vision OD
   1. Distance VAs
      a. OD 20/400 PH 20/40
   2. OD: diffuse anterior stromal haze with no overlaying staining
      a. Continue Alrex QID and Muro 128

e. Day 8: Patient reported stabilization of vision
   1. Distance VAs
      a. OD 20/200 PH 20/40
   2. OD: no corneal edema or anterior stromal haze present
   3. Refraction revealed a 2 diopter myopic shift in refractive error
      a. BCVA OD 20/30
   4. OD: Topography showed steepening of cornea by 2D compared to topography measured 7 months prior

f. Bibliography

VI. Conclusion
   a. It is important for practitioners to take into account a prior history of refractive surgery during the management of corneal abrasions. Prior refractive surgery may alter the healing process of the cornea, resulting in a temporary or permanent shift in refractive error and corneal curvature.