

## ***Paediatric Retinal Detachment, Is it a Real Clinical Challenge?***

---

### **Authors:**

Dr. Ayman Sami Madanat, FRCS, FRCOphth, DO.  
Head of Ophthalmology Dept.  
P. O. Box: 8141. .  
Amman 11121, Jordan.  
**Tel:** 077767494.  
**Fax:** NA.  
**E-mail:** [drayman2@hotmail.com](mailto:drayman2@hotmail.com)

Dr. Thabit Ali Abdullah Mustafa, FRCS (Glasg),  
Jophth  
Ophthalmology Dept. King Hussein Medical Center,  
Royal Medical Services, Amman, Jordan  
**Tel:** 077 417917.  
**Fax:** NA.

### **Correspondence:**

DR. Thabit Ali Abdallah Mustafa, FRCS (Glasg).  
P.O.Box: (2740).  
Irbid 21110, Jordan.  
**Tel:** 077 417 917.  
**Email:** [thabitodat@hotmail.com](mailto:thabitodat@hotmail.com)

---

### **ABSTRACT**

**Purpose:** To determine the aetiologies, clinical features, surgical and visual outcome of retinal detachments in 30 paediatric patients that were treated at our tertiary referral hospital.

**Method:** A retrospective analysis of 30 paediatric patients' charts (33 eyes) younger than 16 years of age who underwent surgical repair for retinal detachment consecutively between May 1998 and April 2004 at King Hussein medical hospital, was conducted. The following items were recorded: Age, sex, date of admission, family history of retinal detachment, history of trauma, diagnosis, pre-operative assessment of visual acuity, anterior segment, motility, and posterior segment, systemic associations and aetiology. The type of surgery was recorded. Follow up periods extended from A few months to 6.5 years with a mean of 1.95 years.

**Results:** Twenty-four (80%) of patients were males and 6 (20%) were females. The ages ranged from 5 months to 16 years with a mean age of 9.43 years. The right eye was involved in 18 (54.54%) cases, the left in 9 (27.3%) and both eyes in 3 (9.1%) cases. The commonest cause was trauma 45.5% followed by myopia 15.2%. Bilateral cases were seen in 3 patients. One had myopia (more than - 4 diopters) and 2 had Down syndrome. The most frequent procedures were pars-plana vitrectomy (PPV), intra-ocular gas (SF6), external band with or without internal drainage, and cryotherapy or laser. The visual acuity improvement was documented in 8 (24.2%)

cases, while in 6 (18.2%) cases it was the same, and in 5 (15.2%) cases it was worse or the eye was enucleated. Anatomical retinal reattachment was achieved in 25 (75.75%) cases.

**Conclusion:** In this series, paediatric retinal detachment was mainly due to trauma and was more frequent in males. Most of the cases were treated by pars-plana vitrectomy (PPV) and the final visual acuity was relatively poor which rprovides a real clinical challenge to retinal surgeons, who requires good outcomes and proper preparation. Prophylactic treatment of the fellow eye should be undertaken without delay in patients with a history of non-traumatic RD.

---

**Key words:** Paediatric retinal detachment, pars-plana vitrectomy, intra-ocular gas.

---

### **INTRODUCTION**

The paediatric patient presents many challenges to the vitreoretinal surgeon that require special consideration. Due to the difficulty of examining the signs as well as recognising the symptoms of retinal detachment in children, and because of the variety of the underlying diseases and rarity of patients (1&2), the timing of retinal detachment repair is often unavoidably delayed despite appropriate referral. As the paediatric patients are unable to verbalise their visual complaints most of the time, they are often referred for one of the following reasons: No red reflex, suspected retinal detachment, unexplained strabismus, leukocoria, history of trauma, a change in visual function, or unexplained irritability.

Rhegmatogenous retinal detachment is infrequent in the paediatric age group with an incidence of 1.7- 5.9% of all retinal detachments (2- 4), while traumatic retinal detachment is 2.5- 2.9 per 100,000 between the ages of 10 and 19 years (5&6), and 0.6 per 100,000 less than one year and 9 years (5).

