Scientific Research Publishing

Open Journal of Ophthalmology, 2025, 15(3), 147-154
https://www.scirp.org/journal/ojoph
ISSN Online: 2165-7416
ISSN Print: 2165-7408

Traumatic Cataract in Children at the Bartimée Clinic: Clinical and Therapeutic Particularities and Functional Outcomes

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How to cite this paper: Sovogui, M.D., Zoumanigui, C., Diop, M.S., Sylla, A. and Hann, F.T. (2025) Traumatic Cataract in Children at the Bartimée Clinic: Clinical and Therapeutic Particularities and Functional Outcomes. *Open Journal of Ophthalmology*, **15**, 147-154.
https://doi.org/10.4236/ojoph.2025.153019

Received: May 23, 2025
Accepted: August 23, 2025
Published: August 26, 2025

Abstract

Objective: To highlight the clinical, therapeutic and functional characteristics of traumatic cataracts in children. **Methodology:** This is a 4-year retrospective study. The files of patients aged 0 to 15 years who had undergone surgery for traumatic cataracts were included. Incomplete files and those who were followed up postoperatively but operated on elsewhere were excluded. Epi-info 7.4.0 was used for data analysis. The Birmingham Eye Trauma Terminology was the classification used in this study. **Results:** Specifically, we had collected 75 cases of traumatic cataracts among 130 operated patients aged 0 to 15 years, *i.e.* 57.7%. Average age 7.3 years ± 4.6; sex ratio: 1.67. The children were in school in almost all cases, *i.e.* 85.3%. The consultation period > 3 months was more represented 60.0%. Gambling accidents were the most frequent of the circumstances of occurrence 36.0%; Falls and shocks against objects were the most frequent etiological agent (60.0%). Contusive lesions predominated, as well as total white cataracts, respectively 57.3% each. Phaco-emulsification was the most practiced 74.7%. The children were implanted in a second phase after managing the emergency 68.0%. Corneal edema was the most common complication 48.0%. 100% was refracted after surgery. Visual acuity ≥ 3/10 was dominant postoperatively, 58.7%. **Conclusion:** Traumatic cataracts in children are a real eye health problem, as they are the most common traumatic cataracts. However, the implementation of precautionary measures, specialized and early management could improve these results.

Keywords

Traumatic Cataract, Child, Bartimaeus, Guinea

1. Introduction

Traumatic cataracts are an acquired, partial or total clouding of the lens following trauma. It frequently occurs in children and is mostly unilateral [1] [2]. In the literature, the etiologies are very varied, with different mechanisms depending on the traumatic context. However, in the United States of America, according to Zhu AY *et al.* [3], Traumatic cataracts were most often the result of open-globe trauma (87.5%) than closed-globe eye trauma (12.5%). In Yaoundé, Cameroon, Ebana Mvogo SR *et al.* [4], reported in 2018 a case of traumatic cataract by caning in a school setting. Dembélé A *et al.* [5], reported in 2015 in Mali Bamako, 35 cases of post-traumatic cataracts in children; Trauma was due to a braid needle in the majority (20%) of cases with a mean age of 8.4 years and a sex ratio of 1. In Guinea Conakry, Sovogui MD *et al.* [6], report 59.68% of traumatic cataracts in children aged 0 to 15 years. Thus, the high frequency of traumatic cataracts in children with the difficulties of care motivated the realization of this study. The aim of this study was to highlight the clinical, therapeutic and postoperative functional outcomes of traumatic cataract in children.

2. Methodology

2.1. Study Design

Traumatic cataracts are relatively common at the Bartimée Clinic, with difficulties in management and uncertain functional results. However, it has not been the subject of any scientific publication to date, thus motivating the carrying out of the said study. This is a retrospective, descriptive study with a duration of 4 years from June 1, 2020 to May 31, 2024. It took place in the Bartimée Ophthalmological Clinic, which is a second-degree hospital and specialized in ophthalmology. It is located in the Nongo district, sector I, commune of Ratoma, Conakry.

2.2. Study Participants

The study focused on the records of all children operated on and followed postoperatively during the study period, including traumatic cataracts. The files of patients aged 0 to 15 years, operated on for traumatic cataracts and followed at the Bartimée Clinic during the study period, were included. Excluded from this study were all children whose records were incomplete and those followed postoperatively whose procedure was not performed at the Bartimée Clinic. The variables studied were epidemiological, clinical, paraclinical, therapeutic and evolving.

