

The result of probing to the patients with congenital nasolacrimal duct obstruction above age 24 months

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Abstract:

Background: Congenital nasolacrimal duct obstruction (CNLDO) is a common ophthalmic problem and may be present in up to 20% of newborn. Conservative management with topical antibiotics and lacrimal sac massage are appropriate during the first 12 months of age and 96 percent of Congenital nasolacrimal duct obstruction resolves with conservative management. **Aim of this study:** To determine the effectiveness of nasolacrimal probing in patients having congenital nasolacrimal duct obstruction above age 24 months. **Patients and methods:** This is a randomized prospective study in which 43 eyes of 37 patients above age 24 months years old and having congenital nasolacrimal duct obstruction with follow up period at least 6 months, the procedure was done under general anesthesia in Al-Sadder teaching hospital and postoperative steroid- antibiotic eye drops for 3 weeks. Patients were grouped into two groups according to their ages: group one age (24 months -35 months) ,group two (36-48 months). **Results :** There were 37 children enrolled in this prospective study. The age of the studied group was 24 -48 months , furthermore, by distribution of the studied group according to two age categories it had been found that 28 patients(75.7%) of the studied group aged 24 – 35 months and the remaining 9 patients(24.3%) aged 36 – 48 months. Regarding the gender, males were the dominant represented 20/37(54.1%) of the studied group compared to 17 females(45.9%) represented the remaining with a male to female ratio of **1.2:1**. The left eye involved in 18(24%) patients and the right eye involved in 13 patients(19%) while both eyes involved in 6 patients(43%) with a

total number of 43 involved eyes ; (24 left and 19 right). **Conclusion:** In conclusion, our results is the first report of results of probing for congenital nasolacrimal duct obstruction of children above age 24 months in Iraq. In this study shows statically significant results of probing for less than half of patient after 6 months follow up with encourage to do simple probing at early age .

Introduction:

Congenital Nasolacrimal duct obstruction :

Duct obstruction is perhaps better termed delayed canalization since it often resolves spontaneously. The lower end of the nasolacrimal duct (at the valve of Hasner) is the last portion of the lacrimal drainage system to canalize, complete patency usually occurring soon after birth. Epiphora affects approximately 20% of neonates, but spontaneous resolution occurs in 96% of cases within the first 12 months⁽¹⁾.

Signs

Epiphora and matting of lashes may be constant or intermittent, occurring particularly when the child has a cold or upper respiratory tract infection.

Gentle pressure over the lacrimal sac causes reflux of purulent material from the puncta⁽¹⁾

Differential diagnosis:

The differential diagnosis of nasolacrimal duct obstruction includes conjunctivitis, epiblepharon ,blepharitis and congenital glaucoma.

Nonsurgical management:

The most important initial measure is digital massage of lachrymal sac. Instillation of topical antibiotics several times per day over period of one to two weeks may clear secondary infection but should be considered adjunctive treatment that does not address the underlying problem. the antimicrobial agent should be cover abroad spectrum bacteria .

Massage serves two purposes :it empties the sac ,reducing the opportunities for bacterial growth , and it applies hydrostatic pressure to obstruction that occasionally opens the duct and permanently relieves the condition and to create sufficient pressure to accomplish the latter goal ,it is preferable to compress the sac while occluding the canaliculi. The child"s caregiver is

instruct to place a finger above the medial canthus and then firmly press and slide the finger downward.

Surgical treatment :

The timing of surgery for congenital nasolacrimal duct obstruction is controversial ,since this condition resolve spontaneously with conservative treatment in many cases. Published secondary have shown clearing without probing in 70 percent of patient by age one year .

Early probing (i.e. before one year) reduces the duration of bothersome symptoms , the burden of conservative management .and the potential for chronic infection ,however delaying probing beyond age one year may avoid surgery altogether ,despite the classic view that the rate of spontaneous resolution is significantly reduced by chronic infection .

