



Etiology and Management of Epiphora in the Adult Patient: A Retrospective Study in an Interdisciplinary Epiphora Clinic

Vincent Q^{1*}, Roxane F¹, Aurelie L¹ and Nicolas M²

¹Department of Ophthalmology, UCLouvain, UCLouvain Catholic University of Louvain, Belgium

²Department of Otorhinolaryngology, UCLouvain, UCLouvain Catholic University of Louvain, Belgium

Abstract

Background: Epiphora in adults is a frequent ophthalmological condition with multiple etiologies, and requires a multidisciplinary approach for management, diagnosis and treatment, combining ophthalmologists, ENTs, nuclear medicine specialists, radiologists. Few centers possess a truly multi-specialty method for analyzing and treating epiphora in adults.

Materials and Methods: We have conducted a retrospective study on 57 patients with a follow-up of 12 months, to examine the different etiologies and treatments in a multidisciplinary epiphora clinic in a tertiary care setting. Patients were systematically examined by an ophthalmologist and an ENT specialist, in addition to a full epiphora clinical workup. If needed, they were then referred for additional examinations in radiology (dacryo cone beam scanner) or scintigraphy.

Results: Obstruction at any stage of the lacrimal drainage system was the most common cause of epiphora (48%), followed by ocular surface disease (28%), then eyelid malposition or laxity (26%), and finally functional causes. Regarding treatments, 10.5% (n=6) of patients underwent 3-snip punctoplasty, 8% (n=5) underwent canalicular re-permeabilization through sharp catheterization, 21% (n=12) underwent DCR, 42% (n=24) were prescribed lid hygiene or ocular lubrication, 21% (n=12) underwent eyelid surgery through canthopexy, 1% (n=1) had a combined treatment and 19% (n=11) had no treatment.

Discussion: A multidisciplinary collaboration is crucial in epiphora management. In addition, our results are in line with the etiology distributions found in the literature.

Background and Introduction

Epiphora is an extremely common cause of complaint in adult ophthalmology and otorhinolaryngology, with patients describing abnormal tearing or excessive pooling of tears on the ocular surface, overflow of tears onto the face, leading to significant discomfort and eventually a decrease in the quality of life of affected patients [1]. Symptomatically, epiphora can cause a blurry vision, foreign body sensation, tear overflow from the eye running onto the cheek and beyond, discharge of mucus or pus, and eyelid skin excoriation from constant wiping [2]. Superinfected or fully obstructive cases can sometimes be accompanied with mucocoele, dacryocoele, dacryocystitis or conjunctivitis. Symptoms are usually noted by the patient to be occasional and not constant, with duration of epiphora ranging from a few minutes to a few hours of discomfort, and with a frequency of a few times per day to a few times per hour. Epiphora has the tendency to appear more frequently when the patient goes outdoors, and increased with wind intensity on the face and with lower temperatures. Positional interferences have been noted as well with patients reporting more complaints in a procubitus position. Numerous studies in the literature have examined specific etiologies of epiphora i.e. nasolacrimal duct obstruction or eyelid laxity [3-8], with their corresponding treatment outcomes, but few have been executed in an interdisciplinary methodology across departments, and few have been concentrating on examining the profile and distribution of the whole range of etiologies across the whole spectrum of possibilities.

In this article, we have approached the epiphora patient in a newly-designed Epiphora Clinic specially tailored for the interdisciplinary nature of the condition. More specifically, a real collaboration between ophthalmologists, otorhinolaryngologists (Ear-Nose-Throat, ENTs), radiologists and nuclear medicine specialists takes place. The first objective of this article is to first

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*Correspondence:

Vincent Qin, Department of Ophthalmology, UCLouvain, UCLouvain Catholic University of Louvain, Site Sainte Elisabeth, B-5000 Namur, Belgium,

E-mail: vincent.qin@live.be

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analyze the spectrum and distribution of etiologies in adult epiphora patients, in this specific transdisciplinary approach, and not solely based on the ophthalmological approach; the second objective of this article is to analyze the treatment profiles received by the patients across the whole distribution of etiologies.

This article will purposefully not examine the etiologies and management of epiphora in children, but will concentrate solely on the case of adults, whose etiology profiles are different from that of children. Furthermore, this paper does not intend to show the efficacy of specific treatments (i.e. DCRs, etc) but rather purports to provide a cross-sectional view of the etiologies and treatments offered in an interdisciplinary epiphora management center.

