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Clinical and Therapeutic Aspects of Pediatric Rhegmatogenous Retinal Detachment on Senegalese Black Population

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Abstract

Background: Rhegmatogenous retinal detachment in children is particular by its severity and challenging treatment. **Purpose**: To describe the clinical and therapeutic characteristics of pediatric rhegmatogenous retinal detachment. **Method**: We retrospectively included files of pediatric patients (aged 0 to 15 years), clinically diagnosed with rhematogenous retinal detachment (RRD) between January 2015 and June 2019. The ophthalmological examination was as complete as the age of the patients allowed and a pediatric examination was systematically performed in all children. The data has been processed with Excel 2016 software. **Results**: 16 eyes of 11 patients were included. The hospital frequency of RRD was 3.37%, with a sex ratio of 1.75 and a mean age of 11.9 years. The average consultation time was 2 months. Contusive eye trauma was reported in 31.25% and myopia in 18.75%. The visual acuity ranged from no light perception to 20/400. The RRD was total in 81.25% and retinal lesions were found in 43.75%, including 25% atrophic holes and tears with lattice degeneration, 12.5% temporal retinal dialysis and one giant tear. Stage B of Proliferative vitreoretinopathy was found in 18.75% and stage C in 56.25%. Scleral buckling was performed in 37.5% and 23G pars plana vitrectomy with silicone oil in 18.75%. The mean duration of follow-up was 24.6 months with anatomical success in 77.7% correlated with functional recovery in 55.5%. The RRD was persistent in one case and a recurrent RRD under silicone was observed in one eye. Two children underwent cataract surgery secondary to vitrectomy, and one case of ocular hypertonia under silicone was noted. **Conclusion**: Pediatric rhegmatogenous retinal detachment is a severe disease, with essentially traumatic etiology in older children. Delayed diagnosis is a factor in poor prognosis.

Keywords

Pediatric Rhegmatogenous Retinal Detachment, Trauma, Myopia

1. Introduction

Pediatric rhegmatogenous retinal detachments (RRD) account for 5% to 12% of all retinal detachments (RD) [1] [2]. They are severe in relation to anatomical, clinical and etiological particularities that make them different from those of adults. The distribution of etiologies shows a predominance of congenital abnormalities in early childhood, supplanted by trauma and degenerative abnormalities in older children [1]. Pediatric RRD are severe making their management a challenge with an impact in functional outcomes.

In literature, most published reports are small case series and technical advances in vitrectomy make it the primary surgical procedure.

In our study, we report the clinical aspects and the surgical outcomes of pediatric RRD.

2. Method

We retrospectively studied over a period of 53 months (January 2015-June 2019), RRD diagnosed with three-mirror glass or Schepens binocular helmet in patients aged up to 15 years at the ophthalmology center of Abass NDAO Hospital, which is retinal diseases reference center. Children with exsudative or tractional retinal detachment were not included. All patients were examined by at least two differentiated posterior practitioners. Ophthalmic findings included visual acuity, refractive status, extent of retinal detachment, macula status (off or on), type of breaks, and presence of proliferative vitreoretinopathy (PVR) were recorded. The types of surgery, postoperative anatomic and functional success were also noted. In addition to the eye examination, all children received a general examination by the pediatrician. All surgeries were performed by the same surgeon. Expanded silicone was used for scleral buckling and 23 G pars plana vitrectomy was performed with silicone oil. Therapeutic abstention was indicated on eyes with no light perception. All patients had a post-operative regular follow-up. The data had been processed with Excel 2016 software.

3. Results

We included 16 eyes from 11 patients. The RRD's hospital frequency was 3.37% across all pediatric visits. The sex ratio was 1.75 and the average age was 11.9 years. The mean time to visit was 2 months. Contusive eye trauma was reported in 31.25% of cases, myopia in 18.75% of the eyes with 2 cases of pathological myopia (**Table 1**). In 43.75% of cases, no predisposing factors were reported. Visual acuity ranged from no light perception to 20/400. 43.75% had no light

perception. All the children were phakic. The RRD was total in 81.25% of cases, and peripheral retinal lesions were found in 43.75%, including 25% atrophic holes and tears with lattice degeneration, 12.5% temporal retinal dialysis and one giant tear. Proliferative vitroretinopathy was classified as stage B in 18.75% and stage C in 56.25% (Table 2). Surgical management was performed within an average of 15 days in 56.25%. Scleral buckling was performed in 37.5%, and vitrectomy with silicone oil in 18.75% (Table 3). The mean duration of post-operative follow-up was 24.6 months with anatomical success in 77.7% correlated with functional recovery in 55.5%. The RRD was persistent in one eye, and recurrent under silicone in a other one. Two children underwent cataract surgery secondary to vitrectomy, and one case of ocular hypertonia under silicone was noted.

Table 1. Predisposing factors of RRD.

Predisposing factors	Trauma	Myopia	Underdetermined
Percentage (%)	31.25	18.75	43.75

Table 2. Clinical characteristic of RRD (n = 16).

