

IDIOPATHIC ACQUIRED LACRIMAL DRAINAGE OBSTRUCTION*†

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THERE are two basic types of idiopathic acquired obstruction of the lacrimal drainage system.

Canaliculus Obstruction.—This usually occurs close to the point of entry of the canaliculus into the lacrimal sac, either in the lower canaliculus itself or in the common canaliculus.

Naso-lacrimal Duct Obstruction.—This usually occurs at the upper end of the duct where it becomes continuous with the lacrimal sac.

At times, these two types of obstruction occur on the same side and this will be referred to as a *combined obstruction*. In view of differences relating to treatment, and possible differences relating to aetiology (*vide infra*), combined obstruction will be considered as a separate entity.

The information presented by Dalgleish (1964) was derived from the investigation of 3,487 persons who were regarded as representing a near-random sample of the adult population of this region. It was shown that the overall incidence (per cent.) of lacrimal obstruction on one or both sides is more or less equal in the two sexes and directly proportional to age, and that 35–40 years is the earliest expected age at onset of an obstruction of this type (Figure).

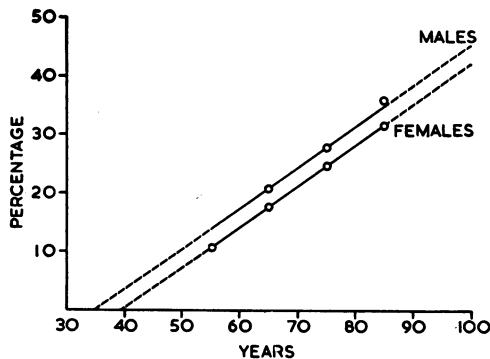


FIG. 1.—Percentage incidence of obstruction by age and sex.

By relating these data to the 1961 census of England and Wales, one estimates that the mean absolute incidence of lacrimal drainage obstruction in persons over the age of 40 years is about 14.5 per cent. in males and 14 per cent. in females.

Information concerning the pattern of these obstructions has been derived from a personal diagnostic investigation of a pool sample of 380 cases.

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Material and Method

The sample consisted of 109 males and 271 females and their average age was 55 years. These cases derived from three main sources in approximately equal numbers:

- (a) Patients attending with symptoms which could be directly associated with obstruction in the lacrimal drainage system.
- (b) Patients admitting to these symptoms on direct questioning.
- (c) Patients in whom lacrimal obstruction was detected as part of a routine examination; these were mainly "cold" surgical cases.

The criterion for the diagnosis of lacrimal obstruction was that saline could not be syringed through to the nose when the lower canaliculus was entered with a lacrimal cannula. If an obstruction was detected in the canaliculus, it was probed with the cannula and further syringing was then carried out to determine the presence or absence of further obstructions. In only one case was it not possible to enter the lower punctum with a lacrimal cannula; in this instance the remainder of the lacrimal drainage system was shown to be patent by syringing *via* the upper canaliculus.

Patients with an obvious external cause for lacrimal obstruction (*i.e.* post-traumatic and post-radiation obstructions) were excluded from the series. Two cases of actinomycotic canaliculitis were also excluded.

For the purpose of this investigation, dacryocystitis was defined as an episode of pain or tenderness related to the region adjacent to the medial canthus.

Results

The overall findings relating to the relative incidence of the various types of lacrimal obstruction in the sample, are shown in Table I, opposite.

Table II is a simplified presentation of the relative incidence of the three types of lacrimal drainage obstruction. The total percentage exceeds one hundred in both sexes, because there is a 4 per cent. and 6 per cent. relative incidence of *mixed lacrimal drainage obstruction* (different type of obstruction on the two sides) in males and females respectively, and these persons are therefore each included under two headings in Table II.

TABLE II
INCIDENCE OF OBSTRUCTION

Type of Obstruction (one or both sides affected)	Relative Incidence per cent.	
	Males	Females
Naso-Lacrimal	61	70
Canaliculus	36	22
Combined	7	14
Total	104	106

By relating the relative incidence per cent. of the three types of obstruction to the known overall *absolute* incidence of these conditions (14.5 per cent. in males and 14 per cent. in females, over the age of 40 years), the absolute incidence of any combination of these obstructions in either sex can be deduced. For example, Table I shows that the relative incidence of bilateral naso-lacrimal duct obstruction is 14 per cent. in males and 20 per cent. in females: the absolute incidence of the condition (over the age of 40 years) is therefore 14 per cent. of 14.5 per cent. = 2 per cent. in males, and 20 per cent. of 14 per cent. = 2.8 per cent. in females.