2.3. Sampling

We had carried out an exhaustive recruitment of the applications, according to the selection criteria.

2.4. Data Collection Instrument

Questions related to sociodemographic characteristics, clinical variables and ther-

apeutic variables were collected from patients' medical records, via an individual questionnaire. Our data sources were the operating room registry and patient medical records.

2.5. Data Analysis

The data was processed and analyzed by Epi-info version 7.4.0, entered using Word and Excel from the office 2016 pack. The Birmingham Eye Trauma Terminology (BETT) which allows for a simple, unambiguous, consistent, detailed and comprehensive description and classification for all types of mechanical traumatic injuries of the eyeball, was used in this study. Zotero in its version 5.0.96.2 was used for bibliographic references.

2.6. Ethical and Regulatory Aspects

The study protocol was approved by the scientific committee of the Faculty of Health Sciences and Technology of the Gamal Abdel Nasser University in Conakry. We ensured the confidentiality of the data, and the free and informed consent of the participants was obtained before any inclusion.

3. Results

Specifically, we had collected 75 cases of traumatic cataracts among 130 operated patients aged 0 to 15 years, *i.e.* 57.7% frequency. (See Figure 1)

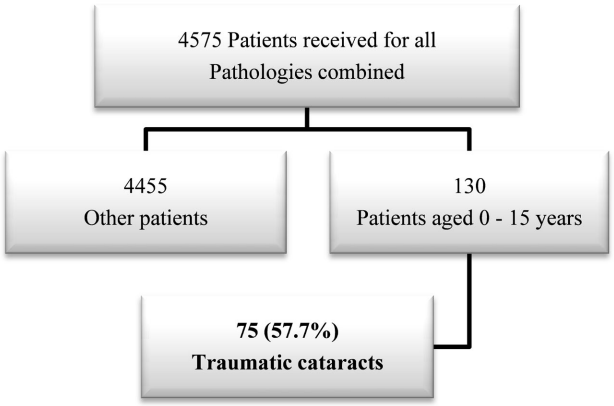

Figure 1. Frequency of traumatic cataracts in children aged 0 - 15 years at the Bartimée clinic.

In Table 1, the most represented age group is 0 to 5 years, followed by 6 to 10 years, the male sex was the most represented in more than half of the cases, and children were in school in almost all cases. The consultation period of more than 3 months was more represented, gambling accidents and accidents in schools were the most frequent of circumstances of occurrence, falls and impact against objects were the most frequent etiological agent; contusive lesions predominated the types of lesions encountered and white total cataract was the most common type.

Table 1. Sociodemographic and clinical data.

Variables	Effective	Percentage
Age in year		
0 - 5	31	41.3
6 - 10	24	32.0
11 - 15	20	26.7
Sex		
Masculine	47	62.7
Feminine	28	37.3
Schooling		
School	64	85.3
Not in school	11	14.7
Origin		
Conakry	58	77.3
Interior of the country	17	22.7
Consultation period		
≤1 month	13	17.3
1 - 3 month	17	22.7
>3 month	45	60.0
Circumstances of occurrence		
Gambling accidents	27	36.0
Accident in a school environment	24	32.0
Road accident	10	13.3
Domestic accident	7	9.3
Brawls	5	6.7
Caning	2	2.7
Etiological agent		
Fall/Bump Against Object	45	60.0
Punch	15	20.0
Foreign body	9	12.0
Chemical Burn	5	6.7
Thermal burn	1	1.3
Reach		
Contusive Injuries	43	57.3
Wounds	20	26.7
Foreign Bodies	8	10.7
Burns	4	5.3
Type of cataract		
Total white	43	57.3
Cortical	14	18.7
Posterior subcapsular corticosteroid	10	13.3
Cortico-nuclear	5	6.7
Posterior subcapsular	3	4.0

Average age: 7.3 years ± 4.6; Extremes: 2 years and 15 years; sex ratio: 1.67.

The BETT classification (Table 2) shows a predominance of closed globe lesions.

Table 2. Distribution of cases according to the BETT classification.

Type of injury		Effective	Percentage
Closed globe	Contusion	43	57.3
	Lamellar laceration	15	20.0
	Superficial foreign body	6	8.0
Open globe	Penetrating laceration	5	6.7
	Intraocular foreign body	2	2.7
	Eyeball Rupture	0	0.00

According to Table 3, the most used surgical technique was phacoemulsification in more than half of the cases. In the majority of children, the implants were performed in a second stage after managing the emergency. The most common complication was corneal edema.

