Research Article

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Epidemioclinical Profile of Congenital Obstructions of the Excretory Lacrimal Ducts in Children Aged 0 to 48 Months in Lubumbashi

Twite Badye F[1]*, Ngoie Maloba V[1], Kintadi Luyingila G[1], Kimenyembo Kasongo W[1], Shombo Djoma A[2], Tambwe Ndumb H[1] and Chenge Borasisi G[1]

[1]*Ophthalmology Department, University of Lubumbashi, Faculty of Medicine, Democratic Republic of Congo.*

[2]*Afia Don Bosco Polyclinic, Democratic Republic of Congo.*

***Correspondence:**

Twite Badye Francine, Ophthalmology Department, University Clinics of Lubumbashi, Faculty of Medicine, Democratic Republic of Congo, Tel: +243 993 446965, +243 816 610943.

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ABSTRACT

Introduction: *The aim of this study was to evaluate the frequency of congenital obstruction of the excretory lacrimal ducts (OCVLE) in children aged 0 to 48 months and to describe its main clinical and therapeutic characteristics, in order to contribute to the adaptation of management in our context.*

Methodology: *This was a prospective cohort study with data collection conducted between March 2025 and March 2026. We consulted 74 patients aged 0 to 48 months. All underwent a complete ophthalmological examination. The study variables were: sex, reason for consultation, current weight, main complaint, intraocular pressure, treatment, and outcome.*

Results: *This study was based on 74 patients, including 39 (52.7%) girls and 35 (47.3%) boys, for a sex ratio of 0.9. Patient age ranged from 0.5 to 48 months. Patients aged 0 to 6 months represented 58%. Tearing and purulent discharge were the most common symptoms. Lacrimal duct obstruction associated with lacrimal conjunctivitis was observed in 81.1% of cases . Conservative treatment consisted of lacrimal sac massage combined with antibiotic eye drops. Lacrimal duct probing was performed in 40.2% of patients, including 90.3 % cases of lacrimal duct permeability.*

Conclusion: *Occlusive bleeding is a common condition in Lubumbashi, characterized by excessive tearing and chronic purulent discharge. Early and appropriate medical management generally yields good results.*

Keywords

Occlusion, Congenital, Lacrimal ducts, Excretory, Symptoms, Treatment, Lubumbashi.

Introduction

Congenital occlusion of the excretory lacrimal ducts (COLD) is a developmental anomaly of the lacrimal ducts, characterized by a congenital obstruction that impedes the normal drainage of tears. It can be related to an imperforate or incomplete tunneling of the lacrimal ducts, potentially affecting different segments of the excretory lacrimal system [1]. The most frequent congenital obstruction occurs at the nasolacrimal duct due to the persistence of Hasner's membrane at its distal end [2].

Occlusive tear obstruction (OTLO) is the leading cause of epiphora in infants, affecting approximately 5 to 20% of newborns worldwide. Epiphora is therefore a frequent reason for consultation in pediatric ophthalmology [3]. It corresponds to an excessive flow of tears, which can result from a mechanical obstruction in the path of the excretory lacrimal ducts [4].

Clinically, tearing is the main sign of a central venous obstruction (CVO). It may be clear when the obstruction is located upstream of the lacrimal sac, or become mucopurulent due to microbial

proliferation caused by tear stasis. Other manifestations may be observed, including erythematous edema containing clear or purulent fluid (mucocele or dacryocystocele).

The management of occlusive tear obstruction (OTI) initially relies on a conservative approach, combining ocular hygiene, massage of the lacrimal sac, and, in cases of secretions or infection, local treatment with antibiotic or antiseptic eye drops. In children with persistent obstruction despite medical treatment, particularly beyond 12 months of age, probing of the lacrimal ducts under anesthesia may be considered [5].

In Lubumbashi, data regarding the frequency and clinical characteristics of occlusive diarrhea (OD) remain limited. The present study aims to evaluate the frequency of OD in children aged 0 to 48 months and to describe its main clinical and therapeutic characteristics, in order to contribute to adapting management in our setting.

Methodology

This was an analytical cohort study conducted at the Sainte-Yvonne Ophthalmological Clinic (COSY) over a 12-month period, from March 2025 to March 2026. The study included 74 patients aged 0 to 48 months, seen during the study period, presenting with tearing and/or mucopurulent discharge, in whom a diagnosis of occlusive laryngeal dysplasia (OLD) was made following clinical examination. The sampling method was non-probability convenience sampling.

