Upper-Eyelid Wick Syndrome

Association of Upper-Eyelid Dermatochalasis and Tearing

Inbal Avisar, MD; Jonathan H. Norris, FRCOphth; Dinesh Selva, FRACS, FRANZCO; Raman Malhotra, FRCOphth

Objective: To highlight a case series of patients manifesting epiphora and misdirection of tears laterally or along the upper-eyelid skin crease. This association has been termed upper-eyelid wick syndrome. We describe the clinical features and outcomes of management of these patients.

Methods: A retrospective review of patients referred to 2 oculoplastic centers during a 6-year period for epiphora, who were considered to have misdirection of tears related in some way to upper-eyelid dermatochalasis.

Results: Nine patients (7 women and 2 men; mean [SD] age, 61.2 [11.3] years, range, 41-76 years) with bilateral epiphora and lateral spillover (100%), occasionally combined with upper-eyelid wetting (n=2). All patients had upper-eyelid dermatochalasis. Five patients had upper-eyelid skin obscuring and in contact with the lateral canthus (type 1), and in 4 the lateral canthus was only partially obscured by upper-eyelid skin (type 2). Five patients (56%) had linear excoriation of skin in the lateral canthus. All patients underwent upper-eyelid blepharoplasty, 3 combined with ptosis repair and 3 combined with eyebrow-lift. All patients achieved 80% to 100% improvement in epiphora following surgical intervention to the upper eyelid. The mean (range) follow-up was 2.8 (1-6) years.

Conclusions: We defined upper-eyelid wick syndrome as the misdirection of tears laterally or along the upper-eyelid skin crease causing epiphora, related in some way to upper-eyelid dermatochalasis. In all cases, epiphora improved with treatment of upper-eyelid dermatochalasis. Although recognized among physicians, this has never been formally described in the ophthalmic literature, to our knowledge.

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EPIPHORA IS OFTEN ETIOLOGICALLY multifactorial, ranging from hyperlacrimation (supranuclear, infranuclear, and reflex tearing due to evaporative dry eye) to pump failure to outflow dysfunction, including lower-eyelid malposition or stenosis at the level of the puncti, canaliculi, lacrimal sac, or nasolacrimal duct. Addressing a single factor in multifactorial epiphora may lead to only a moderate improvement in symptoms.1,2

Bothersome upper-eyelid dermatochalasis typically causes symptoms of gradual increasing heaviness of the upper eyelid, a tired or worn appearance, puffy or swollen eyes, and diminution of peripheral upper visual fields. Severe dermatochalasis may overhang the eyelid margin to exacerbate lash ptosis and cause ocular discomfort and corneal irritation. Female patients often report difficulty in applying eyeliner and mascara to the upper eyelids.3,4 Epiphora is not frequently addressed as a symptom related to dermatochalasis. However, patients with dermatochalasis often report symptoms such as burning, itching, and epiphora. Although the impact of upper-eyelid dermatochalasis has been recognized by physicians, the role of the upper eyelid as a causative factor in epiphora is not well described.

We describe a series of patients manifesting epiphora and misdirection of tears laterally or along the upper-eyelid skin crease. All patients had a degree of upper-eyelid dermatochalasis, some with skinfold contact to the lower-eyelid margin, and epiphora improved or resolved in all cases following interventional treatment to reduce upper-eyelid dermatochalasis. This association has been termed upper-eyelid wick syndrome. We highlight the clinical features and outcomes of management of patients with upper-eyelid wick syndrome.

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This was a retrospective case series of patients referred to 2 specialist oculoplastic centers from January 1, 2004, through December 31, 2010, for epiphora, considered to have misdirection related in some way to upper-eyelid dermatochalasis (“wicking of tears”), in whom interventional treatment to the upper eyelid improved epiphora. Institutional review board approval was obtained for this retrospective study. Clinical records were reviewed and patient demographic characteristics, preoperative frequency of wiping, site of tear spillover (lateral or medial aspect and/or upper-eyelid wetting), and associated dry-eye symptoms related to reflex tearing were recorded. Presence of lateral canthus skin excoriation, upper-eyelid dermatochalasis, ptosis, horizontal lower-eyelid laxity including lower eyelid lateral sag, patency to lacrimal syringing, and results of fluorescein dye retention testing (FDRT) were also recorded.

