

## The New Definition of Epiphora Should be Rejected

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### Abstract

The term “epiphora” has been used since ancient Greece to describe the overflow of tears onto the face. This symptom can result from excessive tear production or inadequate tear drainage. However, in the 1960s, the term “epiphora” was redefined as a disorder solely due to inadequate tear drainage. Adoption of the new definition of epiphora has been inconsistent. The new definition is not consistent with expressions such as “reflex epiphora” and “gustatory epiphora” which still appear in the literature. We propose that epiphora should describe the symptom of tear overflow for any reason, as it did for thousands of years. Modifiers, such as obstructive epiphora or hypersecretory epiphora, could clarify the cause of the symptom.

### Introduction

The overflow of tears onto the cheek is a common ophthalmic symptom, which classically was termed *epiphora*. This symptom was described in ancient Egypt (1500 B.C.) and during the era of Hippocrates (460 BC – 370 BC) (Hirschberg 1982, vol 1., p.10).<sup>1</sup>

### Epiphora

The term “epiphora” originates from the Greek word “epifora,” which is derived from *phérein* (to bring) and *epi* (upon).<sup>2</sup> Thus, the term epiphora means “to bring upon,” referring to an overflow of tears.<sup>3,4,5</sup>

The physician Galen of Pergamon (129 A.D. – 200 A.D.) noted:

“A canal goes from the eyes to the palate and empties there the secretion formed in the eye. Watering may have three causes; either this canal is blocked, or the secretion is excessive or a scar at the nasal canthus. The

latter most is incurable” (Hirschberg, 1984, Vol 3, p.250).<sup>4</sup>

Galen also wrote:

“at the canthus major [*medial angle*] is a flesh-like body [*soma sarkodes, caruncula*]. It is there to protect the two orifices from which secretion runs from the eyes into the nose [*lacrima pathways*]. It prevents overflowing of the tears at the canthus and directs the tears into the appropriate openings. If the flesh-like body is destroyed epiphora will result”... “these openings lead into the nose and either produce or drain fluid, as the necessity arises.”<sup>5</sup>

In other words, Galen described epiphora as an overabundance of tear fluid emanating from the eyes as a result of either hypersecretion from tear glands or blockage of the tear ducts.

In antiquity, lacrimal obstruction from dacryocystitis, which often progressed to a lacrimal fistula, was treated surgically. Roman encyclopedist Cornelius Celsus (25 B.C. – 50 A.D) described the procedure (De Medicina 7.7): “...the margin of the opening is to be caught up by a hook...the whole channel down to the bone is to be excised...the bone is to be cauterized”.(Celsus 1938, p. 336).<sup>6</sup> Galen also described this surgery.<sup>7</sup>

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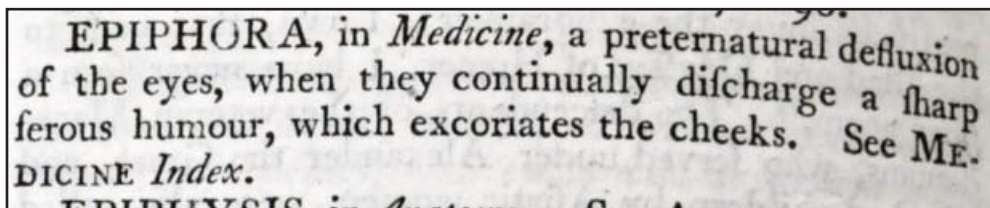
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Found in the dictionary of Sir Thomas Eliot knight in 1538, epiphora was defined as a “syckenes of the eyes, called the droppynge of the eies.”<sup>8</sup> An alternative dictionary published in 1598 by Arnold Hatfield further clarifies this definition as: “the watering or dropping of the eyes by means of a rheume issuing thereat.”<sup>9</sup> The Early English Books Online database, which includes over 40,000 English-language texts during 1475-1700, corroborates this definition in 49 separate records. During this period, the etiology of the watering was not part of the definition.

tery eye). Presumably some sort of symptom would require the patient to seek medical attention, but Jones was not specific about this question.

Jones also noted the alternative condition, in which the dye disappearance test demonstrated adequate drainage: “Lacrimal Hypersecretion (Lacrimation).—It is first necessary to differentiate between true hypersecretion and epiphora”. Once again, he was not specific about whether tear overflow or other signs or symptoms would be re-



Explanation in *Encyclopaedia Britannica*, 4th edition, 1810, vol.viii

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Presently, the Oxford English Dictionary defines epiphora as “a sudden efflux of humors; esp. ‘a superabundant flow of tears, or an aqueous or serous humor from the eyes.’”<sup>2</sup> Lacrimation is defined as “the excretion or shedding of tears; weeping.”<sup>10</sup> Tearing is defined as “to shed tears; to weep.”<sup>11</sup> The similarities between these three definitions are evident, but some subtleties can be explored.

Upon review, it is apparent that the word “epiphora” in historical literature, up to the 1960s (and even in today’s Oxford English Dictionary), has been consistent with Galen’s description. Epiphora was not restricted to either lacrimal gland hypersecretion or to inadequate lacrimal drainage—the etiology of the symptom has classically been irrelevant. However in 1961, Lester Jones redefined the term *epiphora* to be restricted to those cases in which dye does not drain normally into the nose: “In epiphora the excretory system is at fault.” Jones noted that epiphora could occur due to “canalicular dysfunction” or “acquired obstruction of the nasolacrimal duct.”<sup>12</sup>

He was not specific about whether epiphora required tear overflow onto the cheeks, or other signs (e.g. elevated tear film meniscus) or symptoms (a sensation of a wa-

quired to demonstrate lacrimal hypersecretion. This condition can result from ocular surface disease, allergy, physical irritants, hypothyroidism, or other endocrine disorders.