In this way Table II may be converted to present the absolute incidence of the three types of lacrimal obstruction as in Table III, opposite.

TABLE I
RELATIVE INCIDENCE (PER CENT.) OF VARIOUS COMBINATIONS OF THREE TYPES OF
LACRIMAL DRAINAGE OBSTRUCTION IN MALES AND FEMALES

Type of Obstruction		Right Side							
		Nil		Naso-Lacrimal		Canaliculus		Combined	
		Male	Female	Male	Female	Male	Female	Male	Female
Left Side	Nil	—	—	25	22	16	8	4	5
	Naso-Lacrimal	18	23	14	20	2	1	1	1
	Canaliculus	5	4	1	3	12	5	—	‡
	Combined	2	6	—	‡	—	‡	—	1

Note: In all cases (109 males and 271 females), both lacrimal drainage systems were investigated for obstructions. The upper horizontal column of the table indicates the findings relating to the *Right* sides and the left-hand vertical column indicates the findings relating to the *Left* sides. The relative incidence of the various combinations of the three types of lacrimal drainage obstruction are shown as a percentage in males and females respectively. *Combined obstruction* is a combination of naso-lacrimal and canaliculus obstructions on the *same* side.

TABLE III
INCIDENCE IN MALES AND FEMALES OVER
40 YEARS OF AGE

Type of Obstruction (one or both sides affected)	Absolute Incidence per cent.	
	Males	Females
Naso-Lacrimal	8.9	9.7
Canaliculus	5.3	3.0
Combined	1.0	1.9

TABLE IV
INCIDENCE OF NASO-LACRIMAL OBSTRUCTION

Type of Naso-Lacrimal Duct Obstruction	Relative Incidence per cent.	
	Males	Females
Unilateral	71	64
Bilateral	23	29
Naso-Lacrimal one side, some other type on opposite side	6	7

Naso-Lacrimal Duct Obstruction

The pattern of this type is shown in Table IV.

There is no significant difference in pattern in the two sexes. 7 per cent. of males and 20 per cent. of females gave a history of one or more episodes of dacryocystitis on the affected side. This observed difference in the incidence of dacryocystitis in the two sexes is significant ($P < 0.05 > 0.02$).

Canaliculus Obstruction

The pattern of this type is shown in Table V.

Once again, there is no significant difference in pattern between the two sexes. However, in subsequent discussion, a possible explanation will be offered for the higher incidence in females of canaliculus obstruction on one side associated with one of the other types of obstruction on the opposite side.

Dacryocystitis (as defined) does not appear to be associated with simple canaliculus obstruction.

TABLE V
INCIDENCE OF CANALICULUS OBSTRUCTION

Type of Canaliculus Obstruction	Relative Incidence per cent.	
	Males	Females
Unilateral	59	55
Bilateral	33	22.5
Canaliculus on one side, some other type on opposite side	8	22.5

Combined Obstruction

The number of cases in this category (8 males and 37 females) is too small to determine the pattern of the condition; 40 per cent. of males and 54 per cent. of females gave a history of one or more episodes of dacryocystitis on the affected side. The possible significance of this relatively high incidence of dacryocystitis will be considered.

Discussion

The main purpose of this paper is to contribute information about the pattern and incidence of idiopathic acquired obstructions of the lacrimal drainage system. The limitations of this study, which relate mainly to the sampling methods, are well appreciated: the scarcity of typed populations, the somewhat unpleasant nature of the examination, and the unknown aetiology of the conditions, are the main obstacles in this field of investigation. The solution of these problems is not in sight, and in the interim, Tables I to V present our most comprehensive available information on this subject.

