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Inaccuracy of diagnosis in a cohort of patients on the waiting list for dacryocystorhinostomy when the diagnosis was made by only syringing the lacrimal system

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PURPOSE. *Accurate identification of the factors contributing to epiphora is essential in directing appropriate management and treatment strategies. The authors applied a methodical strategy of assessment for epiphora to patients who were already on the waiting list for dacryocystorhinostomy (DCR). The findings were compared to the original findings.*

METHODS. *Forty-four eyes of 35 patients listed for DCR were re-examined. All canaliculi were examined using four tests: dye disappearance, Jones 1 (dye retrieval), probing using Bowman probes, and syringing of the nasolacrimal duct (NLD) under local anesthesia. Some patients were examined using an endocanalicular mini-endoscope. Patients with NLD obstruction underwent DCR and those with canalicular and NLD stenosis underwent intubation of the lacrimal system-canaliculus, lacrimal sac, and nasolacrimal duct–using silicone stents. The authors refer to this as canaliculodacryocystoplasty (CDCP). The patients were assessed for symptoms of epiphora at 12 months. Forty-four eyes had been listed for DCR. They had been originally diagnosed, by means of lacrimal syringing, as NLD obstruction (24 eyes) or stenosis (12 eyes), and functional blocks (8 eyes).*

RESULTS. *Four out of the original 44 planned DCR surgeries were performed after re-evaluation. After re-examination, 28 lacrimal systems were found to have canalicular stenosis, 4 NLD stenosis, 4 NLD obstruction, 4 punctal phimosis, 3 ocular surface disease, and 1 patient was asymptomatic. Twenty-eight lacrimal systems underwent CDCP, 4 underwent DCR, 4 had punctoplasty, and 4 had probing alone. Three had treatment for ocular surface disease and one patient required no treatment. After a follow-up of 12 months, 41 (93%) systems had improvement or were free of their epiphora.*

CONCLUSIONS. *Syringing of the lacrimal apparatus may result in a high false positive diagnosis of NLD obstruction. Canalicular pathology is not uncommon in this cohort of patients and may be underdiagnosed. (Eur J Ophthalmol 2007; 17: 485-9)*

KEY WORDS. *Canaliculodacryocystoplasty, Dacryocystorhinostomy, Epiphora, Nasolacrimal duct obstruction*

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INTRODUCTION

The cause of epiphora can be due to excess lacrimation, disturbed ocular surface tear flow (mainly lid malposition), disturbed outflow, or a combination of these. It is essential to evaluate these accurately so that appropriate management and treatment may be applied.

In adults, the commonest cause of epiphora is primary acquired nasolacrimal duct obstruction (PANDO) and examination strategies are often directed to confirming or

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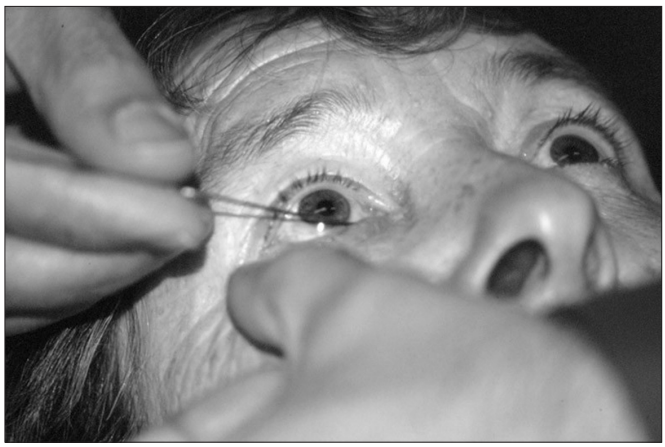