After a detailed interview, all patients underwent a complete ophthalmological examination. The variables studied were: age, sex, current weight, age at first consultation, main complaint, visual acuity, intraocular pressure, diagnosis, treatment received, and clinical course. The diagnosis of occlusive lacrimal occlusion (OLOC) was based on the patient's history and clinical signs, including the nature and chronicity of symptoms, inspection of the eyes and adnexa, slit-lamp examination, lacrimal sac pressure, and intraocular pressure (IOP) measurement. Management included a medical component and, when indicated, a surgical component. Medical treatment, initiated primarily in patients aged 0 to 12 months, combined lacrimal sac massage using the Crigler method with antibiotic and/or antiseptic eye drops. The massage described by Crigler in 1923 consists of applying directed pressure to the lacrimal sac in order to promote the opening of the distal obstruction and facilitate the drainage of secretions.

Surgical treatment was indicated for patients aged 12 to 48 months with persistent obstruction and consisted of probing the lacrimal ducts under general anesthesia. Free and informed consent was obtained from the parents before the probing was performed.

The survey took place in the operating room; the patients were Under general anesthesia, the following procedure was performed: first, the affected eye was disinfected, then the lacrimal puncta were dilated using dilating stylets of various gauges. Probing was then performed using a sterile Bowman probe, size 0 and then 1 as appropriate. The probe was inserted vertically at the level of the lacrimal puncta, then horizontally until it made contact with bone. It was then guided downwards and backwards, following the path of the nasolacrimal duct, until it reached the floor of the nose. Irrigation with saline solution was then performed to verify the patency of the lacrimal duct and its passage into the nasal cavities.

Postoperatively, patients received antibiotic eye drops combined with an anti-inflammatory for 10 days. A second follow-up appointment was scheduled after one month to assess clinical progress, particularly the resolution of tearing and purulent discharge. Catheterization was performed only once in these patients.

Data entry and analysis were performed using Microsoft Excel and IBM SPSS Statistics version 25. Quantitative variables were described by mean, standard deviation, minimum, and maximum. Qualitative variables were presented as counts and percentages.

Results

Hospital Frequency

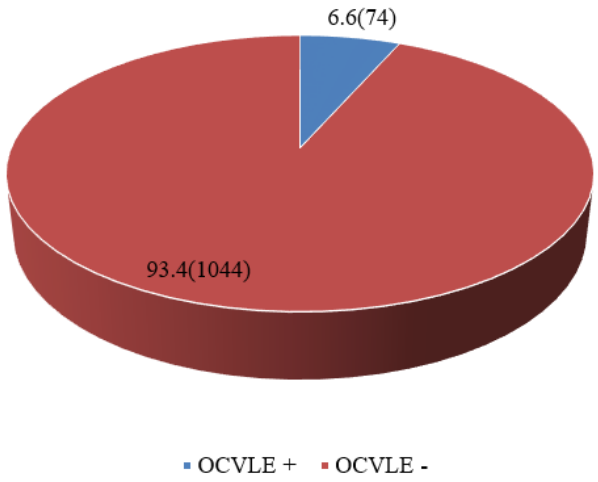


Figure 1 : Hospital frequency of OCVLE.

Over a 12-month period, congenital lacrimal duct occlusion was observed in 74 patients out of a total of 1118 examined, corresponding to a hospital frequency of 6.6 %. The pathology was bilateral in 14 patients and unilateral in 60 patients, for a total of 88 eyes.

Patient Characteristics

Age at first consultation

Table 1: Distribution of patients according to age groups.

Age (months)	Effective	Percentage
[0 - 7]	43	58.1
[7 - 12]	12	16.2
[12 - 48]	19	25.7
Total	74	100.0

The age of the patients included in the study ranged from 0.5 to 48 months, with a mean of 10.1 ± 10.7 months. The age group between 0 and 6 months comprised 43 cases, representing 58.1% of all patients.

Sex and current weight

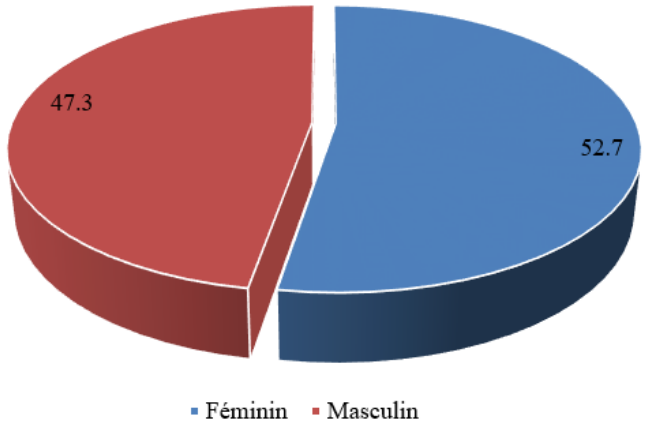


Figure 2: Distribution of patients by sex.

