Cinedacryocystography in the diagnosis of lacrimal obstruction in children

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SUMMARY

Purpose: To analyze the cinedacryocystography in children with congenital nasolacrimal obstruction suspicion.
Methods: The cinedacryocystographic examination was done in 143 children (58% of girls and 42% of boys) younger than 5 years old, suspected of congenital nasolacrimal obstruction. The exams were done under general anesthesia and the children were probed immediately when obstruction was detected.
Results: Epiphora, discharge or both were the most common complaints. Nevertheless 11% children had undergone unsuccessfully probing once, no one had any radiologic evaluation previously. The cinedacryocystographic exam showed nasolacrimal duct obstruction in 65,73%. Permeable lacrimal vies were presented in 34,3% of the children with epiphora. The obstruction was mainly at the Arlt's sinus. Using the cinedacryocystography, it was possible to observe the lacrimal sac enlargement and alterations in the contiguous structures such as hypertrophic turbinates (91,1%), sinusitis (44,6%) and septum deviation (24,1%).
Conclusion: Cinedacryocystographic evaluation provides important information about lacrimal system obstruction in children, therefore, it is useful in all children with suspected congenital lacrimal obstruction.

Keywords: Cinedacryocystography; epiphora; children; congenital nasolacrimal obstruction.

RESUMEN

Objetivo: Analizar la cinedacriocistografía en niños con sospecha de obstrucción nasolagrimal congénita.
Métodos: Se efectuó cinedacriocistografía en 143 niños (58% niñas, 42% niños) con edades inferiores a cinco años, con sospecha de obstrucción nasolagrimal congénita. Los estudios se llevaron a cabo bajo anestesia general con sondeo inmediato en caso de demostrar obstrucción.
Resultados: La signología habitual fue epífora, secreción o ambas. Sin embargo, 11% de los niños tenían como antecedente un sondeo infructuoso en una ocasión, y ninguno había tenido una evaluación radiológica previa. La cinedacriocistografía mostró obstrucción en 65.73% de los casos. En 34.3% de los casos con epífora se encontraron vías lagrimales permeables. La localización habitual de la obstrucción es a nivel del seno de Arlt. Con el uso de la cinedacriocistografía es posible detectar un aumento de volumen del saco lagrimal y alteraciones en las estructuras vecinas como hipertrofia de cornetes (91.1%), sinusitis (44.6%) y desviación del septum (24.1%).
Conclusión: La evaluación mediante cinedacriocistoghrafía proporciona una valiosa información acerca de la obstrucción del sistema lagrimal en niños y, por lo tanto, es de utilidad en el estudio de los niños en quienes se sospecha una obstrucción lagrimal congénita.

Palabras clave: Cinedacriocistografía; epífora; niños; obstrucción lagrimal congénita.

INTRODUCTION

The congenital nasolacrimal obstruction is present in 6% of the newborns (1, 2). The Hasner's Valve imperforation is most frequently causative factor reported (3, 4) and the most common complaint is epiphora. The epiphora usually starts between the second or third week of life after birth and

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frequently is associated to ocular discharge without "red eye". The characteristic complaint and the clinical signs, as well as the exclusion of active tearing resulting from ocular diseases, allow the diagnosis of lacrimal obstruction.

Cinedacryocystographic evaluation may confirm many lacrimal vies affection, but it is not a routine semiotic method used in the congenital nasolacrimal obstruction (9).

The purpose of this study is to describe the results of the cinedacryocystographic evaluation performed in children during the congenital nasolacrimal obstruction investigation.

MATERIAL AND METHODS

This retrospective study assessed 143 children with epiphora and suspected to have congenital nasolacrimal obstruction. The children were over 6 months and younger than 5 year-old. Exclusion criteria were previous trauma or active tearing (caused by ocular diseases).

Cinedacryocystographic exam procedure: under general anesthesia the children had the lacrimal punctum enlarged and catheterized using a 25 gauge butterfly needle adapted to a 3 ml syringe. One or 2 ml of oily contrast (Lipiodol – Guerbet) was injected into the lacrimal vies and serial images were taken.

If impatency of the lacrimal vies were detected probing was done immediately. Another radiological evaluation was taken after probing to evaluate the effectiveness of the procedure.

Gender, age of starting the symptoms and the cinedacryocystographic results were submitted to statistical evaluation according to Goodman test.

RESULTS

Fifty-eight per cent of studied children were female and 42% were males ($X^2 = 3,70$ – $P<0,05$). The age percentil 75 (P75) was 34 months.

