Practice patterns in the interdisciplinary management of corneal abrasions

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ABSTRACT ●

Objective: To characterize the treatment and follow-up patterns of corneal abrasions at an academic health centre.

Methods: This is a retrospective review of 90 cases of corneal abrasions over a 2-year period at a tertiary care academic hospital, of which 75 were seen by the ophthalmology department. All consultations primarily for corneal abrasion, as determined by the emergency department physician, were included in the study. Information on treatment regimen, corneal findings by emergency and ophthalmology physicians, time between follow-ups, and final outcomes was collected.

Results: Seventy-five patients were seen by ophthalmology a median of 1 day after the emergency room visit. Twenty-five of these patients did not arrive for their subsequent follow-up appointment. Twenty-two of the abrasions were healed by the time of the ophthalmology examination, 51 patients had unhealed corneal abrasions, and 2 had corneal ulcers. Management was changed in 29 of the patients by ophthalmology. The most common management changes were hypertonic saline ointment for prophylaxis or treatment of recurrent erosion syndrome, followed by bandage contact lenses for comfort.

Conclusions: Corneal abrasions are a common condition, and practice patterns for follow-up vary widely. Although the vast majority of patients do very well and likely would heal on their own without ophthalmology referral, it seems reasonable that patients with corneal abrasions are assessed once by an ophthalmologist immediately or possibly up to 1–2 days after the initial emergency visit, depending on the individual patient circumstances.

Corneal abrasions refer to the injury of the outermost layer of the cornea, the epithelium. They are one of the most common reasons for presentation to an emergency department.[1] Typically, corneal abrasions heal quickly and patients make a full recovery.[2] The healing process may take 24–72 hours, and healing takes the pattern of migrating epithelial sheets developing over the circumference of the defect, which progress toward the centre.[3] While typically a benign, if extremely painful, condition, the complications of corneal abrasions, such as infectious keratitis or recurrent erosion syndrome, may be severe. For that reason, patients with corneal abrasions are typically seen and treated by medical personnel, ranging from primary health care providers such as family physicians or emergency doctors to optometrists and ophthalmologists.[4] However, there are no standardized practices as to which practitioners initially treat patients with corneal abrasions. There is also wide variation in treatment and follow-up patterns.

This study is a multicentre retrospective review of all the patients who presented to the 2 hospitals comprising the McGill University Health Center in Montreal, Canada, for a 2-year period from July 1, 2014, to June 30, 2016. The aim of this study was to characterize the treatment and follow-up patterns at a major academic health system to help guide treatment and referral patterns in corneal abrasions.

At the McGill University Health Center hospitals, most patients presenting to the emergency department with corneal abrasions are referred to ophthalmology. They may be seen by any of 20 residents or a similar number of staff physicians, providing an opportunity to examine different practice patterns and better determine the utility for initial ophthalmologic consultation and/or further follow-up.

Methods

Approval was obtained from the McGill University Health Centre Research Ethics Board. All new ophthalmology consults entered into the electronic medical record system of the Montreal General Hospital and Royal Victoria Hospital between July 1, 2014, and June 30, 2016, were reviewed. All patient charts from this search were reviewed by a senior ophthalmology resident (postgraduate year 4) and a cornea, anterior segment, and uveitis specialist. All consultations primarily for corneal abrasion, as determined by the emergency department physician, were included in the study. Patients who had previously been operated for corneal transplant in the affected eye or had undergone glaucoma filtration surgery (a bleb) were excluded. In addition, patients referred for a foreign body or for status post–foreign body removal by an emergency doctor were not included in the study.

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Demographic data were collected from the electronic medical record. Information on treatment regimen, corneal findings by emergency and ophthalmology physicians, time between follow-ups, and final outcomes was collected. In addition, for patients who did see ophthalmology, the chart was reviewed and a determination was made as to whether the involvement of the ophthalmologist changed management for the patient, and if so, what that change was and why.