A small proportion of newborns with congenital nasolacrimal duct obstruction have anatomical variation that are unlikely to resolve spontaneously or relieve by simple probing.⁽²⁾

Probing:

Probing must be done with care ,since the tarsal plate does not extend into the portion of the eyelid containing the canaliculi ,which consequently are easily torn. Probing can be done in the office under topical anesthesia with infant securely immobilized ,avoiding general anesthesia and the trouble and expense of even brief hospitalization .

Probing under general anesthesia in the operating room setting gives increased control and provides the additional advantage of allowing evaluation and treatment of an obstructing inferior turbinate or an intranasal mucocele and of employing balloon dilation or intubation if indicated.

Describing the technique used in probing is difficult as much of procedure involves the sense of touch rather than sight an must be experienced . The surgeon dilates the upper or lower punctum and canaliculus and proceeds directly to probing or attempts to relieve the obstruction by irrigating a small amount of saline under no more than moderate pressure from a syringe attached to a blunt-tipped cannula introduced into the lacrimal sac ; if irrigation is not successful at relieving the obstruction ,inability to irrigate will

at least confirm it.

Even if irrigation is successful ,the surgeon should proceed with probing .A bowman probe (usually #0 or #1; finer probe are too flexible , and" feel "of their placement is less precise) is advanced along the canaliculus toward the sac .The surgeon should sense easy passage of the probe through the canaliculus ; if this is not the case ,gradually increasing force should be applied to clear what is probably a canalicular stenosis . However ,extreme force should be avoided to minimize possible injury to this structure.

When probe tip encounters the nasal wall of the bony lacrimal fossa and overlying sac tissues ,the probe is very slightly backed off the nasal wall and pivoted so that it is direct downward toward the floor of the nose. Lateral traction on the lower eyelid should be discontinued while the probe is pivoted. If there is distal membranous obstruction as the probe advances through the nasolacrimal duct obstruction ,a sudden decrease in resistant is felt when obstruction is overcome .

Many surgeon confirm the presence probe tip in the nose by introducing a second underneath the inferior turbinate and an observing of the first probe as second rubs directly against it. Alternatively ,direct inspection with the nasal speculum and headlamp or with a nasal endoscope can determine the precise position of the probe. The degree of force to exert against an obstruction is a matter of judgment that is again based on experience .

Optional postoperative medication include antibiotic drop ,corticosteroid drops or both two to four times per a day for up to two weeks .Phenylephrine 1\8 percent nose drops can be used concurrently for 3 to 5 days to promote tear drainage by

Resolution of signs after probing may not occur until one week or more after discontinuation of postoperative treatments .Recurrent after unsuccessful probing usually is evident within two months If initial attempt to relieve congenital nasolacrimal duct obstruction with probing is unsuccessful ,repeating the procedure may be sufficient. The success rate of properly performed initial probing for congenital nasolacrimal duct obstruction exceed 90 % in infant up to 15 months old. Simple probing first performed after age

24 month fail to relieve symptoms in as many as one third in some series ,not necessarily because of inability to relieve the obstruction , but because of recurrent closure caused by scarring from prolong inflammation or by diffuse stenosis of bony lacrimal canal.

Common undesired outcome of probing is creation of a false passage into nose , either from faulty manipulation of the probe or because of anatomical variation. The usual consequences of false passage is simply postoperative persistence of symptoms ,but the damage to the tissues lining the canalicular or nasolacrimal duct can cause scarring that increases the difficulty of subsequent efforts to relieve obstruction. Significant complications of probing are otherwise rare.

In some cases, mild epiphora still occurs occasionally , particularly outdoors in cold weather or in conjunction with an upper respiratory tract infection. This epiphora probably is attributable to a patent but narrow lacrimal drainage channel that becomes occluded when the nasal mucosa swell. Usually no additional treatment is required.