Materials and Methods

We conducted a retrospective study from August 2018 to August 2019 on 57 epiphora patients in our Epiphora Clinic in Namur, Belgium. This study was approved by the ethical committee of our institution and all patients signed an informed consent. The epiphora clinic is a unique and novel structure in Belgium specialized in the diagnosis, management and treatment of epiphora patients, based on a unique well-defined cross-departmental collaboration between ophthalmologists, ENTs, radiologists, maxillofacial surgeons and nuclear medicine specialists, all of whom have specific expertise in epiphora. All patients were aged between 40 and 93 years old. Every single epiphora patient included in the study was systematically examined by at least an ophthalmologist and an otorhinolaryngologist. Medical Anamnesis was recorded with a questionnaire along with an epiphora score rated from 1 (minimum discomfort) to 10 (extreme discomfort), followed by a full ophthalmological examination (including eyelid examination of laxity or other eyelid disorders, ocular surface examination with slit lamp examination with corneal fluorescein staining, examination of the lacrimal punctum), a full rhinological examination (with a nasal speculum and nasal endoscopy), irrigation and probing of the lacrimal drainage system. If judged necessary, patients with suspected disorders of the lacrimal drainage system then underwent a lacrimal scintigraphy (dacryoscintigraphy) with Tc 99m instilled on the ocular surface, and a CT dacryography with selective lacrimal duct catheterization (Dacryo Cone Beam scanning).

Patients were then categorized three main etiology groups: Obstructive, functional, eyelid malposition. One patient can present several different etiologies, and as such mixed etiologies can be possible. Obstructive etiologies were further classified into proximal, higher obstructions (lacrimal punctum, superior or inferior canaliculus, common canaliculus) or distal, lower obstructions (nasolacrimal duct obstruction, partial or total); while functional etiologies were further classified into ocular surface disorders or lacrimal pump disorders. Worthy of note is that patients could present two or more causes to their epiphora; for instance obstructive causes could be combined with palpebral malposition causes. This explains that the category distributions and relative frequencies do not add up to 100%, rather they add to more than 100%. Percentages should thus be interpreted as: the proportion of epiphora patients who had at amongst others the observed etiology.

Furthermore, once the diagnosis of the cause of epiphora was determined during a multidisciplinary discussion, the patients were informed and received the appropriate treatment, out of one of the following categories: 3-snip punctoplasty, proximal canaliculus

Table 1: Age of the studied sample population.

	Age
Average	66.32355
Standard Deviation	12.00795

Table 2: Sex of the studied sample population.

Sex	
Male	17
Female	40
Sex Ratio (M/F)	0.425

Table 3: Initial, pre-treatment epiphora complaint score.

	Initial Epiphora Score
Mean	7.10
Standard Deviation	1.56

repermeabilization, dacryocystorhinostomy (endoscopic), treatment of the ocular surface (lid hygiene and lubrication), and eyelid surgery (canthopexy). Combined treatments were possible, and no treatment was applied in several patients.

Here, again, it is possible that multiple treatments could be offered to the same patient, resulting in relative frequencies summing to more than 100% finally, post-treatment epiphora was assessed with again an epiphora score 1 (minimum discomfort) to 10 (extreme discomfort).

Results

Basic epidemiological data is shown in Table 1 and demonstrates that the mean age of the epiphora patients was 67.14 years (SD 12.00), with Table 2 showing the sex distribution: 17 men and 40 women (Sex-Ratio M/F 0.425). Mean follow-up time was two years. Average epiphora score at initial workup was 7.10 on a scale of 1 (little discomfort) to 10 (extreme discomfort), with a standard deviation of 1.56 (Table 3).

Include proportions patients who have had a specific additional examination?

The etiologies distributions are shown in Table 4. Obstructive etiologies were the largest cause in epiphora patients: 42% (n=24) of epiphora patients had shown obstruction at some stage of their lacrimal drainage system. When we consider these obstructive causes, punctal stenosis concerned 10% (n=6) of all epiphora patients, canalicular obstructions concerned 8.7% (n=5) of all epiphora patients, and lower obstructions 22.8% (n=13) of all epiphora patients.

Second in ranking were functional etiologies of epiphora: mainly ocular surface disease (i.e. Ocular surface irritation, corneal disease, punctate keratitis, conjunctival abnormalities, blepharitis), which accounted for 28% (n=16) of all epiphora cases. Finally, eyelid malposition were the third main culprit regarding epiphora, with 26% (n=15) of cases due to lower eyelid laxity.

