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Case Report

When Orbital Trauma Hides a Malignant Tumour in Children

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Abstract

Introduction: Cancer pathology in children is rare with about 1,700 cases diagnosed in France per year. Although more than 80% of patients are now survivors at 5 years of age, cancers remain the leading cause of fatal illness between the ages of 1 and 15, making its diagnosis difficult at times unknown to the atypia of reported symptoms and even more masked by the notion of eye trauma.

Patients and Methods: 20We present the observation of four children with malignant pathology revealed by oculo-orbital manifestations. The first 12-year-old male child looking for a decrease in visual acuity of the right eye discovered incidentally during a contusive trauma of the left eye revealing a craniopharyngioma. The second 4-year-old female child admitted to the right painful red eye emergency room with trauma 20 days ago and a hyphmytotal revealing retinoblastoma. The third 5-year-old female child admitted to the emergency room for the onset of rapidly progressive left palpebral swelling in a traumatic context for a month revealing T-phenoma lymphoblastic lymphoma. the fourth patient is 3-year-old male referred for intravitreal hemorrhage of the left eye following trauma, revealing a retinoblastoma.

Discussion: The child's clinical examination must be complete bilateral and symmetrical, faced with the notion of trauma that is sometimes repetitive in cases of persistence or aggravation or even in the face of a simple doubt about the atypical nature of the eye injuries found in relation to the benign nature of the trauma, the ophthalmologist must remain vigilant and suspect an underlying pathology in the face of the slightest suspicion of cancer in order to carry out a clinical and paraclinical diagnostic approach confirming or affirming the diagnosis and sent the child for a multidisciplinary specialized paediatric cancer unit..

Keywords: Orbital Trauma; Ophthalmology; Cancer

Introduction

The child's eye injuries are a common reason for consultation in the ophthalmology emergency room and are a significant cause of blindness in the child. They are very serious in Africa because of the septic risk and the delay in specialized care. Most of them are preventable [1]. And their consequences mortgage each year the academic and subsequently professional future of these future adults.

Tumor pathologies in children are rarer but potentially serious, compromising visual and vital prognosis [2].

Vision problems are relatively common in children. In fact, clinical screening is an integral part of his periodic medical examination [3].

The lack of a national mandatory screening program for children's vision disorders in our context, and given the rarity of these

cancers and the non-specificity of symptoms exposes to many diagnostic pitfalls, so eye injuries remain a new opportunity to monitor an eye or general pathology that can lead to the visual or vital prognosis of the child.

The goal of our work is to present a series of cases of malignant tumors revealed by orbital trauma in children

Clinical Cases

1st observation

A 12-year-old male child with no particular pathological history, received in the emergency room two months after a bruising eye injury to the right eye resulting in significant palpebral edema preventing the opening of the eyeball. The interrogation reveals headaches for 4 months before the trauma without vomiting or other signs. The ophthalmological examination noted a corrected visual acuity of the affected hand-moving eye. Automatic refraction after cycloplegia had physiological values of -0.25 (-0.50 to 15 degrees). The anterior segment was und peculiarities with a photo motor reflex showing a relative pupil deficit. The ophthalmological examination of the adelpheus eye noted a corrected Av at 10/10 with automatic refraction at -0.50 (-0.50 to 165 degrees), an anterior segment and a normal direct and consensual photo motor reflex, the eye tone was 12 mmHg in both eyes. Examination of the back of the eye noted a bilateral papillary pallor. The visual field was difficult to achieve given the age. An optical coherence tomography (OCT) was performed showing a significant loss of retinal nerve fibers (RNFL). In front of this clinical and paraclinical picture, brain imaging was urgently requested to highlight a large, locally extended saddler and suprasellar process, responsible for the onset of falcoriel engagement and mass effect on the brainstem (Figure 1 and 2). The patient was referred to neurosurgical emergencies where he had benefited from incomplete exegesis of the tumor and ventriculo-peritoneal bypass. The anatomo-pathological study of the piece concluded to an adalantinome type craniopharyngioma, WHO grade I.

2nd observation

Female child, 4 years old with no particular pathological history, admitted to the emergency room for a redness of the right eye.

Figure 1: Cranio-orbital MRI in axial cut, weighted sequence T2 showing a voluminous sellar and suprasellar process with local extension, responsible for a mass effect and compressing the optical chiasma.

Figure 2: Craniobital MRI in sagittal cut, weighted sequence T1 showing a voluminous sellar and suprasellar process with local extension, responsible for a mass effect and compressing the optical chiasma.