We retrospectively reviewed the medical charts of paediatric patients younger than 18 years old who had undergone surgical treatment for retinal detachment at King Hussein medical centre.

### **MATERIALS & METHODS**

A retrospective analysis of 30 paediatric patients' charts (33 eyes) younger than 16 years of age who underwent surgical repair for retinal detachment consecutively between May 1998 and April 2004 at King Hussein medical centre, was conducted. The following items were recorded: Age, sex, date of admission, family history of retinal detachment, history of trauma,

diagnosis, pre-operative assessment of visual acuity, anterior segment, motility, and posterior segment, systemic associations and aetiology. We also recorded type of surgery, intra-ocular gas, intra-ocular silicone oil, intra-ocular heavy liquids, explants, drainage, complications including intra-operative and post-operative, results, and follow up periods. Follow up periods extended from a few months to 6.5 years with a mean of 1.95 years.

## RESULTS

A total of 33 eyes in 30 paediatric patients with retinal detachments were reviewed over 6.5 years.

Twenty-four (80%) patients were males and 6 (20%) were females. The ages ranged from 5 months to 16 years with a mean age of 9.43 years. The right eye was involved in 18 (54.54%) cases, the left in 9 (27.3%) and both eyes in 3 (9.1%) cases.

The aetiology of retinal detachments was as follows: Trauma was the commonest cause (45.5%) followed by myopia (15.2%). Perforating trauma was encountered in 9 cases (60% of trauma) and blunt trauma in 6 cases (40% of trauma). The majority of those patients were males (93.3% of trauma). Bilateral cases were seen in 3 patients one had myopia (more than - 4 diopters) and 2 with Down syndrome. Toxocara, Coat's disease, Retinopathy of prematurity, Persistent hyperplastic primary vitreous and Eals disease constituted 15% of all the cases.

The presenting clinical features were as follows: The majority of cases (46.7%) were referred as traumatic retinal detachment from primary or secondary care centers, visual loss 23.3%, leukocoria 10%, post-operative 10%, squint ± nystagmus 6.6 % and buphthalmos 3.3 %.

Table 1 summarises the surgical procedures that were performed for the patients. The most frequent procedures were pars-plana vitrectomy (PPV), intra-ocular gas (SF6), external band with or without internal drainage, and cryotherapy or laser. Systemic associations with the retinal detachment are shown in Table 2.

The majority of cases (70%) were not associated with any systemic anomalies.

Figure 1 compares the pre- and post- operative best corrected visual acuity. The visual acuity improvement was documented in 8 (24.2%) cases, while in 6 (18.2%) cases it was the same, and in 5 (15.2%) cases it was worse or the eye was enucleated. In 14 (42.4%) cases it was not documented in the files because of the difficulty in testing visual acuity, either because of young age or mental retardation. Figure 3 shows the final anatomical results where anatomical retinal reattachment was achieved in 25 (75.75%) cases.

## DISCUSSION

According to different reports (4, 7, 8), the incidence of paediatric retinal detachment is quite low. This may be due to difficulties in diagnosing such conditions, which usually require examination under general anaesthesia, and because of the variety of the underlying causes. The most common cause of paediatric retinal detachment in our study, was trauma, which accounts for 45.5%, and is consistent with the previous reports (3-4, 6-9). Males (93.3%) were affected more than females, comparable to previous studies (8, 9) and this may be due to engagement of boys in vision-threatening games. Myopia with refractive error more than - 4 diopters, was the second most common cause (15.2%) of paediatric retinal detachment and the clinical diagnosis of those patients was not recorded in the medical files. Rhegmatogenous retinal detachments in children are often found accompanying other vitreoretinal pathology or trauma and has been reported in cases of Marfan's syndrome, Stickler's syndrome, cataract extraction, and trauma (10- 12).

Retinal detachment is also a well-known complication of congenital cataract extraction. However, the interval between surgery and the development of retinal detachment is much longer in children (20 to 30 years) than in adults (50 percent occur within the first year after surgery) (13- 17). Retinal detachment after congenital cataract extraction was encountered in 15.2% and all of them were diagnosed as Down syndrome. The incidence of retinal detachment following surgery for congenital cataract is not well established.