Balloon dilation:

In recent years ,an inflatable balloon integrated on a probe has become a popular method for dilating a lachrymal drainage system that appears to be blocked by scarring or constriction rather than merely by distal membrane. ⁽³⁾
⁽⁴⁾

Intubation :

Intubation of lacrimal system usually is recommended when one or more simple probing or balloon dilations have failed. However ,it has been employed as primary treatment over a broad age range of pediatric patient⁽⁵⁾ ⁽⁶⁾
⁽⁷⁾ ⁽⁸⁾

Patients and methods:

In this prospective cohort case study series (43) eyes of (37) patients between 2 years and 4 years old with congenital nasolacrimal duct obstruction were probed under general anesthesia by one surgeon from February 2014 to September 2014. . Informed consent was obtained from all parents each study patient.

Congenital nasolacrimal duct obstruction was diagnosed clinically by the presence of

epiphora beginning during the first few weeks of life and presence of at least one sign of congenital nasolacrimal duct obstruction (epiphora, increased tear lake, and/or mucopurulent discharge or reflux of contents of the lachrymal sac with pressure in the absence of upper respiratory tract infection, ocular surface irritation or glaucoma). Exclusion criteria included history of prior nasolacrimal surgery, craniofacial anomalies, history of trauma, Down syndrome, congenital dacryocystocele, punctum agenesis, and associated ocular disease.

The surgery procedure was performed by one surgeon under brief inhalation anesthesia. After dilatation of the upper punctum, a Bowman's probe (0 and 00) was introduced vertically into the punctum and ampulla and then rotated horizontally 90° in the same plane to enter the canaliculus, with lateral tension placed on the lid. The probe was then advanced until it touched a region of bony firmness; this indicate that it had reached the lacrimal sac. Then, the probe was rotated upward 90° and advanced down to the nasolacrimal meatus until it gave way through the membranous resistance into the nasal cavity. At this stage, we used another probe for detection of metal-to-metal contact below the inferior turbinate. The "patency of the nasolacrimal system was evaluated by irrigation of saline through the superior punctum, flow of saline into the nose was confirmed by a pediatric size suction catheter that was placed below the inferior meatus. Patients were placed on topical medication (steroid and antibiotics) for 2 weeks after the procedure.

Patients were followed up at 1 month and 6 months after probing. At each follow-up visit, parents were questioned about the symptoms and patients were examined for the presence of epiphora, increased lacrimal lake, mucous discharge, and/or regurgitation with pressure over the lacrimal sac. Complete resolution was defined as the absence of clinical signs of congenital nasolacrimal duct obstruction on examination and not having the patient's history of residual symptoms of congenital nasolacrimal duct obstruction. The result was graded as partial, the parents reported symptoms of intermittent epiphora or matting, but clinical examination did not show signs of congenital nasolacrimal duct obstruction. Both complete and partial resolution was

defined as an improvement. Patients with clinical signs of congenital nasolacrimal duct obstruction on examination and constant symptoms were graded as a failed response.

Results

Baseline characteristics of the studied group:

There were 37 children enrolled in this prospective study. The mean age of the studied group was (30.1 ± 5.9) months , with a range of 24 – 48 months, furthermore, by distribution of the studied group according to two age categories it had been found that 28 patients (75.7%) of the studied group aged 24 – 35 months and the remaining 9 patients (24.3%) aged 36 – 48 months. (Fig 1)

Regarding the gender, males were the dominant represented 20/37 (54.1%) of the studied group compared to 17 females represented the remaining 45.9% with a male to female ratio of **1.2:1**. (Fig. 2)

The left eye involved in 18 patients (48.6%) and the right eye involved in 13 patients (35.1%) while both eyes involved in 6 patients with a total number of 43 involved eyes ; (24 left and 19 right), (Fig. 3).