Characteristics	Number (Percentage (%))
RRD	
Total	13 (81.25)
Partial	3 (18.75)
Macula	
Off	14 (87.5)
On	2 (12.5)
Lesions	
Atrophic holes with lattice degeneration	2 (12.5)
Tears with lattice degeneration	2 (12.5)
Dialysis	2 (12.5)
Giant tear	1 (6.25)
PVR	
B	3 (18.75)
C	9 (56.25)
>C	4 (25)

Table 3. Surgical outcomes.

Surgical outcomes	Number, (Percentage (%))
Type of surgery (n = 9)	
Scleral buckling	6 (37.5)
Pars plana vitrectomy	3 (18.75)

Continued

Results	
Retinal reattachment	7 (77.7)
Persistent RRD	1 (11.11)
Recurrent RRD	1 (11.11)
Functional recovery	5 (55.5)
Vitrectomy complications (n = 3)	
Cataract	2 (12.5)
Ocular hypertonia	1 (6.25)
Therapeutic abstention	7 (43.75)

4. Discussion

In our study, pediatric RRD's hospital frequency was 3.37% over 53 months, reflecting its rarity. Caputo [2] estimated it to be 5% - 12% of all RD. Male predominance is common and may be as high as 80% in some series [2] [3] [4] [5], relative to the frequency of the traumatic origin of pediatric RRD. The traumatic context is often unrecognized, but in our study it was reported in 31.25%, justified by the average age of our patients which was 11.9 years. In addition to trauma, myopia was the main risk factor. It was observed in 18.75% of the eyes, including 2 cases of high myopia. Trauma and myopia are recognized as the two main etiologies of pediatric RRD ranging from 26% to 35% for trauma and from 9% to 14% for pathological myopia [6] [7] [8]. In children, the compact and nondetached vitreous increase the risk of RD secondary to degenerative lesions caused by myopia [1]. Congenital abnormalities are also a specific etiology in children, they are reported in many studies [3] [4] [9] and are often responsible for bilateral RD. In our cases, no congenital abnormalities were observed even though bilateral RD was diagnosed in 5 children. Among the congenital pathologies, retinopathy of prematurity, Stickler syndrome and Marfan syndrome were reported more frequently in occidental studies, whereas in Asia familial exudative vitreoretinopathy appears to be the most common [9]. Intraocular surgery is also a significant risk factor, found in 61% of the study of Gonzales [3].

The average time to visit for our patients was 2 months, however, this does not reflect the duration of the RD, as children are not always aware of their decreased visual acuity. The particularly severe aspect of RRD in our context is also demonstrated by the high rate of children with no light perception (43.75%) and low initial visual acuity. This delayed diagnosis explains the high rate of total RD (81.25%) and stage C of PVR (56.25%), also found in most studies [3] [5] [9]. The lesions responsible for the RRD are not always identified because the ophthalmological examination is often limited in children. In our study, they were found only in 43.75%, dominated by atrophic holes and tears with lattice degeneration in 25%. This predominance is also reported by other authors [5] [9]. We also identified 12.5% of post-traumatic retinal dialysis. In the literature, the

percentage of retinal dialysis complicated by retinal detachment for which a history of ocular trauma is found was between 36.5% and 70% [2].

The proliferative vitreoretinopathy is particularly severe in children, explained by their high cellular activity, making the RRD complex and requiring early treatment. In our study, the average time for surgery was 15 days, which was reasonable.

Given the complexity of the retinal detachment in children, vitrectomy is often the initial surgical procedure. In our study, scleral buckling was the most performed surgery because most of the children requiring vitrectomy had no light perception so we recommended therapeutic abstention. Scleral buckling remains a valuable option, especially when the PVR does not exceed stage C [5] [9]. The compact and homogeneous vitreous in children makes it very attached to the retina and the lens, making its dissection more difficult [2] [5]. The vitrectomy would be reserved for RRD with severe PVR, macular hole, giant or posterior tear, epiretinal membrane or coloboma [10]. The difficult postoperative positioning and monitoring of gas in children make silicone oil the most accepted type of prolonged tamponade in vitrectomy. However, it has more complications, including cataracts and ocular hypertension. In our study, 2 children had cataracts after vitrectomy, and one case of ocular hypertonia was noted. In some cases, scleral indentation is combined with plana vitrectomy to reduce PVR-related peripheral traction [5] [11] [12].

Anatomical success was achieved in 77.7% after one surgery correlated with functional recovery in 55.5% of cases. The second surgery was performed in two eyes for persistence and recurrence of RRD. In the literature, retinal reattachment is ranged from 72% to 94% [13] [14] [15] and often required several surgeries. Discordance between anatomical and functional recovery in children is reported in all series [3] [4] [9] [10], the main factors being the duration of the RRD, the macula involved, the severe PVR and the frequent presence of congenital abnormalities.

5. Conclusion

Pediatric rhegmatogenous retinal detachment is characterized by its severity at first and a definite delay in diagnosis. The anatomical and functional prognosis is less favorable than in adults because of the high rate of proliferative vitreoretinopathy. The frequency of traumatic etiology should make retinal examination systematic by a specialized ophthalmologist after ocular trauma.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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