One review in the literature reported incidences ranging from 2 to 8 percent and another reported incidences of 5 to 25 percent (18-19). Three patients (9.1%) had bilateral retinal detachment after cataract extraction, so it is important to remember that when dealing with retinal detachments following congenital cataract extraction, 70 percent of these patients will experience detachment in the fellow eye, and therefore they require careful follow-up (16). Less frequent causes were Toxocara, Coat's disease, retinopathy of prematurity (ROP), persistent hyperplastic primary vitreous (PHPV) and Eals' disease.

Most of the cases with retinal detachment had a history of old or recent trauma (46.7%), Sarrazin *et al* (9) found that more than half of cases with traumatic retinal detachment presented late, probably because of its late development. The late development of traumatic retinal detachment in children may be because of the tight adherence between the vitreous gel and the retina and the absence of vitreous liquefaction and posterior vitreous detachment (PVD) (9).

Pars-plana vitrectomy (PPV), intra-ocular gas (SF6), external band with or without internal drainage, and cryotherapy or laser was performed in about one third of patients and this was because most cases were due to

penetrating eye injuries, while external band with or without external drainage was done in 18.2% of cases, as this procedure is preferred for paediatric rhegmatogenous retinal detachment because the areas of PVD are usually localised in those patients, making vitrectomy more difficult (8).

Silicone oil was used in 18.2% of cases and this is of advantage as the child is able to move around freely; however all of the complications of silicone oil must also be taken in consideration, such as cataract, glaucoma, corneal decompensation, and reoperation for removal (20).

Children's level of physical activity and inability to position postoperatively make the consideration of a long-acting tamponade very appealing. This may free the child and caretaker from a rigorous positioning regimen. Although 70% of cases had no systemic associations with the retinal detachment, Down syndrome, brain damage, prematurity and epilepsy were

encountered in few patients.

While the visual acuity was not documented in most of the cases 42.4% either because of young age or mental retardation, about one quarter of them had a documented improvement of their vision, making the surgical treatment a justified option.

Overall, anatomical retinal reattachment was achieved in 75.75% cases in spite of lesser percentage of achieved visual improvement (24.2%). This disparity was due to other negative factors encountered in most of the cases like amblyopic squint due to late presentation, macular scar due to trauma, macular hole, postoperative complications like cataract or proliferative vitreous-retinopathy, or PHPV, so early diagnosis and treatment are of paramount importance before the development of any of the above mentioned complications, which presents a real challenge to the retinal surgeon.

**Table 1:** Retinal detachment procedures.

| <b>Procedure</b>   | <b>Number f eyes (%)</b> |
|--|--------------------------|
| PPV* + silicone oil ± internal drainage ± External band ± cryotherapy/ laser   | 6 (18.2)                 |
| PPV + Intra- ocular Gas + External band ± Internal drainage + cryotherapy/ laser   | 10 (30.3)                |
| External band ± external drainage 6 (18.2)<br>PPV + Lensectomy ± External band+ laser ± internal drainage ± Silicone oil | 8 (24.2)                 |
| PPV + Removal of IOFB**  | 1 (3)                    |
| Inoperable retinal deattachment  | 1 (3)                    |
| Lensectomy + Resection of retro- lental membrane   | 1 (3)                    |
| <b>Total</b>   | <b>33 (100)</b>          |