During assessment, the eyebrow was gently elevated with a thumb or finger placed over the eyebrow hair to reduce the degree of apparent dermatochalasis and lateral canthus skin contact. The FDRT was then repeated to demonstrate a reduction in misdirection and lateral spillover and show the potential benefit of upper-eyelid treatment for dermatochalasis as a cause of misdirection before recommending surgery.

For the purpose of categorization, upper-eyelid dermatochalasis was retrospectively graded on the basis of standard photographs as either type 1 (lateral canthus in direct contact) or type 2 (lateral canthus partially obscured and not in direct contact).

The main outcome measures were subjective improvement in symptoms (percentage of improvement), objective improvement in wetting of upper-eyelid skinfold and skin crease, improvement in lateral canthus excoriation, and cessation of misdirection of tears using the FDRT with no misdirection of the upper-eyelid skinfold and crease.

Patients were excluded if during this period their symptoms improved with conservative measures only (without any intervention to the upper eyelid), if they underwent additional surgery for epiphora to the lower eyelids or lacrimal system, or if preoperative symptoms of epiphora were reported only retrospectively following upper-eyelid surgery. Conservative measures included ocular lubricants and warm compresses for evaporative dry eye causing reflex tearing, for example. All patients were given conservative measures at the time of listing for upper-eyelid surgery to exclude this as a significant cause.

Our surgical technique of upper blepharoplasty and posterior-aponeurotic ptosis correction has been previously described.6 Our surgical technique of endoscopic eyebrow-lift is based on a standard technique for direct eyebrow-lift has been previously described.7 For the purpose of categorization, upper-eyelid dermatochalasis was retrospectively graded on the basis of standard photographs as either type 1 (lateral canthus in direct contact) or type 2 (lateral canthus partially obscured and not in direct contact).

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Nine patients (7 women and 2 men; mean [SD] age, 61.2 [11.3] years, range, 41-76 years) were identified. All

### METHODS

#### Case Series of Patients Manifesting Upper-Eyelid Wick Syndrome

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Abbreviations: bleph, upper-eyelid blepharoplasty; DBL, direct brow lift; EBL, endoscopic brow lift; FDRT, fluorescein dye retention testing; neg, negative; P, patent; pos, positive; ptosis, posterior approach ptosis repair.

**Type of dermatochalasis and relation to lateral canthus:** type 1 (lateral canthus obscured and in contact) or type 2 (lateral canthus partially obscured and not in direct contact).
had symptoms of epiphora with lateral spillover, occasionally combined with upper-eyelid spillover or wetting (2 patients [22%]). Clinical details of each patient are included in the Table. The mean (range) frequency of wiping the eyes was every 75 (5-180) minutes, especially when outdoors.

Four patients (44%) also reported epiphora occurring during tasks associated with reduced blink-rate, such as watching television, reading, using a computer, or driving, suggestive of a reflex tearing component.

All patients had upper-eyelid dermatochalasis (100%). Five patients (56%) had upper-eyelid skin obscuring and in contact with lateral canthus (type 1), and in 4 (44%) the lateral canthus was only partially obscured by upper-eyelid skin (type 2).

Four patients (44%) had coexisting aponeurotic ptosis. Three patients (33%) had associated mild lower-eyelid laxity. Tear clearance (fluorescein dye retention test) had positive results bilaterally in 5 patients. In all patients, fluorescein tracked laterally along the lateral canthus and often upward to involve the upper-eyelid skin crease (Figure 1F). Upper-eyelid wicking usually occurred laterally but occasionally occurred along the medial upper-eyelid skin crease as well. Five patients (56%) had linear excoriation of skin in the lateral canthus.