This study revealed that girls represented 52.7% (n=39) of cases, compared to 47.3% (n=34) of cases. The sex ratio was 0.9.
The current weight of the patients varied from 3.7 kg to 15 kg with an average of 7.9±2.7 kg.

Clinical Aspects

Symptoms

Table 2: Distribution of patients according to symptoms.

Symptoms	Effective	Percentage (%)
Tearing	66	89.2
Purulent secretions	65	87.8
Tickling	15	20.3
Eyelid edema	6	8.1
Nasal swelling	3	4.1
Eye redness	5	6.8

Tearing was reported in 66 patients, or 89.2%, and secretions were observed in 87.8%.

Visual Acuity

Table 3: Distribution of patients according to visual acuity of both eyes.

AV	AV corresponding	Number (%)
6/12	5/10	2 (2.7)
6/9.5	6/10	2 (2.7)
6/7.5	8/10	5 (6.8)
8.0; 4.0; 3.0	10/10	48 (64.9)
PL	-	11 (14.9)
Not determined		6 (8,1)
Total		74(100,0)

Values of 10/10 were observed in 64.9% and light perception was noted in 14.9% of patients.

Intraocular pressure (IOP)

Table 4: Distribution of children according to intraocular pressure.

PIO OD/OG (mmHg)	Number (%)
8	3 (15.8)
10	2 (10.5)
11	1 (5.3)
12	2 (10.5)
13	5 (26.3)
15	3 (15.8)
16	2 (10.5)
21	1 (5.3)
Total	19 (100,0)

Intraocular pressure ranged from 8 to 21 mmHg, with a mean of 12.7 ± 3.3 mmHg. Other values were scattered across the entire range of reported values.

Diagnosis and laterality

Table 5: Observed diagnoses.

Diagnosis	Effective	%
Lacrimal duct obstruction + Lacrimal conjunctivitis	60	81.1
Lacrimal duct obstruction + chronic dacryocystitis	4	5.4
Lacrimal duct obstruction alone	10	13.5

Eighty-one point one percent of patients presented with lacrimal duct obstruction associated with lacrimal conjunctivitis. Obstruction alone was noted in 13.5%, and chronic dacryocystitis secondary to lacrimal duct obstruction accounted for 5.4%.

Unilateral involvement was observed with an equal distribution between the right and left eyes, each representing 40.5% of cases. Bilateral involvement represented 18.9%.

Treatment and evolution

Table 6: Distribution of patients according to treatment.

Treatment	Effective	Percentage
Antiseptic	31	41.9
Antibiotic	69	93.2
Lacrimal sac massage	70	94.6

Lacrimal sac massage was performed in 70 patients (94.6%). Antibiotic eye drops and antiseptics were also administered. Four patients received systemic antibiotic therapy for chronic dacryocystitis. Regarding the outcome, 47 out of 52 patients (90.3%) experienced resolution after medical treatment, and 9 out of 22 patients (40.9%) required catheterization. Four cases of dacryocystitis, including one fistula, were observed (5.4%).

Discussion

Hospital Frequency

Congenital occlusion of the excretory lacrimal ducts (CELD) is among the most common ophthalmological conditions in infants. In this study, CELD was observed in 74 of 1118 children examined, representing a hospital incidence of 6.6%. This incidence is close to that reported by Paul and Shepherd, who found a rate of 6% in their study conducted in San Francisco [6]. However, it remains

lower than that reported by Sathiamoorthi et al. in Minnesota, who found a rate of 11.1% [7].

The differences in frequency observed between studies can be explained by several factors, including the methodological characteristics of the studies, the diagnostic criteria used, the demographic and geographic characteristics of the populations studied, and also access to pediatric ophthalmological care. Indeed, the hospital frequency does not necessarily reflect the true prevalence of oculomotor edema in the general population, as some children with mild symptoms may not be brought in for consultation. Furthermore, differences in the organization of healthcare services and in the use of specialized facilities can also influence the reported frequencies.

Age at first consultation

In our series, the age at first consultation ranged from 0.5 to 48 months, with a mean of 10.1 ± 10.7 months. The majority of patients, 43 children (58.1%), were between 0 and 6 months old. This predominance of very young infants is consistent with the natural history of occlusive tearing syndrome (OTS), which generally manifests early with persistent tearing and ocular discharge.