The interrogation revealed a notion of eye trauma 20 days before, in circumstances unknown to the parents. Ophthalmological examination of the affected eye had shown conjunctiva hyperhemia, an edématicular cornea with an onset of hematoma and stage IV hyphema of the anterior chamber, lenslin and posterior pole not seen, and a decreased eye tone at bi digital palper. The ophthalmological examination of the control eye (OG) was uncharted. Eye ultrasound revealed an echogenic tissue mass at the posterior pole of some hyperechogenic spots generating posterior shadow cones in relation to calcifications, vascularized to the color doppler reaching up to the posterior face of the lens (Figure 3). Cranio-orbital CT scans showed an appearance in favour of a retinoblastoma of OD invading the proximal part of the optic nerve (Figure 4). The tumor was classified group E according to the Murphree classification. The patient had received two preoperative reduction chemotherapy treatments. Diagnostic and therapeutic enucleation was performed followed by 4 chemotherapy treatments.

Figure 3: Ultrasound appearance showing an echogenic tissue mass at the posterior pole of some hyperechogenic spots generating posterior shadow cones in relation to calcifications, reaching up to the posterior side of the lens.

3rd observation

Female child, aged 5 years, with no particular pathological history, victim of a left orbital trauma one month before admission for a rapidly progressive onset of palpebral swelling. Initial

Figure 4: A spect of cranio-orbital TDM, axial cut in relation to a retinoblastoma of the right eye, invading the proximal part of the optic nerve.

ophthalmological examination of the affected eye objectified a 10/10th corrected visual acuity, edema of the upper eyelid with ptosis, non-reducible non-axile exophthalmia without inflammatory signs, and anisolatedlomotor limitation in elevation. The anterior and posterior segment as well as the eye tone were undying in both eyes. Cranio-orbital imaging was urgently requested objecting a mass of the nasal edge of the left orbit, intra and extra conical, of homogeneous density, enhanced after injection of contrast product, without enhancement in clod at arterial time, characteristic of the hemangioma measuring 30×19×10 mm. This formation comes into contact with the internal and upper right muscles and represses the eyeball, responsible for grade I exophthalmia, with an under-perosticated reaction of the medial part of the orbit roof and the papyracic blade. This radiologically evoked mass a rhabdomyosarcoma of the upper-internal angle of the left orbit (Figure 5). We performed a biopsy after agreement of a multidisciplinary consultation meeting that objectified in histological study supplemented by an immunohistochemical analysis an aspect compatible with a T-phenotype lymphoblastic lymphoma. Then the child was referred to the hematology-oncology department of our hospital for further care.

4th observation

3-year-old male child, referred to our 3rd level hospital for intra vitreous hemorrhage following a left orbital impact point trauma. The interrogation noted a second-degree inbreeding in the parents. Examination of the affected eye to the state of awakening showed visual acuity at 10/10. The anterior segment is normal. The eye background objectified a floating peripheral retinal membrane in

Figure 5: Cranio-orbital CT in coronal cut showing a left intra-orbital internal tissue massery intra and extra conical.

Figure 6: Ultrasound image showing left intra-vitreous echogenic formation.

the vitreous. The examination of the adelphe eye is without peculiarities. Eye ultrasound showed an aspect of echogenic formation (Figure 6) for which a general anesthesia examination was performed the next day and which marked a normal anterior segment at the level of the affected eye, anormal eye t onus, and at the back of the eye performed after dilation, a temporal tumor with a retinal detachment, and a massive vitreous swarm type ''CLOUD'' reminiscent of a retinoblastoma classified group D (Figure 7). The examination of the control al eye is without peculiarities. A blood and radiological check-up was carried out. The patient was treated by onco-pediatrics or began intravenous chemotherapy with Carboplatin, Etoposide and vincristine (Protcole CEV) with intravitalian injections of Melphalan.

Figure 7: Retinal iconography of the left eye taken by RETCAM during an ophthalmological examination under general anesthesia showing retinoblastoma with intra-vitreous hemorrhage.

Discussion

To date, no scientific studies with a series of cases with malignant pathologies revealed by orbital trauma in children have been published and this by questioning the search engines Google Scholar and PubMed.

The importance of screening for vision disorders in childhood is based on the finding that 5% to 10% of preschoolers will have problems that, if left untreated, may interfere with the proper development of their visual acuity [4].