Table 1: Baseline characteristics of the studied group

Variable		No.	%
Age (month)	24 - 35	28	75.7
	36 - 48	9	24.3
	Total	37	100.0
	Mean \pm SD	30.1 ± 5.9	-
	Range	24 - 48	
Gender	Male	20	54.1
	Female	17	45.9
	Total	37	100.0
	Male : Female ratio	1.2:1	-
Eyes	Left	18	48.6
	Right	13	35.1

Both eyes	6	16.2
Total	37	100.0

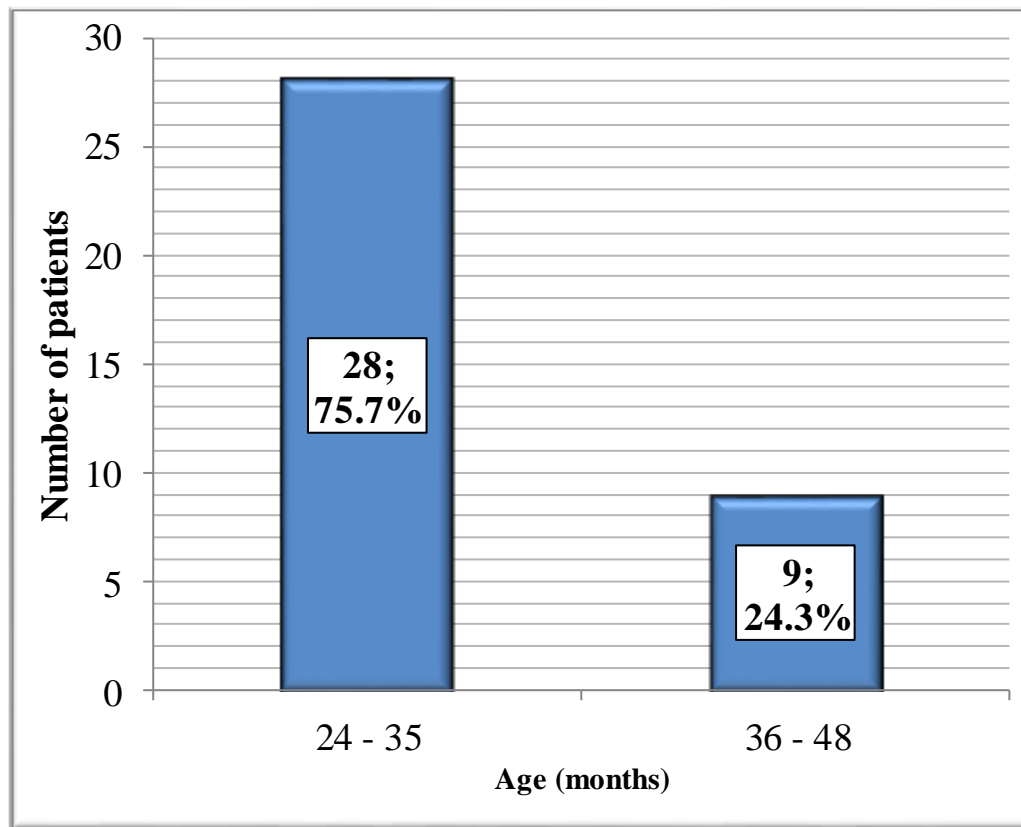


Figure 1. Distribution of the studied group according to the age group

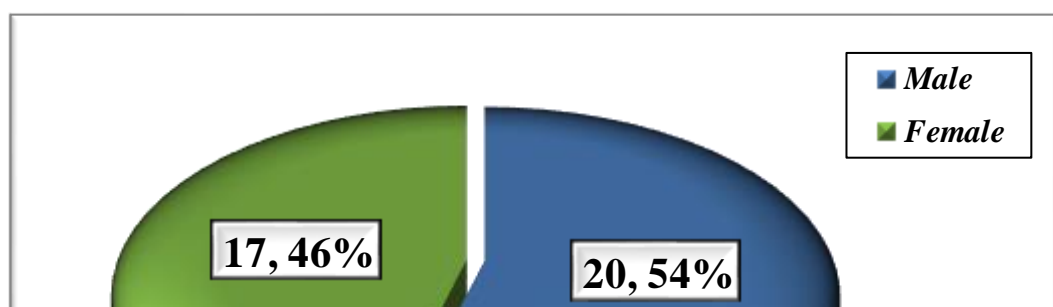


Figure 2.Distribution of the studied group according to gender.