Fig. 1 - *Lower canalicular probing with a 0/0 Bowman probe.*

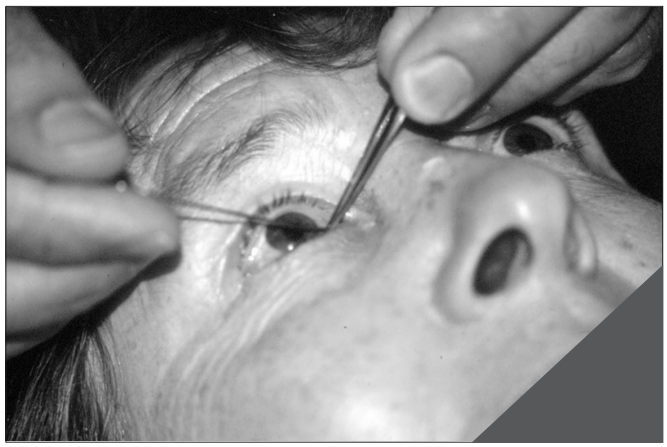

Fig. 2 - *Forceps are used to grasp the probe to assess the distance to canalicular obstruction.*

refuting this diagnosis (1). Commonly, this is done with syringing of the nasolacrimal system with saline via the lower canaliculus. If saline regurgitates via the upper canaliculus and the patient denies a salty taste of a liquid, a diagnosis of NLD obstruction may be assigned. A trained nurse or general ophthalmologist often performs this procedure. Assessment of the canalicular system, if performed, is often confined to feeling for a "hard or soft stop" distally with the lacrimal cannula. These tests are not always reliable and are subjective as well as prone to examiner bias, and subject to training and experience.

Treatment of adults with intubation of the lacrimal system has had variable success and depends on the cohort of patients (2-4).

In our study, a single examiner (B.B.) re-examined patients who had been listed for DCR by other clinicians. A methodical strategy for examination, including assessment of the canalicular system with Bowman probes, was performed.

PATIENTS AND METHODS

Patients who were already on the waiting list for DCR for longer than 6 months were identified. These patients had not previously been seen in the adnexal unit. Ophthalmologists of various grades had assessed them originally and the ophthalmologist or a nurse had performed syringing of the nasolacrimal system as the principal examination. Forty-four nasolacrimal systems of 35 patients listed for DCR were re-examined. Nine patients had bilateral epiphora so 44 nasolacrimal systems were studied. These systems had a diagnosis of NLD obstruction (24), NLD stenosis (12), or functional epiphora (8). Twenty-two patients (63%) were female. Age at presentation ranged from 26 to 90 years (mean 62 years).

They were examined by a single observer (B.B.) with a methodical strategy. This included dye disappearance and Jones I tests. If sodium fluorescein dye was recovered with a swab at the inferior meatus (Jones 1), then physiologic patency had been demonstrated and no further investigations were required.

With compromised drainage, the following technique of syringing and probing (with Bowman probes) was performed. The lower punctum was gently dilated under topical anesthesia and the canaliculus was irrigated with local anesthesia (benoxinate or amethocaine) with a lacrimal cannula. If there was regurgitation via the upper punctum, the largest lacrimal probe that could be inserted without damaging the annulus was used (0/0 Bowman probe in the majority, Fig. 1). If it entered the lacrimal sac without any resistance, the site of blockage (partial or complete) was probably the NLD. If a site of resistance was felt in the canaliculus, the probe was grasped with forceps at the punctum (Fig. 2) and withdrawn. The exposed end was measured in millimeters (Fig. 3), to identify accurately the site of the stenosis or obstruction. A smaller probe was then inserted. Resistance at the same site with the smallest probe revealed a complete canalicular obstruction. In the case of stenosis, a smaller probe could be passed through and into the sac. Syringing of the NLD then followed. This was done by insertion of a lacrimal