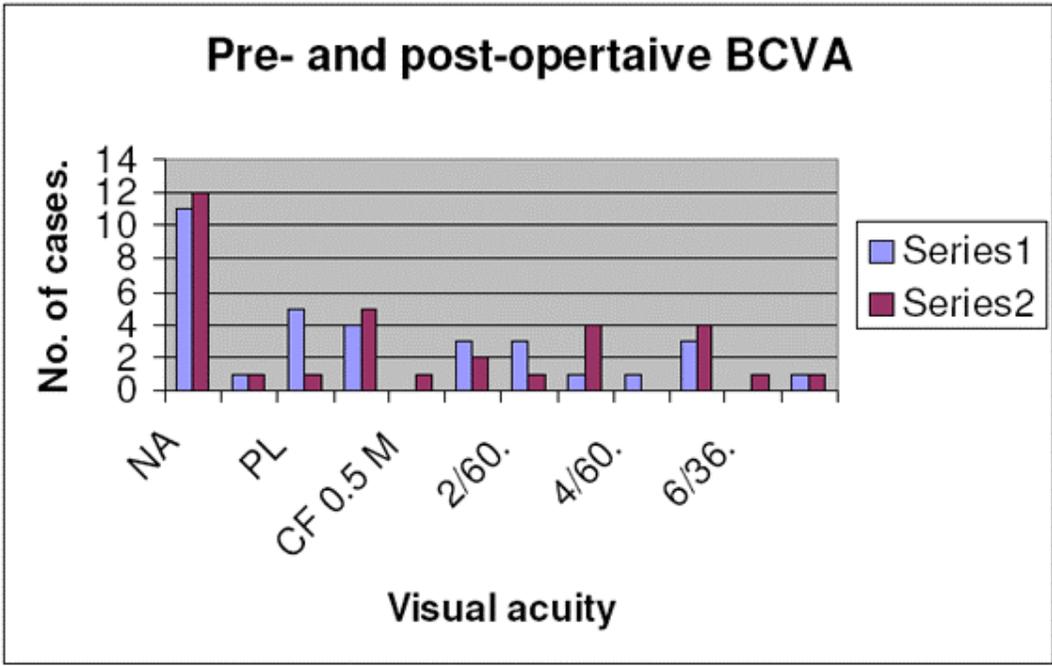
\*Pars- plana vitrectomy.

\*\*Intra- Ocular foreign body.

**Table 2:** Systemic associations with the retinal detachment.

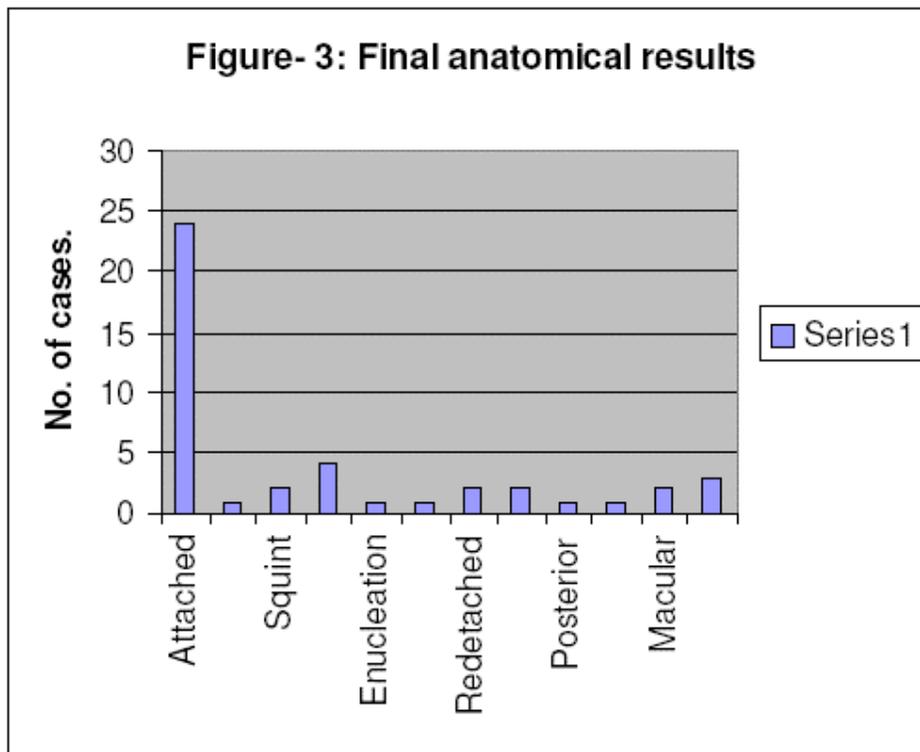
| <b>Systemic Association</b>    | <b>Number (%)</b> |
|--------------------------------|-------------------|
| No association                 | 21 (70)           |
| Short stature + psoriasis      | 1 (3.3)           |
| Epilepsy                       | 1 (3.3)           |
| Premature + Brain damage       | 3 (10)            |
| Down syndrome                  | 2 (6.6)           |
| Cleft palate                   | 1 (3.3)           |
| Severe handicap + spina bifida | 1 (3.3)           |
| <b>Total</b>                   | <b>30 (100)</b>   |

Figure- 1



Preoperative BCVA: Preoperative best corrected visual acuity.  
Postoperative BCVA: Postoperative best corrected visual acuity.  
NA: Not available in the records.  
PL Perception of light.  
HM: Hand movement.  
NPL: No perception of light.  
CF: Counting fingers.