It has been shown that 7 per cent. of males and 20 per cent. of females with naso-lacrimal duct obstruction give a history of one or more episodes of dacryocystitis on the affected side(s), and that this observed difference in the incidence of dacryocystitis in the two sexes is statistically significant ($P < 0.05$). Similarly, a history of dacryocystitis in patients with combined obstruction was given by 40 per cent. of males and 54 per cent. of females. This observed difference in the incidence of a history of dacryocystitis in combined as compared with naso-lacrimal duct obstruction cases is highly significant ($P < 0.001$). It has also been shown that dacryocystitis (as defined) does not appear to be associated with simple canaliculus obstruction. In my experience, non-specific dacryocystitis of a severity sufficient to produce symptoms, which is not associated with naso-lacrimal duct obstruction, is extremely uncommon.

These findings seem to indicate that the canaliculus obstruction in cases of combined obstruction is usually secondary to dacryocystitis, and that dacryocystitis (as defined) is usually secondary to naso-lacrimal duct obstruction. The sustained

clinical observation of many cases and the work of Jones (1960) tend to support these concepts. The association with dacryocystitis affords adequate explanation for the higher incidence (per cent.) of combined obstruction in females as compared with males (Tables II and III).

If it is accepted that the canaliculus obstruction in cases of combined obstruction is usually secondary to infection, then it is reasonable to assume that this mechanism for the production of a canaliculus obstruction may at times operate without an associated naso-lacrimal duct obstruction. In a previous communication (Dalglish, 1963), attention was drawn to the higher incidence of overt nasal, lacrimal, and conjunctival infection in cases of *bilateral* lacrimal drainage obstruction, as compared with unilateral cases. We have also noted the relatively high incidence of dacryocystitis in females. These factors may explain the higher incidence in females of canaliculus obstruction on one side associated with some other lacrimal drainage obstruction on the opposite side (Table V); *i.e.* some of these canaliculus obstructions may be "inflammatory" in type. Apart from the canaliculus obstruction of combined obstruction cases, it is likely that these non-specific inflammatory canaliculus obstructions account only for a small percentage of the canaliculus obstructions included in this survey. The vast majority of these cases must still be termed "simple" or "idiopathic" in type.

Table I indicates that slightly less than one-third of all patients with lacrimal drainage obstruction have *bilateral* obstructions (30 per cent. in males and 32 per cent. in females). In 87 per cent. of these cases in males, and 82 per cent. in females, the obstructions are bilaterally similar in type. In statistical terms, this high incidence of bilateral similarity is very significant ($P < 0.001$). Bilateral naso-lacrimal duct obstructions and bilateral canaliculus obstructions account for 81 per cent. of all bilateral obstructions.

In clinical terms, these findings seem to indicate different aetiological factors for the two main types of idiopathic acquired lacrimal obstruction: *i.e.* an individual may have a "naso-lacrimal duct obstruction diathesis", with a strong tendency to develop the condition bilaterally, or a "simple canaliculus obstruction diathesis", with a similar strong tendency to develop that condition bilaterally.

Summary

Information concerning the pattern and incidence of idiopathic acquired lacrimal drainage obstruction has been derived from a diagnostic investigation of a pool sample of 380 cases, and is related to data previously published (Dalglish, 1964) concerning the overall incidence of all types of idiopathic acquired lacrimal drainage obstruction.

Females with naso-lacrimal duct obstruction had a significantly higher incidence of a history of dacryocystitis than males ($P < 0.05$). There is a very significantly higher incidence of a history of dacryocystitis in cases of combined obstruction (a combination of canaliculus and naso-lacrimal obstructions on the *same* side) than in cases of naso-lacrimal duct obstruction ($P < 0.001$).

It is suggested that the canaliculus obstruction in cases of combined obstruction is usually secondary to dacryocystitis, and that dacryocystitis (as defined for the purpose of this investigation) is usually secondary to naso-lacrimal duct obstruction.

The aetiology of the vast majority of cases of canaliculus obstruction is obscure and these cases must still be termed "simple" or "idiopathic" in type. Apart from the canaliculus obstruction of combined obstruction cases, a few canaliculus obstructions are probably the result of non-specific inflammation.

Attention is drawn to the very significantly high incidence of bilateral similarity in cases of bilateral lacrimal drainage obstruction ($P < 0.001$), which suggests different aetiological factors are responsible for the two main types of idiopathic acquired lacrimal drainage obstruction.

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