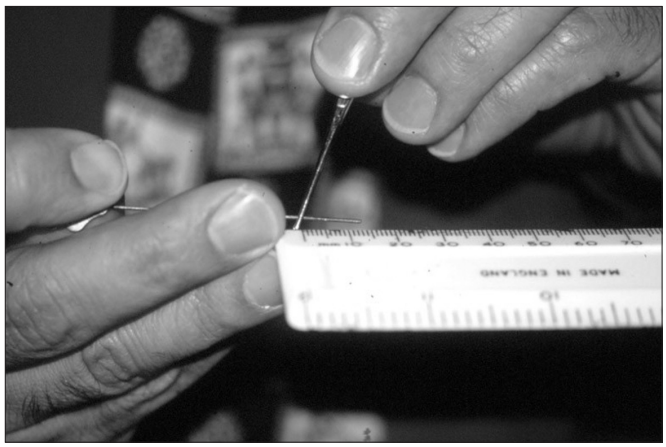

Fig. 3 - *The distance is measured with a ruler.*

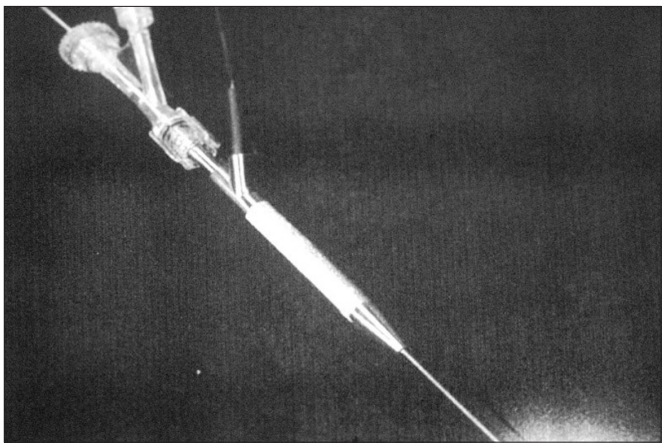

Fig. 4 - *A canalicular endoscope.*

cannula into the lacrimal sac. Then the NLD was irrigated with saline solution. The NLD was considered patent if there was a smooth flow without regurgitation. NLD stenosis was diagnosed when saline entered patient's nasopharynx but there was a clear regurgitation. NLD obstruction was noted when all irrigated fluid returned to the ocular surface. The same examination was repeated for the upper canaliculus.

All patients were also assessed for ocular surface disease (for example, dry eyes or blepharitis), lid malposition, and punctal phimosis. In addition, seven patients were also examined by an endocanalicular mini-endoscope (0.8 mm Miniflex, Laserscope) (Fig. 4).

Patients with NLD obstruction underwent DCR with silicone tube intubation, and those with canalicular and NLD stenosis were listed for canaliculodacryocystoplasty (CDCP) (28 eyes) under general anesthesia or had probing only (4 eyes). Canalicular stenoses underwent monocanalicular silicone tube intubation (Monoka, FCI Novamed) under general anesthesia, except for four eyes that had probing only. Those with common canalicular or NLD stenosis underwent bicanalicular intubation (Crawford, Altomed) under general anesthesia. The tubes were removed at 6–8 weeks in clinic.

The patients were assessed in clinic or by telephone at 1 year. They were asked if their symptom of epiphora was worse, the same, improved, or absent.

RESULTS

After re-examination, 32 systems were found to have canalicular or NLD stenosis (28 canalicular; 4 NLD), 4 NLD obstruction, 4 punctal phimosis, 3 ocular surface disease (with patent nasolacrimal systems), and 1 patient ceased to have symptoms of epiphora (Tab. I).

Canalicular endoscopy of 7 patients with canalicular stenosis confirmed the diagnoses made by the probing

TABLE I - COMPARISON OF ORIGINAL FINDINGS AND NEW FINDINGS

Original findings	New findings					
	Canalicular stenosis	NLD stenosis	NLD obstruction	Punctal phimosis	Surface disease	Epiphora free
NLD obstruction (24 systems)	17	0	4	1	2	0
NLD stenosis (12 systems)	6	4	0	2	0	0
Patent system (8 functional epiphora)	5	0	0	1	1	1

NLD = Nasolacrimal duct

technique. All 4 systems with NLD stenosis and 24 systems with canalicular stenosis underwent CDCP. The remaining 4 systems with canalicular stenosis had probing alone. The 4 NLD obstructions underwent external DCR with silicone intubation. Four systems with punctal phimosis were treated with punctoplasty (two- or three-snip procedures). Three systems had treatment for their ocular surface disease. One patient did not require any treatment.