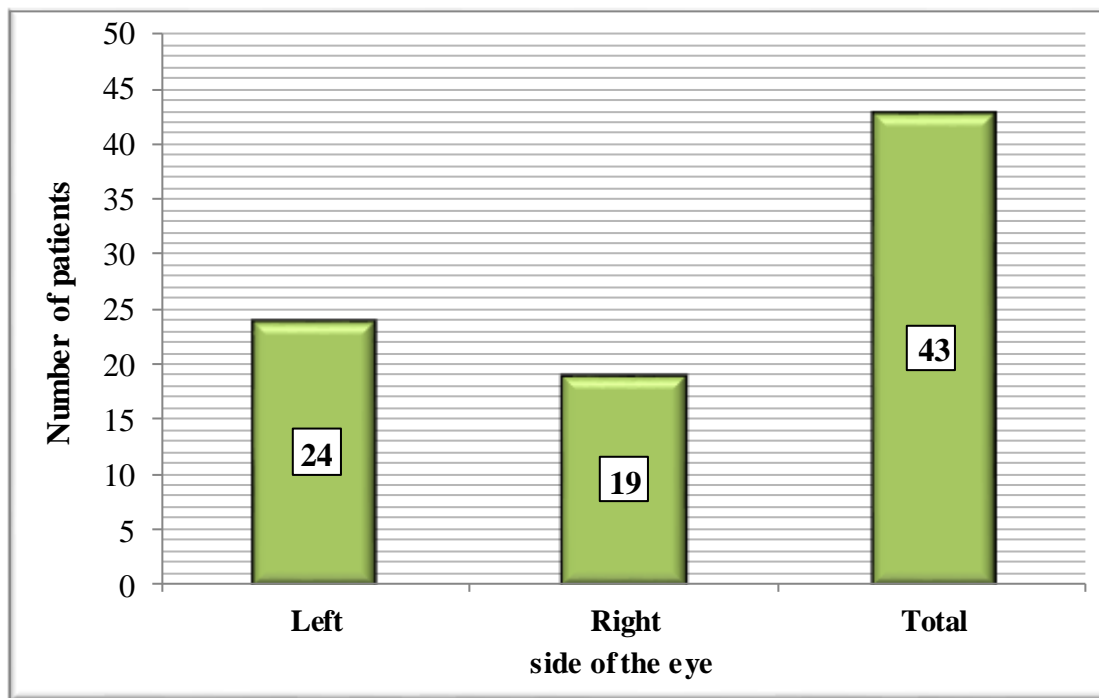


Figure 3.Distribution of total numbers of eyes involved according to the side of the eye

Success rates:

As it shown in table 2, the overall success rate was 46.5%, where the operation was successful in 20 eyes. From other point of view, the success rate was lower in the left eye than right, 41.7% vs. 56.2, respectively, however, the difference in success rates between both eyes was statistically insignificant, $P=0.41$, (Table 3 and Fig. 4).

Table 2. Overall Success rates of the 43 involved eyes

Success	Number	Rate (%)
Successful	20	46.5
Failed	23	53.5
Total	43	100.0

Table 3. Success rates according to the side of the involved eye

Involved eye	Successful		Failed	
	No.	%	No.	%
Left eye	10	52.6	9	47.4
Right eye	10	41.7	14	58.3

Total	20	46.5	23	53.5
Chi square = 0.51 P.value = 0.41 (not significant)				