Table 3. Variables related to surgery.

Variable	Effective	Percentage
Surgical technique		
Phacoemulsification	56	74.7
Manual Small Incision Cataract Surgery	19	25.3
Implementation time		
Second-stage implantation	51	68.0
Immediate implantation	24	32.0
Complications encountered		
Corneal edema	36	48.0
Mass Remainder	6	8.0
Posterior capsule rupture	6	8.0
From the vitreous	2	2.7

The implant calculation formula used was: IOL = A − 2.5LA − 0.9K + C.

The type of lens used was the monofocal lens.

All operated patients were refracted after the procedure.

In Table 4, we observe an improvement in visual acuity in subjects after traumatic cataract surgery.

Table 4. Comparison of preoperative and postoperative visual acuities.

Visual acuity	Preoperative	Postoperative
<1/10	40 (53.3%)	11 (14.7%)
1 - 2/10	19 (25.3%)	20 (26.7%)
≥3/10	16 (21.3%)	44 (58.7%)

4. Discussions

This study shows us that traumatic cataract in children accounts for a significant proportion of all traumatic cataracts, play accidents and school accidents were the most frequent circumstances of occurrence, falls and impacts against objects were the most frequent etiological agents and closed globe lesions, particularly contusive, predominated the types of lesions encountered, classified according to the BETT. The most used surgical technique was phacoemulsification in more than half of the cases. In the majority of children, implants were performed in a second stage after managing the emergency. The most common complication was corneal edema. A clear improvement in visual acuity was also noted after cataract surgery in the majority of cases. The strength of this study is that the study population is representative, as our patients come from all over the world and because of the exhaustive nature of the recruitment. However, it has a limitation, the fact of being retrospective. This is likely to occur in selection bias, or the presence of missing data during collection, which also explains the insufficiency of data on postoperative visual acuity.

Compared to sociodemographic characteristics, Saa KB *et al*. [7] in Togo reported a different proportion concerning the frequency of traumatic cataract in children (18.32%); but a similar sex ratio (2.54). Takou Tsapmene V *et al*. [8] report a frequency of 27.6%. Dembélé A *et al*. [5] found the 6 - 10 age group to be the most dominant in their sample, different from that found in this study. Regarding clinical data, the results found in this study are superimposable to those found by Diomandé IA *et al*. [9] in Ivory Coast who reported that the consultation period was dominated by that between 1 month and 1 year and that the most incriminated etiological agent was shock against object (plant body), *i.e.* 44%. Dembélé A *et al*. [5] reported gaming accidents as the most common circumstance of occurrence. Regarding the type of trauma according to the BETT, our results are different from those of Zhu AY *et al*. [3] who found that traumatic cataracts most often resulted from open globe trauma, *i.e.* 87.5%. For the anatomo-clinical type of traumatic cataract found, Kharbouch H *et al*. [10] report different proportions from those found in this study (ruptured cataract in 44.6% and total cataract in 14.3%). These different differences between the studies could be explained by the conditions in which each study was carried out but also by the study population. The most commonly used surgical technique was phacoemulsification. More than half of the children were implanted later and all those operated on were refracted. Saa KB *et al*. [7] report in their study that the extracapsular extraction technique with posterior chamber implant was performed in 80% of cases, that all patients benefited from delayed surgery and were refracted after surgery. Corneal edema was the most common postoperative complication in the short term; Kharbouch H *et al*. [10] reported 21.4% secondary cataracts and 14.3% inflammatory reactions as the complications encountered in their study. A clear improvement was observed in this study after cataract surgery. This finding is identical in the study by Saa KB *et al*. [7] in Togo who found that uncorrected visual acuity was greater

than 3/10 in 55% of cases at two months.

Strengths and Limitations

The strength of this study is that the study population is representative, because our patients come to us from all over the world and because of the exhaustive nature of the recruitment. However, it has a limitation, the fact that it is retrospective.

5. Conclusion

Traumatic cataract in children is a real eye health problem, as it is the most common traumatic cataract. It occurs most often in males, and is mainly caused by play accidents. It is often a complicated cataract, associated with other eye lesions that can compromise the functional prognosis. Its management is exclusively surgical, often accompanied by intraoperative complications. However, the implementation of precautionary measures through rigorous supervision of children and the rigorous use of protective equipment during dangerous games and games at risk of occurring accidents, as well as early treatment in a specialized environment, could reduce this frequency and improve visual functional results.

Conflicts of Interest

The authors do not declare any conflicts of interest in relation to this work.

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