The most common complaint were epiphora (58,0%), discharge (41,9%) and epiphora associated to discharge (32,9%). Only 2,8% of children had had acute dacryocystitis (Table 1).

The majority of the children (68,5%) were initially submitted to clinical treatment with eyedrops and/or massages; no one had underwent imagiology evaluation before, and 11,2% had already been probed at least once without epiphora resolution.

Table 1. Distribution of the complaints in children with congenital nasolacrimal obstruction suspected

Complain	*Frequency*	
	Absolute	*Relative*
Epiphora	60	41,9
Discharge	36	25,2
Epiphora and Discharge	47	32,9
Dacryocystitis	4	2,8

X2=116,5 (p<0,01)

Table 2. Distribution of the lacrimal obstruction according to cinedacryocytography in children with congenital nasolacrimal obstruction suspected

Obstruction	*Frequency*	
	Absolute	*Relative*
Absent	49	34,3
Right	35	24,5
Left	40	27,9
Both	19	13,3
Total	143	100,0

X2 = 13,3 (p<0,01)

The obstruction was located at the right side in 24,5%, at the left side in 27,9% and 13,3% bilaterally (Table 2) ($X^2 = 13,3$ – $p<0,01$).

The obstruction was in the Hasner's Valve in 16,67% and at the Arlt's Sinus in 46,91%. Nasolacrimal obstruction was presented in 65,73% and 34,3% had permeable lacrimal vies (Table 3), (figures 1, 2).

The lacrimal sac showed no dilatation in 30,25%; small enlargement in 25,92%; medium enlargement in 24,09% and a big enlargement in 5,56% of the patients (Table 4).

Cinedacrycystographic exam revealed nasal changes as septum deviation in 18,9%, hypertrophic turbinates in 78,5% and thickened nasal mucosa in 23,1% of the evaluated children.

DISCUSSION

The congenital nasolacrimal obstruction may have spontaneous resolution in the majority of the affected children (3-5). Therefore, cinedacryocystographic exam is not recommended until 12 months-old, likewise in special cases that demands early probing: in acute dacryocystitis (presented only in 2,8% of our children) or in lacrimal sac mucocele.

General anesthesia is recommended in cinedacryocystographic procedure because it is not only safe, but it minimizes the risk of lacrimal vies trauma. Moreover, it permits to institute the treatment (probing or surgery) in the same step.

The congenital lacrimal obstruction affects both sex, is unilateral and not related to the laterality of the lacrimal vies (6), as we had also observed here.

Table 3. Site of obstruction in children with congenital nasolacrimal obstruction suspected

Obstruction	*Frequency*	
	Absolute	*Relative*
Hasner's valve	27	16,67
Arlt' sinus	76	46,91
No obstruction	49	30,25
Inconclusive	10	6,17
Total	162 *	100,0

X2 = 13,3 (p<0,01)
* children with bilateral obstruction included

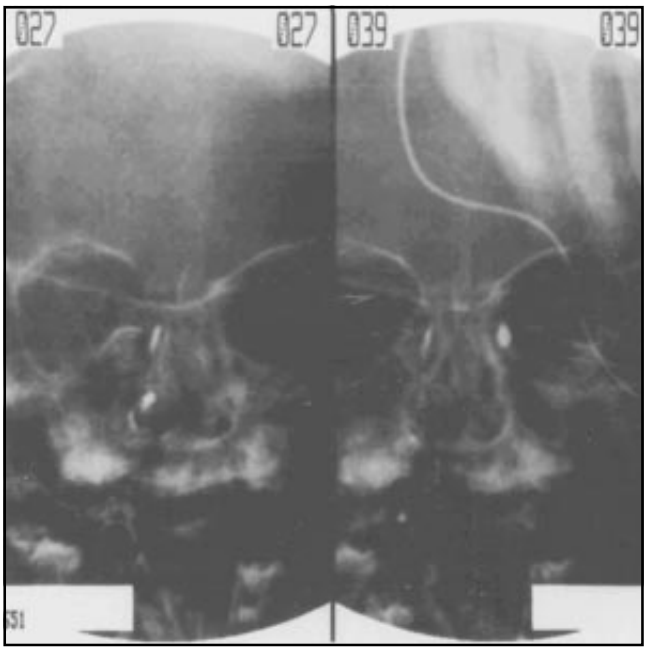

Fig. 1. Cinedacryocystography showing lacrimal vies with no obstruction on the right and with obstruction on the left side. The obstruction occurred at the Arlt sinus and the lacrimal sac is medium enlarged.