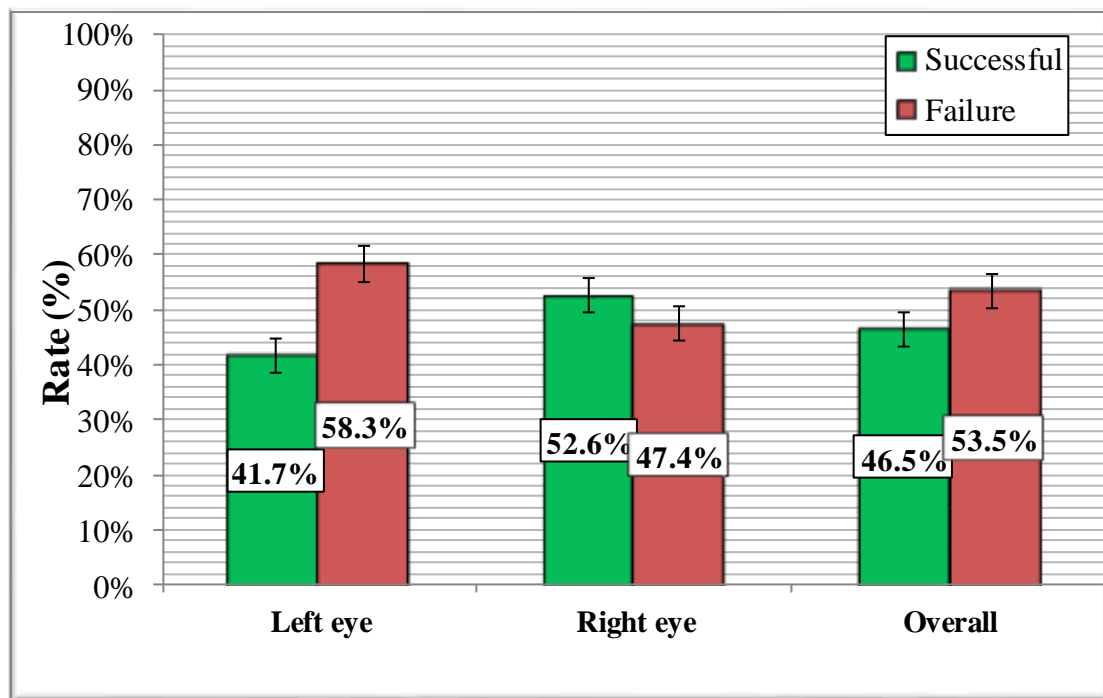


Figure 4. Success and failure rates according to the eye involved

Table 4 shows the distribution of success rates according to the age of the studied children, it had been found that the operation succeeded in 17 eyes of the children who aged 24 – 35 months compared to only 3 eyes in those aged 36 – 48 months, this

indicated higher success rates in younger age group than older 54.8% vs. 25%, respectively, and the difference in success rates between both age groups was statistically significant, (P=0.039), (Fig. 5)

Table 4. Success and failure rates according to age

Age	Successful		Failed	
	No.	%	No.	%
24 - 35	17	54.8	14	45.2
36 - 48	3	25.0	9	75.0
Total	20	46.5	23	53.5
Chi square = 6.2 P.value = 0.039 (Significant)				

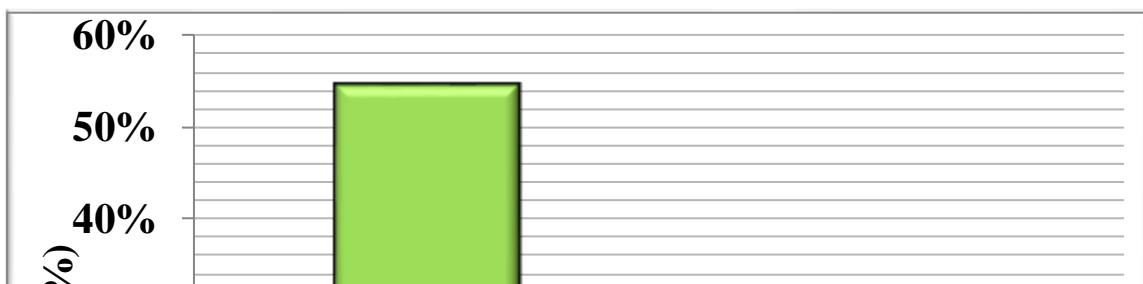


Figure 5. Comparison of success rates between both age groups

Regarding the correlation between success rate and the gender it had been found that the success rate was higher in males than females, 54.2% vs. 36.8%, respectively, however, the difference was statistically insignificant, $P > 0.05$, (Table 5 and figure 6).