All were freely patent to syringing except 1, who was 90% patent with mild resistance only. One patient underwent further investigation with lacrimal scintillography to exclude outflow dysfunction, and this demonstrated pooling of dye at and over the lateral canthus but no delay in drainage to the sac and nasolacrimal duct (Figure 2C).

All patients underwent upper-eyelid blepharoplasty, 3 of them combined with aponeurotic ptosis correction and 3 combined with eyebrow-lift (2 women underwent endoscopic eyebrow-lift and 1 man underwent direct eyebrow-lift).

All patients noticed a subjective improvement in epiphora (percentage of improvement, 80% to 100%) following surgical intervention to reduce upper-eyelid hooding. Objective improvement in fluorescein spillover (laterally and along the upper-eyelid skinfold and crease in FDRT) was noted in all patients. Preoperative linear excoriation of skin in the lateral canthus has resolved in all cases. No complications occurred, and beyond the first 2 postoperative weeks, no patient developed an increase in dry-eye symptoms or was
found to have lagophthalmos. The mean (range) follow-up was 2.8 (1-6) years. We highlight 2 cases in particular.

CASE 1

A 63-year-old woman was referred with a 2-year history of bilateral epiphora and lateral spillover requiring her to wipe her eyes every 5 minutes, especially outdoors and with cold wind but occasionally during activities of reduced blink-rate. She had no history of contact lens wear or injury. She had upper-eyelid aponeurotic ptosis and significant upper-eyelid hooding due to dermatochalasis and eyebrow ptosis with skin contact to the lateral canthus (Figure 1C). No skin excoriation was present, tear clearance was normal (negative results on FDRT), and fluorescein tracked laterally along the lateral canthus (wicking). Tear film breakup time was reduced at 2 to 3 seconds bilaterally with no corneal staining, and she was freely patent to syringing.

One month following bilateral ptosis repair, upper blepharoplasty, and endoscopic eyebrow-lift, her epiphora had resolved completely, and she remains asymptomatic at 2½ years with minimal epiphora occasionally during extremely cold and windy conditions only (Figure 1D).

CASE 4

A 41-year-old woman was referred with a 2-year history of bilateral epiphora with tears spilling over her outer cheek and smudging her upper-eyelid makeup, requiring her to wipe her eyes every 30 minutes, especially in cold and windy weather. She denied any dry-eye or reflex tearing symptoms. She had upper-eyelid dermatochalasis with linear lateral canthus skin excoriation on the right eye more than the left (Figure 1E) but no direct skinfold contact with the lateral canthus. She immediately felt an improvement in her epiphora on manually elevating her eyebrows. Tracking of tears along her upper eyelid (Figure 2A) was noticed during the FDRT.

She had signs of meibomian gland dysfunction and mild evaporative dry eye with early tear breakup time of 3 seconds but no corneal staining and no eyelid laxity. She was completely patent to syringing with no resistance or reflux. Conservative treatment of evaporative dry eye with regular ocular lubricants, warm compresses, and even a trial of lower punctal plugs failed to improve her symptoms.

Lacrimal scintillography was then arranged to exclude nasolacrimal duct outflow dysfunction. It demonstrated rapid transit of tracer through the nasolacrimal duct and presac conjunctival pooling, particularly laterally, with possible misdirection and tracking of tracer along the upper eyelid (Figure 2C).

Upper-eyelid hooding with lateral canthus wicking and tear misdirection was considered the main cause, and an upper-eyelid skin-only blepharoplasty was performed. Her symptoms completely resolved within 2 weeks and she remains asymptomatic at 18 months’ follow-up (Figure 2B).

COMMENT

This case series highlights a cause of epiphora that we have termed upper-eyelid wick syndrome. We reviewed the published literature regarding the cause and management of epiphora and performed a PubMed literature search using the keyword epiphora with dermatochalasis, blepharoplasty, surgery, management, or cause. We found no reports of this term or of such a phenomenon. Although we cannot conclude that this has never been reported, we believe that it is not a widely recognized cause of epiphora. Our findings support the treatment of upper-eyelid dermatochalasis in patients with this phenomenon.