If we consider the therapeutic options that were offered, the cross-sectional analysis is listed on Table 5: 10.5% (n=6) of patients underwent 3-snip punctoplasty, 8% (n=5) underwent canalicular repermeabilization through sharp catheterization, 21% (n=12) underwent DCR, 42% (n=24) were prescribed lid hygiene or ocular lubrication, 21% (n=12) underwent eyelid surgery through

Table 4: Etiology distribution per causal category.

Obstructive					Functional			Malposition palpebrale	Mixed	Non Categorized
Higher			Lower		Ocular Surface Disease	Pure Dry Eye	Lacrimal Pump Deficiency	Ectropion or Lower Eyelid Laxity		
Punctum	Canalicular (superior or inferior)	Common Canaliculus	Partial	Total						
6	2	3	9	4	15	1	0	15	0	2
Total higher obstructive		11			Total Functional	16				
Total lower obstructive		13								

Table 5: Treatment distribution.

3-snip punctoplasty	Canalicular re-permeabilization through sharp catheterization	Tube de Jones	DCR	Eyelid Hygiene and Ocular Surface Lubrication	Eyelid Surgery (Canthopexy)	Combined??	No treatment
6	5	0	12	24	12	1	11
0.105	0.0875	0	0.21	0.42	0.21	0.0175	0.1925

Table 6: Final, post-treatment epiphora complaint score at one year.

	Final (post treatment) Epiphora Score
Mean	4.14
Standard Deviation	2.54

canthopexy, 1% (n=1) had a combined treatment and 19% (n=11) had no treatment.

Post treatment Epiphora Scores scored notably lower than at initial presentation, with an average of 4.14 on the 1 to 10 scale with a standard deviation of 2.54 at one year (Table 6).

If we plot the epiphora scores pre and post treatment, there is a significant decrease in the quantified epiphora complaints of the patients.

Discussion

In this retrospective study, the main aim was to have a cross sectional view of the etiologies and the therapeutic options of first-line epiphora patients, with no a priori classification. Unsurprisingly, the three main causes of epiphora in our study are lower (lacrimonasal duct) obstructions, eyelid malpositions and ocular surface disease. Punctal stenosis account for a little bit less of the cases. Combined/mixed cases were not uncommon, and multiple/combined treatments were frequently used and exploited. Interestingly, almost half (42%) of all epiphora patients were at some point started on ocular surface treatment/lubrication/lid hygiene, as this treatment is frequently started by ophthalmologists and otorhinolaryngologists alike as a first measure. Lacrimal pump dysfunctions is considered as a diagnosis of exclusion and as such are seldom encountered, all other causes must be excluded before a patient be labeled as having lacrimal pump dysfunction.

Comparing our results with the literature, we note that they are superposable and coherent with regard to the etiology distribution. Sibley et al. [9], all note that the main cause of epiphora is stenosis at some point of the lacrimonasal drainage system (31.8%), followed by ocular surface disease, irritation and reflex tearing (29.2%), and followed by eyelid laxity (10.4%), which is very comparable to our results. Brett et al. [10], and Rozycki et al. [11], also note similar findings with regards to the etiology of epiphora.

This study also eminently shows the importance of a multidisciplinary approach for epiphora patients. Too often, is the multidisciplinary nature of epiphora complaints overlooked and the

patient is too frequently assigned for a DCR, whereas in reality, a full workup should be made, bringing together the ophthalmologist, the otorhinolaryngologist, the radiologist, the maxillofacial surgeon and the nuclear medicine physician. Imagery and scintigraphy should be made if there are clinical arguments for a stasis or a stenosis of the lacrimal drainage system, particularly for relative/partial lower stenosis (of the lacrimonasal duct). We specifically hypothesize that a full interdisciplinary workup of epiphora forms a strong basis in order to increase treatment efficiency and improve the indication-decision-making process. It is possible that, in some instances, too many DCR indications are wrongfully posed, which could lead to lower success rates in DCRs. In addition, the interdisciplinary approach also allows for the assessment of mixed /combined cases, requiring a combined therapy (i.e. punctal stenosis associated with eyelid laxity, requiring punctoplasty with canthopexy, or lower lacrimonasal duct obstructions associated with ocular surface disease requiring DCRs with ocular surface treatments).

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