Table 5. Success and failure rates according to gender

Gender	Successful		Failed	
	No.	%	No.	%
Male	13	54.2	11	45.8
Female	7	36.8	12	63.2
Total	20	46.5	23	53.5
Chi square = 1.3 P.value = 0.26 (not significant)				

Statistical analysis:

The statistical package for social sciences (SPSS) software version 21, 2013, was used for analysis and management of the patients' data. Descriptive statistics of the

studied group were presented as numbers and percentages in addition to the mean and standard deviation. Chi square was used to compare the success rates and to assess the significance of differences. Level of significance, $P. value \leq 0.05$, was considered as significant difference or, finally, the results and findings were presented in tables and or figures with appropriate explanation for each

Discussion:

Congenital nasolacrimal duct obstruction (CNLDO) is a common ophthalmic problem and may be present in up to 20% of newborn. Conservative management with topical antibiotics and lacrimal sac massage are appropriate during the first 12 months of age and 94 percent of CNLDO resolves with conservative management. Nasolacrimal duct probing is usually considered beyond the age of one year. but many studies showed that late initial probing after 2 years of age gave a good result although probing success rate may decrease with increasing age.

In this study, we found that the operation succeeded in 17 eyes of the children who aged 24 – 35 months compared to only 3 eyes in those aged 36 – 48 months, this indicated higher success rates in younger age group than older " 54.8% vs. 25%", respectively, and the difference in success rates between both age groups was statistically significant, ($P=0.039$), and this is consistent with other studies done by Young JD, MacEwen CJ, Ogston SA study⁽⁹⁾ and Mannor GE, Rose G⁽¹⁰⁾, and Honavar SG, Prakash VE, Rao GN⁽¹¹⁾ and Perveen S, Sufi AR, Rashid S, Khan A; ⁽¹²⁾. And Ciftçi F, Akman A, Sönmez M, Unal M, Güngör A yaylal⁽¹³⁾, all these studies found decrease success rate with increasing age, but other studies done by Limbu B, Akin M, Saiju R⁽¹⁴⁾ shows the success rate in children age 24 to 36 months was 90.2% (55/61 eyes), and 72.9% (35/48 eyes) in age 36 to 48 month ($p=0.018$) and this indicate decrease rate with increased age which consistent with our study but with high success rate for both ages

Another study done by Repka MX, Chandler DL, Beck RW, Crouch ER, Donahue S, Holmes JM, et al⁽¹⁵⁾ is consistent with our study but also with high success rate for both age group (79 %) for 37 eyes in children 24 to 36 month and 56 percent for 11 eyes in children 36 to 48 months.

In others study done by Katowitz, J.A and Welsh, M.G⁽¹⁶⁾ show that the success rate was very low and there is no differences between both age group which is (33 %).

Robb⁽¹⁷⁾ El Mansoury et al⁽¹⁸⁾ and Zwaan⁽¹⁹⁾ have reported an insignificant effect of the increasing age on the success rate .another study by Yap EY, Yip⁽²⁰⁾ shows that Success rate was 75% for all age and that also inconsistent with our study. And another study done by Maheshwari R, Maheshawari⁽²¹⁾ is also inconsistent with our study with high success rate 80 percent for both age group between 24 months and 60 months ,also another study done by Kassoff J, Meyer DR⁽²²⁾ are inconsistent with our study.

Other studies which are inconsistent with ours are Zilelioglu G, Hosal BM⁽²³⁾ schellin S, Narikawa S, Ribeiro SC, Nakagima V Padovani CR⁽²⁴⁾ schellini SA, Viveiros MM, Jaqueta E, Padovani CR⁽²⁵⁾, all these studies shows no differences in success rate with increasing age.