Figure- 3



#### REFERENCES

1. Tassman W. Retinal detachment in children. *Trans Am Acad Ophthalmol Otolaryngol* 1967; **71**: 455–459.
2. Winslow R.L. and Tasman W., Juvenile rhegmatogenous retinal detachment. *Ophtha-Imology* 1978; **85**: 607–618.
3. Akabane N, Yamamoto S, Tsukahara I, Ishida M, Mitamura Y, Yamamoto T *et al*. Surgical Outcomes in Juvenile Retinal Detachment. *Jpn J Ophthalmol* 2001; **45**: 409- 411.
4. Butler TKH, Kiel AW, Orr GM. Anatomical and visual outcome of retinal detachment surgery in children. *Br J Ophthalmol* 2001; **85**: 1437-1439.
5. Haimann MH, Burton TC, Brown CK. Epidemiology of retinal detachment. *Arch Ophthalmol* 1982;100: 289 –292.
6. Rosner M, Treister G, Belkin M. Epidemiology of retinal detachment in childhood and adolescence. *J Pediatr Ophthalmol Strabismus* 1987; **24**: 42- 44.
7. Fivgas GD, Capone A Jr. Paediatric rhegmatogenous retinal detachment. *Retina*. 2001;21 (2):101-6.
8. Yokoyama T, Kato T, Minamoto A, Sugihara A, Kuwabara R, Mizote H *et al*. Characteristics and surgical outcomes of paediatric retinal detachment. *Eye* 2004; **18** (9): 889- 892.
9. Sarrazin L, Averbukh E, Halpert M, Hemo I, Rumelt S. Traumatic paediatric retinal detachment: A comparison between Open and closed globe injuries. *Am J Ophthalmol* 2004; **137**: 1042- 1049.
10. Greco GM, Ambrosina L: Treatment of retinal detachment in Marfan's syndrome. *Ann Ophthalmol* 1993; **25**(2): 72- 6.
11. Stickler GB, Belau PG, Farrell FJ *et al*: Hereditary progressive arthroophthalmopathy. *Mayo Clin Proc* 1965;40: 433- 8.
12. Cox MS: Retinal breaks caused by blunt nonpenetrating trauma at the point of impact. *Trans Am Ophthalmol Soc* 1980; **78**:414- 8.
13. Kanski JJ, Elkington AR, Daniel R: Retinal detachment after congenital cataract surgery. *Br J Ophthalmol* 1974; **58**:92- 7.
14. Taylor BC, Tasman WS: Retinal detachment following congenital cataract surgery. *Tex Med* 1974; **70**: 83- 6.
15. Toyofuku H, Hirose T, Schepens CL: Retinal detachment following congenital cataract surgery. *Arch Ophthalmol* 1980; **98**: 669- 73.
16. Jagger JD, Cooling RJ, Fison LG, *et al*: Management of retinal detachment following congenital cataract surgery. *Trans Ophthalmol Soc UK* 1983; **103**: 103- 6.
17. McLeod D: Congenital cataract surgery: A retinal surgeon's viewpoint. *Aust NE J Ophthalmol* 1986; **14**: 79- 81.
18. Francois J: Late results of congenital cataract surgery. *Ophthalmology* 1979; **86**: 1586- 90.
19. Ryan SJ, Blanton FM, von Noorden GK: Surgery of congenital cataract. *Am J Ophthalmol* 1965, **60**: 583- 7.
20. Ferrone PJ, McCuen WB, deJuan E, Machermer R: The efficacy of silicone oil for complicated retinal detachments in the paediatric population. *Arch Ophthalmol* 1994; **112**:773- 7.