Forty-one (93%) lacrimal systems were improved or epiphora free at 12 months. Three systems (7%) had persistent symptoms of epiphora at follow-up. Of these, one patient had had a canaliculoplasty and the other two had been probed only. No patient had worsening of his or her symptoms (Tab. II).

DISCUSSION

This study demonstrates the need for accurate assessment of patients with epiphora. Of the 24 systems with an original diagnosis of NLD obstruction, only 4 (17%) were subsequently found to have this diagnosis with our methodical approach to diagnosis and 17 (71%) were found to have canalicular stenosis. Of the 20 systems with an original diagnosis of NLD stenosis (12) or patent system (8), 11 (55%) were subsequently found to have canalicular stenosis and 4 (20%) had NLD stenosis. The reasons for the difference in diagnoses are multifactorial. Syringing of the lacrimal apparatus may result in a high false positive diagnosis of NLD obstruction. This may be due to poor technique and lack of experience.

Four (9%) systems had punctal phimosis and 3 (7%) systems had excess lacrimation. Again, it is of paramount importance to consider and look for other causes of epiphora than PANDO.

Canalicular pathology was not uncommon in this cohort of patients and was underdiagnosed. Twenty-eight (64%) systems were found to have a degree of canalicular stenosis with this method of probing. There is no other study to our knowledge to study the underdiagnosis of canalicular stenosis. Canalicular endoscopy (5) in patients demonstrated the site and type of stenosis in these patients with canalicular disease. Twenty-eight (64%) systems were treated with CDCP, 24 for canalicular stenosis and 4 for NLD stenosis. Of these patients, 27 (96%) systems had improvement or had no epiphora. Closed technique intubation has been reported to have high success rate of 90% in congenital NLD obstruction (6, 7). It can have a success rate of up to 70% in the adult population if selected appropriately. Pashby and Rathbun reported 76% success with intubation for primary canalicular and 92% for primary common canalicular disease (4).

Our favorable results may be because our patients are a selected group with canalicular and NLD stenosis, which may be more amenable to intubation. The re-evaluation of these patients, and subsequent change in management, has resulted in 8 (18%) systems not requiring major surgical intervention (4 treated with punctoplasty, 3 treated for ocular surface disease, and 1 spontaneous resolution of symptoms). They were all symptomatically improved after intervention and required no further treatment. Twenty-eight (64%) systems could be treated with closed intubation (a less involved procedure rather than DCR, not requiring an osteotomy) with 96% improvement of symptoms. Of the 4 (9%) systems that were probed only, two had no improvement of symptoms and subsequently went on to have CDCP. Two systems had improvement of

TABLE II - OUTCOME OF NUMBER OF SYSTEMS AND SYMPTOMS OF EPIPHORA AT 12 MONTHS AND TYPE OF TREATMENT

		Treatment			
Symptoms of epiphora Surface disease		**Closed intubation**	**Probing only**	**DCR**	**Punctoplasty**
Worse	0	0	0	0	0
No change	1	2	0	0	0
Improved	13	1	0	2	1
Epiphora free	14	1	4	2	2

DCR = Dacryocystorhinostomy

symptoms and required no further intervention (Tab. II).
In conclusion, a methodical approach in the assessment of patients with epiphora is necessary and probing, in the hands of an experienced ophthalmologist, can identify canalicular stenosis more readily. This may result in less invasive and major interventions. CDCP, selected appropriately, has a high success rate.

Proprietary interest: None.

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