In this study regarding the left or right side shows that the left eye was involved in 18 patients (48.6%) and the right eye was involved in 13 patients (35.1%) while both eyes involved in 6 patients with a total number of 43 involved eyes ; (24 left and 19 right) however, the difference in success rates between both eyes was statistically insignificant, $P=0.41$, which consistent with study done by Arora S, Koushan K, Harvey JT⁽²⁶⁾ who is found no differences between both sides of the eyes.

Conclusion

This study shows effectiveness of probing for patient with congenital nasolacrimal duct obstruction above two years in Iraq . This study showed statistically significant decrease in success of probing of obstruction for patient with increasing age after 6 months follow up.

Recommendations:

1. We encourage to do probing for children older than two years with congenital nasolacrimal duct obstruction even with low rate of success.
2. We recommend for the next researches to increase sample size to get more accurate results.
3. We recommend for the next researches to follow-up the patients for longer duration than six months to evaluate effectiveness with older age.

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فعالية عملية فتح مجرى الدمع للأطفال فوق سن الثانية من العمر بعد فترة ستة أشهر من إجراء العملية

الخلاصة:

المقدمة : يعتبر انسداد مجرى الدمع الولادي من اكثر الحالات شيوعا فهو يحدث عند اكثر من عشرون بالمائة من الولادات ولكن أكثر من ٩٠% يشوفون قبل السنة الأولى وتعالج معظم الحالات علاج تحفظي ولكن بعد السنة الأولى يحتاج المرض لفتح انسداد مجرى الدموع بعملية فتح مجرى الدمع والتي تقل نسبة النجاح عادة بعد عمر السنتين .

الهدف من البحث: هو معرفة مدى نجاح وفعالية فتح مجرى الدمع للمرضى بعد سن الثانية من العمر ومدى نجاح العملية للأطفال كلما زاد معدل العمر بعد ست أشهر من المتابعة لعملية فتح مجرى الدمع.

طريقة البحث: تم اخذ عينة مكونة من ٤٣ عين ل ٣٧ اطفال يعانون من انسداد مجرى الدمع الولادي بعد عمر السنتين في مستشفى الصدر التعليمي وتم اجراء عملية فتح مجرى الدمع بعد ان تم تقسيمهم الى مجموعتين عمريتين من سن ٢٤ شهر الى ٣٥ شهر ومجموعه من سن ٣٦ شهر الى ٤٨ شهر وبعد اجراء العملية وإعطاء المريض علاج على شكل قطرات مضاد حيوي وسترويدات لمدة ثلاث أسابيع ثم تمت متابعه الحالات لفترة على الاقل لمدة ستة اشهر بعد اجراء العملية .

النتائج:

كانت النتائج ل(٣٧) مريض مقسمه حسب الفئات العمرية الاولى ما بين ٢٤ الى ٣٥ شهر وكان (٢٨) مريض والفئة العمرية الثانية ما بين ٣٦ الى ٤٨ شهر هي (٩) مرضى .ولفترة ستة اشهر من اجراء عملية فتح مجرى الدمع.

الفئة العمرية الاولى كانت النتيجة نسبة النجاح ٥٤,٨ % بينما كانت النتيجة للفئة العمرية الثانية ٢٥ % فقط . بالنسبة لنسبه النجاح للذكور اعلى من الاناث ٥٤,٢ مقابل ٣٤,٨ % هي نتيجة إحصائية غير معتد بها. وكانت النتائج العين اليمنى اعلى من العين اليسرى وكانت ٥٦,٢مقابل ٤١,٧ % وهي نتيجة احصائية لا يعتد بها.

الاستنتاجات: على حد علمنا هذا هو التقرير الاول حول متابعة المرضى الذين يعانون من انسداد مجرى الدمع واجراء عملية فتح مجرى الدمع ومتابعه حالتهم لمدة ستة اشهر وقد وجدنا خلال البحث انخفاض نسبة نجاح العملية مع ازدياد الفئات العمرية بالنسبة للأطفال لما فوق السنتين .