In a study conducted in Lubumbashi on dacryocystitis by Ngoie et al., infants represented 81.3% of patients. These cases of dacryocystitis were notably linked to imperforate lacrimal ducts [8]. This observation underscores the importance of occlusive lacrimal duct obstruction (OCVLE) in the occurrence of infectious manifestations of the lacrimal ducts in infants. In our study, the mean age of 10.1 ± 10.7 months was higher than that reported by the Pediatric Eye Disease Investigator Group (PEDIG), which found a mean age of 7.8 months [9].

The predominance of consultations during the first months of life could be explained by the early appearance of visible and bothersome clinical signs, particularly tearing and discharge. Parental anxiety also appears to be a significant factor in seeking care. However, the presence of patients consulting after the age of one year indicates that some cases persist beyond the usual period of spontaneous resolution and may require specialized management.

Sex and weight of patients

The sex distribution showed a female predominance in our series, with 39 girls (52.7%) versus 35 boys (47.3%), for a sex ratio of 0.9. This difference remains small and does not appear to reflect a true sex-related predominance. These results are consistent with data from the literature, which generally report a relatively homogeneous distribution of OCVLE between boys and girls [10,11]. Thus, sex does not appear to be a risk factor in the occurrence of this condition. The slight female predominance observed in this study could therefore be related to the specific characteristics of our sample rather than to a real increased susceptibility of the female sex.

The weight of the children included in this study ranged from 3.7 to 15 kg, with a mean of 7.9 ± 2.7 kg. This dispersion is related to the wide age range of the patients, which ranged from a few weeks to 48 months. The observed values were generally consistent with the age ranges represented in this population. One study reports that the majority of children diagnosed with congenital lacrimal duct obstruction (CLODO) have normal anthropometric parameters for their age [7]. In this series, weight cannot be considered a factor associated with the occurrence or persistence of CLODO.

Symptoms

Tearing was the main symptom observed in this study, present in 66 patients (89.2%). It was closely followed by purulent discharge, observed in 65 patients (87.8%). Other manifestations were much less frequent, including itching (20.3%), eyelid edema (8.1%), ocular redness (6.8%), and nasal swelling (4.1%). The predominance of tearing and ocular discharge is particularly suggestive of occlusive tear obstruction (OCVLE). Tearing results from obstruction of normal tear drainage, while tear stasis promotes the accumulation of mucus and debris in the lacrimal sac, explaining the high frequency of mucopurulent discharge. These two signs thus constituted important clinical indicators and are often the reason parents seek medical advice. Our results are close to those reported by the Pediatric Eye Disease Investigator Group (PEDIG), which found tearing in approximately 90% of cases and purulent discharge in approximately 80% of children [9]. This concordance reinforces the clinical value of these two symptoms in identifying occlusive laryngeal hernia (OLL) in infants.

Visual Acuity

Good visual acuity was observed in the majority of children in this series, with a value of 20/20 (10/10) found in 64.9% of patients. Light perception was noted in 14.9% of patients, while visual acuity was not determined in 8.1%. In infants and young children, however, assessing visual acuity remains difficult and depends on the child's age, cooperation, and the method used. The light perception values observed in this series should therefore be interpreted with caution, as they were attributed to the youngest patients. According to the literature, occlusive vision loss (OCVLE) is considered a condition without impact on developmental visual acuity in general [12]. However, it is considered among the amblyogenic factors, and its frequency increases with age [13].

Intraocular pressure

Intraocular pressure (IOP) ranged from 8 to 21 mmHg in this study, with a mean of 12.7 ± 3.3 mmHg. These values were generally consistent with expected values in infants and young children. IOP measurement is particularly important in children presenting with persistent tearing, as it helps rule out other potentially serious causes, including congenital glaucoma. A pediatric review confirmed that normal IOP in children is generally below 20 mmHg, although variations can occur, particularly depending on the measurement technique used [14]. IOP measurement is considered an important component of a complete ophthalmological examination.

Diagnosis and Laterality

In this study, the most frequent diagnosis was lacrimal duct obstruction associated with lacrimal conjunctivitis, observed in 60 patients, or 81.1% of cases. Isolated obstruction accounted for 13.5% of cases, while the association with chronic dacryocystitis was found in 5.4% of patients. The high frequency of the association between obstruction and lacrimal conjunctivitis is comparable to that reported by Zheng, who found this association in 87.5% of cases [15]. This significant proportion can be explained by tear stasis secondary to the obstruction. Indeed, the accumulation of secretions in the obstructed lacrimal ducts creates a favorable environment for microbial proliferation and local inflammation, which can manifest clinically as mucopurulent discharge and conjunctival inflammation.