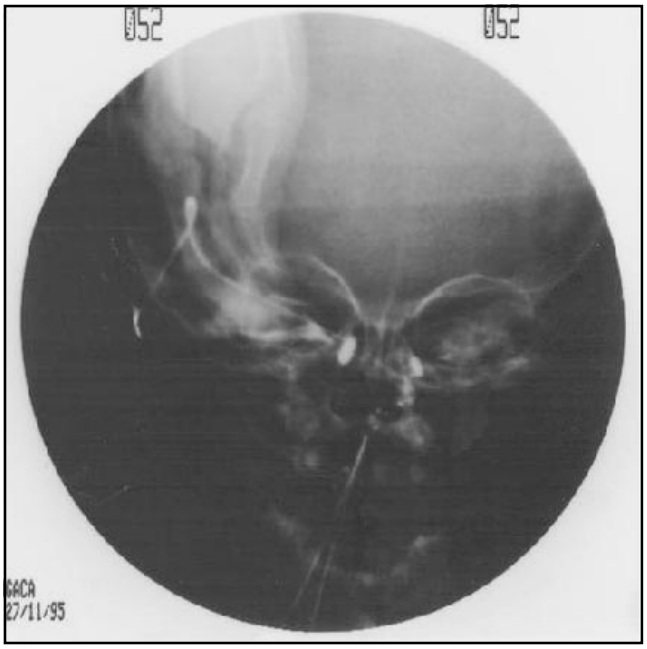

Fig. 2. Cinedacryocystography showing bilateral lacrimal vies obstruction. The obstruction is in the Arlt sinus.

Despite of the classical literature data usually report Hasner's Valve as the most common site of obstruction in the congenital nasolacrimal obstruction (3), the present study showed the obstruction mainly at the Arlt's Sinus. Others had already found the Arlt's Sinus as the site of obstruction in children, pointing out the reasons for that: double stenosis, stretched duct, impaired canalization at the Arlt's Sinus (8).

Table 4. Lacrimal sac dilatation in children with congenital nasolacrimal obstruction suspected

Lacrimal sac dilatation	*Frequency*	
	Absolute	*Relative*
No dilatation	49	30,25
Small enlargement	42	25,92
Medium enlargement	39	24,07
Huge enlargement	9	5,56
Inconclusive	23	14,2
Total	162 *	100,0

X2= 33,27 (p<0,01)

*children with bilateral obstruction included

Another reason to have more cases with Arlt's Sinus obstruction might be related to the outcome of the patients with the possibility to have spontaneous cure when the Hasner's Valve is the place of obstruction and to reach the necessity to probe when the obstruction is located at the Arlt's Sinus. Anyway, other studies might be necessary to show the main obstruction site related to the congenital nasolacrimal vies obstruction.

Other information obtained with the cinedacryocystographic exam is the lacrimal sac enlargement, presented in many children and sometimes remarkable, suggesting poor outcome even after probing (7).

The epiphora in congenital nasolacrimal obstruction starts between 2 or 3 weeks after birth. Nevertheless, it is not unusual to observe children under 6 months-old starting epiphora complaints. These children may not have effective congenital nasolacrimal obstruction, but in fact, a pseudo-obstruction (6, 7) which will not be solved by probing. The pseudo-obstruction may be the cause of epiphora in children whose cinedacryocystographic evaluation reveals permeable lacrimal system which was observed in 34,3% of the children studied here.

Likewise, nasal changes may be verified by cinedacryocystography and were presented in expressive number of children. Nasal alterations would be responsible for pseudo-obstruction, with intermittent secondary epiphora or respiratory stress in neonates (9).

In conclusion, the cinedacryocystographic exam showed many changes in the lacrimal vies system and the nearby structures, providing additional knowledge thus emphasizing the importance of the exact localization of the obstruction and the anatomical outline of the system. All these information might be useful in every case of congenital nasolacrimal obstruction before probing, allowing better outcomes.

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Cita histórica:

En 1941, **Gregg** describe, en Australia, a la rubéola como agente teratogénico *(Gregg N. Congenital cataract following German measles in the mother. Trans Ophthalmol Soc Aust 3:35, 1941).* No fue sino hasta 1962, durante la pandemia entre 1962 y 1964, que se aisló el virus, desarrollándose la vacuna en 1969.