We define upper-eyelid wick syndrome as symptoms and signs of epiphora and upper-eyelid dermatochalasis with evidence of tear misdirection based on symptoms of lateral spillover with or without upper-eyelid wetting and objective signs of staining with misdirection of fluorescein on FDRT. The FDRT demonstrates misdirection of tears not only laterally but also along the upper-eyelid skinfold and even along the upper-eyelid skin crease (evident when the upper-eyelid skinfold or eyebrow is lifted). During assessment, the eyebrow is then gently elevated with a thumb or finger placed over the eyebrow hair to reduce the degree of apparent dermatochalasis and lateral canthus skin contact. The FDRT is then repeated to demonstrate a reduction in misdirection and lateral spillover to show the potential benefit of upper-eyelid treatment for dermatochalasis as a cause of wicking before recommending surgery.

We identified 9 patients manifesting epiphora with potentially multiple factors for epiphora but all of whom displayed signs of misdirection of tears at the lateral canthus as their main cause for epiphora. This was secondary to excess skin of the upper eyelid in contact, or partially in contact, with the lateral canthus, resulting in a track and allowing tears to escape laterally and in some cases superiorly. In this series, all patients with wicking had moderately severe chronic epiphora with frequent wiping of the tears (every 5-180 minutes when outdoors). All had lateral spillover of tears, and 2 patients also had superior spillover toward the eyelid crease. This occasionally resulted in skin excoriation and in pooling of dye at the lateral canthus during lacrimal scintillography (case 4).

In most cases, the site of epiphora—whether it is medial (nasolacrimal duct obstruction, reflex, punctal or canalicu- lar stenosis, or ectropion) or lateral (lower-eyelid laxity, lower-eyelid retraction, or upper-eyelid wick syndrome)—is an important clue to the cause and should be identified during the consultation. In the case of upper-eyelid wick syndrome, the lateral spillover is a clue particularly if combined with upper spillover of the tears. This can be noticed when lifting the eyebrow to reveal the crease (Figure 1F). We also note that manual lifting of the eyebrow in the physician’s office can remove the contact between the upper eyelid and the lower eyelid margin and briefly improve epiphora and spillover of fluorescein. This can serve as a predictor of surgical success.
Only 1 patient (case 4) had medial wicking that was demonstrable on FDRT and resolved following upper blepharoplasty only. We cannot reliably make any conclusions regarding the possibility of medial wicking beyond this observation.

We do not believe that the administration of conservative measures in the form of lubricants and warm compresses confounded the results of this study because patients underwent upper-eyelid surgery only after review following conservative treatment. Each patient acted as his or her own control. Furthermore, none of our patients had significant lateral retraction that would be an obvious cause of lateral spillover; and following upper-eyelid surgery, on reviewing photographs, none of the patients have any significant or even noticeable change in lateral canthus height or lower-eyelid contour. This suggests that the improvement in symptoms is not due primarily to an indirect change in the lower-eyelid position or laxity following upper-eyelid surgery.

Vold et al8 retrospectively reported subjective improvement in what they described as “dry-eye” symptoms following blepharoplasty. These symptoms included mattering, burning, itching, redness, epiphora, foreign-body sensation, and photophobia. Aqueous deficiency or evaporative dry eye was clearly demonstrated preoperatively, and a Schirmer test without anesthesia was used to assess dry eye.