Results

A total of 1844 consults were made to ophthalmology from the 2 adult emergency departments of the McGill University Health Center (Montreal General and Royal Victoria Hospitals). Ninety-four patients were referred for corneal abrasion as assessed by the attending emergency physician. Four patients were excluded according to predetermined exclusion criteria (patients with a corneal transplant or glaucoma filtering surgery), leaving a total of 90 patients included in the study. This represented 4.9% of all consults to the ophthalmology department at both hospitals over the 2-year period in question, third in frequency behind posterior vitreous detachment symptoms and blunt orbital or facial traumas.

The median age of the patients was 38 years (range 18–83 years, standard deviation [SD] 17.4 years). Patients included 50 males and 40 females.

Of the total of 90 patients, 75 (83%) saw an ophthalmologist after being initially assessed by the emergency doctor. Fifteen patients were given consults and told to follow-up with ophthalmology but did not arrive for their appointments.

The 75 patients examined by ophthalmology were seen a median of 1 day after the emergency room (ER) visit (range 0–10 days, SD 1.9 days). Twenty-two of the abrasions were already healed by the time of the examination (median 2 days, SD 2.6 days, range 1–10 days). Fifty-one patients were diagnosed as having corneal abrasions with epithelial defects (median 0 days, SD 0.9 days, range 0–4 days). Overall, 2 patients were initially diagnosed incorrectly by the emergency physician: 1 had bacterial keratitis status post–fingernail trauma to the eye, and the other had a marginal sterile infiltrate.

Management was changed in 5 of the 22 (23%) healed abrasions: in 3, hypertonic saline ointment (Muro 128) was prescribed for prophylaxis against future recurrent erosion syndrome, and in 2 the antibiotic drops were stopped earlier than prescribed by the emergency physician (Table 1). Management was changed in 24 of the 51 active abrasions (47%), with 7 patients being given bandage contact lenses for comfort (typically for large abrasions), 10 patients given Muro 128 for prophylaxis against or treatment for recurrent erosion syndrome, 6 patients had their antibiotic regimen changed or stopped earlier, and 1 patient was followed and treated for a persistent epithelial defect.

Thirty-five out of the 75 patients had at least a second follow-up visit with ophthalmology (46%), ranging from 1 to 30 days after (median 3 days, SD 6.25 days). In all cases, the patients recovered completely. Only for patients with infiltrates (2) and persistent epithelial defect (1) and for patients who had a subsequent episode of recurrent erosion (2) was management changed on any appointment after the initial follow-up.

Treatment was started in a majority of cases (58/90 [64%]) by primary care physicians. The majority of patients were started on moxifloxacin alone (57) or moxifloxacin plus erythromycin (10). Three patients were started on an antibiotic plus topical diclofenac, all by emergency physicians, with the topical diclofenac being subsequently discontinued by ophthalmology at the first visit.

Discussion

Corneal abrasions are typically viewed as a minor if painful condition by ophthalmologists, but in a small proportion of cases they can have serious consequences.[2] The American Association of Family Physician has follow-up guidelines for its members, suggesting follow-up by the primary care physician 24 hours after the first visit and again in 3–4 days if still not healed. They also suggest referral to ophthalmologists be limited to situations with deep eye injuries, suspicion of recurrent erosion syndrome, suspicion of an infiltrate, a foreign body that cannot be removed, worsening symptoms or symptoms not improving daily, or nonresolution after 3 days.[2] The *Wills Eye Manual*, a common reference for ophthalmologists, suggests administering antibiotics, including antipseudomonal coverage for contact lens wearers; avoiding steroids with epithelial defects; debriding loose or hanging epithelium; and considering NSAIDs for pain control. Follow-up is suggested the next day for large or central abrasions and contact lens wearers or in 2–5 days for other cases.[5] Emergency physicians at certain institutions also have similar guidelines.[4] In an urban emergency department, however, arranging daily follow-up is not always practical.

Table 1—Management changes by ophthalmology

	Healed at First Ophthalmology Visit	Not Healed at First Ophthalmology Visit
Patients	22	51
Median days after primary care visit	2 (range 1–10)	0 (range 0–4)
Management changed by ophthalmology visit	5 (23%)	24 (47%)