Chronic dacryocystitis was less frequent in our series. Its occurrence generally reflects a more prolonged course of the obstruction, with persistent stasis in the lacrimal sac. It warrants particular attention, as the infection can exceptionally progress to local complications, notably fistulization or cellulitis.

Unilateral involvement was predominant in this series, affecting 60 patients (81.0%), with a strictly equal distribution between the right and left eyes. Bilateral involvement was present in 14 patients (18.9%). This predominance of the unilateral form is also reported in several clinical cohorts, in which bilateral involvement appears less frequent [16]. The observed balance between right and left eye involvement also suggests the absence of any particular lateral predilection in this population. Bilateral involvement, although less common, remains a classic presentation of central lacrimal occlusion (CLO) and justifies a systematic evaluation of both lacrimal ducts, even when symptoms appear to predominate on only one side.

Treatment

Lacrimal sac massage was the main conservative treatment used in this series, affecting 70 patients (94.6%). Topical antibiotics were administered to 69 patients (93.2%), while antiseptics were used in 31 patients (41.9%). The four patients with chronic dacryocystitis also received systemic antibiotic therapy. The high frequency of lacrimal sac massage in this series is explained by its central role in the initial treatment of occlusive tear obstruction. Conservative treatment, based primarily on Crigler massage combined with eyelid hygiene and, when indicated, eye drops, has variable success rates, ranging from 14.2% to 96% depending on the child's age and treatment adherence [17]. This significant variability underscores that the effectiveness of conservative treatment depends on several factors, including the age at the time of intervention, the degree of obstruction, and the regularity of massage. Its importance is particularly pronounced during the first few months of life, a period during which spontaneous resolution of the obstruction remains common. Therefore, educating parents on the correct technique for performing massage is an essential component of treatment.

Evolution after treatment

Regarding the outcome, 47 of the 52 patients who received medical treatment experienced resolution of the obstruction, representing a success rate of 90.3%. This result demonstrates the significant effectiveness of conservative management in our population. It is also consistent with the favorable natural course of occlusive bowel obstruction (OBO) in infants. Indeed, several studies have shown that progressive clinical improvement can occur spontaneously during the first months of life. In the absence of aggressive intervention, up to 90% of cases can resolve favorably before the age of one year, particularly when massage is performed correctly and continued regularly [11,18]. Thus, our results support the value of an initially conservative approach in infants with OBO, before considering an invasive procedure in patients with persistent obstruction.

In this series, 9 out of 22 patients underwent catheterization and experienced a favorable outcome, representing 40.9%. However, this rate must be interpreted in light of the fact that catheterization was performed on patients in whom the obstruction persisted despite medical treatment or presented characteristics warranting intervention. Patients undergoing catheterization therefore constitute a clinically distinct subgroup from those treated solely with conservative methods, thus precluding a direct comparison of success rates between the two approaches.

Complications

Complications were observed in four patients, representing 5.4% of cases. These consisted of chronic dacryocystitis, one of which was complicated by fistulization. Although infrequent, these complications illustrate the importance of early diagnosis and appropriate management of occlusive tear obstruction (OTO). Persistent obstruction leads to prolonged stasis of tears and secretions in the lacrimal system, which can promote infection and inflammation of the lacrimal sac. In advanced cases, infection can lead to local complications such as abscess formation or, more rarely, fistulization. In the literature, complications of OTO remain generally infrequent, representing less than 10% of cases [11]. The 5.4% proportion observed in our series is therefore within the range reported in the literature. However, the presence of a fistula in one of the patients serves as a reminder that, despite its generally benign and spontaneously resolving nature, occlusive duct obstruction (ODO) should not be systematically treated. Appropriate clinical monitoring allows for the identification of persistent or complicated forms requiring specialized care.

Conclusion

This study demonstrates that congenital occlusion of the excretory lacrimal ducts (CELD) is a relatively common condition in children in Lubumbashi, with the majority of parents seeking medical advice before the age of 7 months. CELD manifests primarily as excessive tearing with purulent secretions, and the prognosis is good with early and appropriate management. Lacrimal massage combined with antibiotic eye drops yielded satisfactory results in the majority of cases. Medical monitoring until the age of 12 months is necessary, and the cure rate after medical treatment remains high. The use of catheterization was very limited in our setting.

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