Disadvantages of the Schirmer test without anesthesia include low reproducibility, sensitivity, and specificity, and perhaps most relevant is the lack of control over reflex lacrimation when the test is performed without anesthesia.9 A Schirmer test without anesthesia may be reasonably considered valid only with moderate repeatability for severe dry eye.10 It lacks sufficient sensitivity and is too variable to be used in the diagnosis or grading of milder dry eye. However, no definitive conclusions may be drawn about the ability of the Schirmer test with anesthesia to detect and grade mild dry eye and to distinguish categorically between aqueous deficiency and evaporative dry eye syndromes.11

More than 80% of patients in the series by Vold et al.,8 who sought care because of combined dermatochalasis and “dry eye” symptoms, had improved dry-eye symptoms following blepharoplasty. The authors proposed that sustained elevation of the eyebrows causes periorbital fatigue and interference with normal complete blinking. Although unable to demonstrate this, they proposed that this led to increased evaporation of the tear film resulting in relatively dry eye and observed thinning or disruption of the tear film.

Abell et al12 demonstrated that upper-eyelid blepharoplasty did not result in an altered blink mechanism 2 and 12 months postoperatively. Floegel et al13 also reported a subjective improvement in dry-eye symptoms but no significant improvement in the Schirmer test without anesthesia or in the fluorescein breakup time at 3 months in 5 of 11 patients who underwent upper-eyelid blepharoplasty. In 70% of cases, there was no surface change on impression cytology in the follow-up period. Floegel et al13 concluded that, except for the surface inflammatory reaction, these objective ocular parameters do not change significantly after blepharoplasty, whereas subjective ocular symptoms improve.

Upper-eyelid wick syndrome, frequently accompanied by eyelid lateral canthus contact, may indeed contribute to symptoms such as epiphora, itching, burning, and excoriation of skin in the lateral canthus in patients with dermatochalasis. In all our cases, we deliberately and specifically aimed to preoperatively evaluate symptoms of evaporative dry eye that may cause reflex tearing. Furthermore, we routinely treated patients preoperatively with a regimen to exclude evaporative dry eye and reflex tearing, including a trial of intensive lubricants. In addition, none of the patients developed postoperative dry eye beyond the immediate postoperative period or any signs of eyelid malposition or lagophthalmos. Therefore, it is unlikely that in our series blepharoplasty reduced epiphora simply by inducing dry eye.14-16

We suspect that in some cases, upper-eyelid wick syndrome occurs because of capillarity when upper-eyelid dermatochalasis lies in contact with the lateral canthus, forming a wick to misdirect tears either to spill over the lateral canthus or toward and along the upper-eyelid crease. This is particularly likely in type 1, where there is obvious contact. The cause of misdirection in type 2, where lateral canthus contact is less apparent, is less evident. There is no clear capillary action to explain wicking of tears in this group. Possible contributing factors are relative lateral lash ptosis or an altered upper-eyelid excursion during blink due to a descended upper-eyelid skinfold. It is unlikely that the upper-eyelid lashes are scooping tears across because this would give rise to symptoms and signs of wetting of, or splashing from, upper lashes. Upper-eyelid entropion, a feature that we deliberately examined, was also not apparent in any of this cohort. On the basis of the fact that not all patients with upper-eyelid wick syndrome have actual skin contact with the lateral canthus, it is clear that the severity of symptoms does not correlate with the severity of dermatochalasis. Furthermore, patients looking to have upper-eyelid blepharoplasty may overlap their symptoms of epiphora. The fact that our series is small reflects that this entity is underrecognized and that the diagnosis is often confirmed postoperatively. However, signs such as misdirection of fluorescein and improvement with manual elevation of the lateral eyebrow, and less constant features, such as lateral canthus excoriation, are more objective signs that may be relied upon.

In conclusion, we define upper-eyelid wick syndrome as the misdirection of tears laterally or along the upper-eyelid skin crease causing epiphora, related in some way to upper-eyelid dermatochalasis. Patients often report wetting of the upper-eyelid skin and smudging of makeup and may experience an improvement with manual elevation of the eyebrow. Objective signs include spillover of fluorescein from the lateral canthus, often tracking along the upper-eyelid skin crease, that may improve with eyebrow elevation. Lateral canthus linear skin excoriation may also be seen occasionally. Epiphora and excoriation improve with treatment of upper-eyelid dermatochalasis.
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REFERENCES