Jones’ nomenclature does not seem to distinguish tear overflow from a mere sensation of watery eyes. Moreover, his nomenclature does not seem to handle mixed etiologies. For instance, allergies can in principle result in both excessive tear production, and poor tear drainage due to nasal congestion. We might propose that tear overflow in this situation could be called “mixed epiphora”.

Since Jones’ 1961 report, the literature has used the term “epiphora” inconsistently. Some texts use the new nomenclature<sup>13,14,15,16,17</sup> while others continue to use the classic definition.<sup>18,19,20</sup>

The terms gustatory epiphora and reflex epiphora continue to be used in the literature. Gustatory epiphora, or “crocodile tears”, describes excessive lacrimation as a result of eating or smelling food.<sup>21</sup> This condition is theorized to be due to the aberrant regeneration of salivary nerve fibers to the lacrimal gland, usually following a seventh nerve palsy.<sup>22</sup> Reflex epiphora is the reactive production of tears due to any ocular surface

damage (i.e. exposure keratitis) or infectious ocular disease.<sup>23</sup> Clearly, tear overflow in gustatory and reflex epiphora is due to excess tear production, and therefore, these expressions are consistent with the classic (but not the revised) definition of epiphora.

In 1996, the American Academy of Ophthalmology (AAO) Basic and Clinical Science Course still taught the classic definition of epiphora: “Tearing is a subjective symptom. The presence of an overflow of tears confirms the sign of epiphora. The etiology of epiphora can be related to (1) ocular surface irritation with secondary hypersecretion, (2) outflow obstruction, or (3) primary idiopathic hypersecretion (rare).”<sup>24</sup> In trying to identify the cause of epiphora, the AAO suggested that an ophthalmologist should question if

nize that epiphora is an umbrella term that can constitute any etiology whereby there is an imbalance of tear production and tear drainage<sup>13</sup> [Table 1]. As such, we propose that epiphora continue to describe overflow tearing for any reason, as it has for thousands of years, and as it continues to be defined in the Oxford English Dictionary. When such tear overflow is caused by inadequate drainage, the term “obstructive epiphora” applies. Tear overflow due to excessive tear production should be termed “hypersecretory epiphora”.

Some patients have symptoms related to tearing, even though the tears do not flow down the cheek. The term *plerolacrima* was coined by Francis and colleagues in 2002 to describe “symptomatic watery eyes, but

#### **Tear Overproduction**

##### **Dacryoadenitis**

*Lacrimal nerve compression (i.e. via tumor)*

**Gustatory epiphora (crocodile tears)**

*Medications (i.e. cholinergic agonists)*

**Reflex epiphora caused by ocular surface disorders (chronic blepharitis, keratoconjunctivitis sicca, trichiasis, allergic conjunctivitis, exposure keratopathy, medicamentosa, foreign body, etc.).**

*Neuralgia*

**Psychogenic (i.e. emotional)**

*Others (i.e. bright lights, sneezing, etc)*

#### **Inadequate Tear Drainage**

##### **Dacrocystitis**

*Obstruction by neoplasm*

**Eyelid malposition: ectropion/entropion**

*Punctal eversion*

**Punctal/canalicular stenosis via medications (i.e. phospholine iodide, pilocarpine, epinephrine, idoxuridine), trauma, prior radiation therapy, congenital disorder, chronic inflammatory states, autoimmune disorders.**

*Punctal/canalicular/Nasolacrimal duct obstruction*

**Nasal (hay fever, rhinosinusitis, tumors)**

*Eyelid laxity or lagophthalmus*

the epiphora is due to outflow obstruction or due to increased lacrimal secretion.

However, in 2016, the teaching of the AAO Basic and Clinical Science Course is now consistent with the revised definition of epiphora: “Patients with acquired tearing can be loosely divided into 2 groups: those with hypersecretion of tears (lacrimation) and those with impairment of drainage (epiphora).” However, it is not clear that the course is internally consistent, because the text later offers the classic definition: “Epiphora is defined as overflow tearing.”<sup>25</sup>

As mentioned previously, adoption of the new definition of epiphora has been inconsistent. Many authors continue to recog-

nize that epiphora is an umbrella term that can constitute any etiology whereby there is an imbalance of tear production and tear drainage<sup>13</sup> [Table 1]. As such, we propose that epiphora continue to describe overflow tearing for any reason, as it has for thousands of years, and as it continues to be defined in the Oxford English Dictionary. When such tear overflow is caused by inadequate drainage, the term “obstructive epiphora” applies. Tear overflow due to excessive tear production should be termed “hypersecretory epiphora”.

*Plerolacrima* has not yet been listed in the Oxford English Dictionary. We have no particular objection to this term, though at present it is unfamiliar to most readers. Patients who present with symptomatic tearing without overflow can also simply be described as having “watery eyes without epiphora”. The categories of etiology can still be grouped as “obstructive tearing” and “hypersecretory tearing”.

## Conclusion

The purpose of language is clear communication. For thousands of years, epiphora has described the overflow of tears down the cheeks. Although some authors have tried to change the definition of epiphora in the last few decades, these attempts have been only incompletely adopted, and the literature has been unclear as a result. Modifiers, such as obstructive epiphora or hypersecretory epiphora, can be used to clarify the cause.

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