The *American Academy of Ophthalmology* and the American Academy *of Pediatrics* recommend visual assessment from birth and then to all regular health supervision visits. The anatomy and function of the infant and child's eyes should be checked during consultations with a measure of visual acuity during the preschool period and when the patient or parent is concerned about it [5]. Infants with a known risk (retinopathy of preterm, Down syndrome, etc.) or with a significant family history (congenital glaucoma, congenital cataract, strabismus) should be referred for further assessment [5].

In a recent study published in 2019 conducted by sisters793 consecutive patients with RB (Retinoblastoma) cared for at the Zhongshan Ophthalmic Center in China, 12 eyes of 10 children (6 boys and 4 girls)had an isolated history of trauma prior to diagnosis, with an average interval of 4.7 weeks between trauma and RB treatment. In 5 cases (5 eyes), there was an initial diagnostic error type an organization (no.1) or intra-vitreous hemorrhage (no.4) as is the case with our patient. This team concluded that RB may occur in a child with a history of trauma in the affected or unaffected eye. More importantly, primary intraocular disease should not be clinically interpreted as a complication of trauma until the possibility of under lying NRB is ruled out. Eye and head injuries in children should always warn pediatricians of the possibility of an etiology of visual impairment. Ophthalmologists should exclude RB in all children under 5 years of age with unusual intraocular signs in the emergency department [6].

Donald., *et al.* showed through his clinical case of an eye trauma-masked retinoblastoma [7] that:

- Eye trauma is more likely to occur in a blind eye
- A congenital or primitive eye condition can be masked or interpreted by a complication of eye trauma.
- An eye pathology should be raised when the clinical history of the trauma does not explain the results found during the clinical examination, namely the precise signs of trauma.

One study showed that children who consulted early (Some were diagnosed even before the onset of symptomatology) had less severe retinoblastoma than those who consulted late and therefore a more favorable functional prognosis. This highlights the importance of parental knowledge of retinoblastoma to initiate screening as soon as possible after birth [8]. Eye trauma is a unique opportunity for ophthalmologists to detect these abnormalities and not focus solely on trauma.

Childhood cancers can be revealed by signs directly related to the tumour itself, visible or palpable (mass or infiltration of soft tissues, adenopathies, leukoocoria): further oriented explorations should be considered immediately. They can also be revealed by signs of compression of the surrounding organs (intracranial hypertension, neurological signs...) or by signs of metastatic invasion: vital emergencies must be recognized, requiring at the same time the management of urgent symptoms, explorations leading to the diagnosis and initiation of specific treatments. But the initial symptoms are often initially not suggestive and considered banal [9].

It is important to be attentive and vigilant in the face of any non-specific symptoms that persist or worsen by following up with a clinical examination and carrying out the necessary paraclinical explorations.

In a study of 95 children in tropical environments, lesions (calcifications) were found incidentally in 4.49% of traumatized children. Showing by this that the ultrasound allows a complete orbital lesion balance with good sensitivity and is always indicated when the back of the eye is inaccessible. It is the ultimate imagery of the eye in a sparsely equipped environment [10].

A tumour should be removed from hyphema in a child even if in post-traumatic, as is the case with our child.

The words made by children in the verbal age can be invented or incorrect. It should also be noted that parents are often absent during the accident, which can mislead the ophthalmologist.

A study has shown that parents' knowledge of malignant tumors in children helps with the ophthalmologist's orientation and allows favorable treatment outcomes [8].

Parents and primary health care workers should be made aware of the need to send any child with eye trauma or eye symptoms to an eye specialist [11]. And beyond trauma, all emergencies should always be directed to a specialized ward for children with the following eye problems:

- An eye (or both) of abnormally small or large size
- One eye (or both) protruding
- Red mark on the eyelid
- An eye (or both) with a white pupil or a patent abnormality

And in all cases, the discovery or suspicion of childhood cancer requires prompt contact with a specialized multidisciplinary pediatric cancer setting.

Conclusion

In a traumatic context in children, malignant pathology can often be confused with traumatic manifestations, especially since the majority of signs are in common.

In identifying particular situations of trauma revealing a malignant tumor, we highlight the difficulty of diagnosing by the large number of common signs which can lead the ophthalmologist to mislead, and therefore delay treatment.

The rarity and lack of awareness of this entity often compromises the functional prognosis and sometimes the potentially preventable life-threatening prognosis.

Through this work, we recall that ophthalmological examination must always be systematic, bilateral and comparative even in the face of a trauma considered benign, and that the ophthalmologist should take advantage of this opportunity to detect malignant pathologies in children, especially in the absence of a systematic screening programme.

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