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## RESEARCH ARTICLE

### Does the Method of Delivery Influence the Recurrence of Rhegmatogenous Retinal Detachment?

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#### Abstract:

#### Purpose:

The aim of this study was to evaluate whether the method of delivery has an effect on the incidence rate of recurrent rhegmatogenous retinal detachment in women who have been previously treated surgically for rhegmatogenous retinal detachment.

#### Methods:

In this retrospective cohort study, data were collected from computerized files on Rabin Medical Center and Clalit Health Services databases, to create the study group: Women who were surgically treated due to rhegmatogenous retinal detachment and who had given birth after their ocular surgery. A primary list of women aged 18-43 who underwent Pars Plana Vitrectomy or Scleral Buckling between the years 2005-2018 was obtained from the Rabin Medical Center Surgical database. The study protocol was approved by the institutional Helsinki Committee at Rabin Medical Center (0417-18-RMC).

The main outcome compared was the incidence rate of recurrent rhegmatogenous retinal detachment following childbirth for every type of delivery; vaginal, assisted delivery, and cesarean section.

#### Results:

Fourteen women had given birth after their ocular surgery, and all underwent Scleral Buckling. Ten of the women had a normal vaginal delivery, 3 women underwent a cesarean section and one woman had a vacuum-assisted vaginal delivery. No case of recurrent retinal detachment was documented.

#### Conclusion:

We conclude from this study that the method of delivery does not have an influence on the recurrence of rhegmatogenous retinal detachment, thus vaginal delivery is not contraindicated in women with previously treated rhegmatogenous retinal detachment.

**Keywords:** Assisted delivery, Cesarean section, Childbirth recommendations, Eye, Loss of vision, Ophthalmology and labor, Ophthalmologist, Pregnancy, Retina, Vaginal delivery.

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## 1. INTRODUCTION

Rhegmatogenous retinal detachment (RRD), a term derived from the Greek “reghma” or fracture, is characterized by the presence of a full-thickness retinal break. This break is held open by vitreoretinal traction that allows the accumulation of liquefied vitreous into the potential space between the retinal pigment epithelium (RPE) and the neurosensory retina. The predisposing factors to Rhegmatogenous retinal detachment are

liquefied vitreous, traction forces that maintain a retinal break open, and a retinal break in which fluid can access the potential space between the RPE and sensory retina. The main Risk factors for RRD include high myopia, usually defined as greater than 6.00 D, existing retinal breaks or holes, and previous retinal detachment [1]. An area that has been sparsely studied is the effect of normal vaginal delivery on the retina with risk factors for RRD. In the past, physicians believed the Valsalva-like straining mechanism, such as labor, might cause serious intra-ocular pressure changes which would precipitate retinal tears or detachment in predisposed eyes [4]. It is well known today that intra-ocular pressure is not influenced by

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Valsalva maneuvers, and that retinal tears are created due to tractional forces from within the globe, such as those induced by rotation movements in areas in which the vitreous is attached to the retina firmly. When those forces are strong enough the retina tears, enabling liquid to penetrate the subretinal space. Another source of confusion regarding the occurrence of retinal detachment during labor is the type of detachment that occurs. Exudative retinal detachment is characterized by fluid accumulation in the subretinal space, with no retinal breaks or traction, it occurs when either retinal blood vessels leak or RPE is damaged allowing fluid to pass into the subretinal space.

The serous retinal detachment which is more frequent in pregnancy is not influenced by the method of delivery, usually resolves spontaneously after delivery, and has a good prognosis [1].

In 1985, a study by Neri *et al.* comprised 50 myopic women (4.5 to 15 D) examined by retina specialists pre- and post-delivery. Despite the identification of retinal degenerative changes including lattice-like degeneration in 17 eyes and retinal breaks in 11 eyes, along with myopia, no retinal changes were reported post-delivery [2].

In 1996, a study of a similar design, by Prost, reported no progression of retinal changes likewise [3].

A smaller study by Landau *et al.* in 1995 examined 10 women (19 deliveries) with variable retinal changes: 8 women had bilateral lattice changes, 8 eyes had tears large enough to require laser treatment or cryopexy, and 6 eyes had undergone repair of retinal detachment prior to the pregnancy. Again, the post-delivery follow-up examination of the retina failed to show any significant changes compared to the pre-delivery findings [4].

Based on these findings these authors concluded that normal delivery is not contraindicated in healthy pregnant females with RRD risk factors.

This literature in conjunction with the known pathophysiology of RRD led to the common approach among ophthalmologists that normal deliveries are not contraindicated in healthy pregnant females with a "high-risk retina" [5].

In contrast, many obstetricians still advocate cesarean section or assisted delivery (forceps/ vacuum delivery) for pregnant women with ocular abnormalities predisposing to RRD, rather than normal vaginal delivery [6 - 8].

This study's objective was to examine whether the method of delivery has an effect on the incidence rate of recurrent RRD in women who have been previously treated surgically for RRD.

## 2. METHODS

This retrospective cohort study investigated the effect of the method of delivery on the incidence rate of recurrent RRD. Data were collected from computerized files on Rabin Medical Center surgical database, "Camelion" Rabin Medical Center medical database, and "Ofek" Clallit Health Services database. The study protocol was approved by the institutional Helsinki Committee at Rabin Medical Center(0417-18-RMC). A

primary list of women aged 18-43 who underwent Pars Plana Vitrectomy or Scleral Buckling between the years 2005-2018 was obtained from the Rabin Medical Center Surgical database. Further data were collected from records on "Camelion" and "Ofek" to create the study group: women who were operated on due to rhegmatogenous retinal detachment and who had given birth after their ocular surgery.

Further inclusion criteria were: A single successful surgery followed by a full ophthalmologic examination documenting an attached retina prior to labor, a full ophthalmologic examination at least one year following labor, and full data regarding the method of labor and any complications. Surgical methods included Pars Plana vitrectomy or Scleral Buckling with/without gas/silicone oil exchange; with/without laser; or cryotherapy.

Exclusion criteria included: Prior ophthalmologic surgery other than refractive surgery, non-rhegmatogenous retinal detachment, *i.e.*, exudative or tractional, and ocular trauma. Other retinal comorbidities, more than one retinal detachment, and insufficient ophthalmologic follow-up prior to or following labor were excluded as well.

The final outcome examined was the incidence rate of recurrent RRD for every type of delivery.

## 3. RESULTS

A total of 102 women aged 18-43 underwent surgery due to rhegmatogenous retinal detachment in the years 2005-2018 at the Rabin Medical Center, Petah Tikva, Israel. After implementing inclusion and exclusion criteria the study group included 14 patients who had given birth after their ocular surgery. All 14 patients underwent Scleral Buckling. Ten of the women had a normal vaginal delivery, 3 women underwent a cesarean section and one woman had a vacuum-assisted vaginal delivery. No case of recurrent retinal detachment was documented.

## 4. DISCUSSION

Pregnant women with a history of previous retinal detachment are occasionally referred to an ophthalmologist for consultation regarding the management of pregnancy and labor.

Despite current evidence suggesting that normal deliveries are not contraindicated in healthy pregnant females with RRD risk factors [2 - 4], a common perception among obstetricians is that spontaneous vaginal delivery increases the risk of re-detachment of the retina in women who had a previous rhegmatogenous retinal detachment.

Although the ophthalmic community is more unanimous regarding this topic, it seems there is much variability throughout the obstetrics community.

A survey by Inglesby *et al.* 1990, reported that three-quarters of the 87 obstetricians questioned thought that previous retinal surgery was an indication for obstetric intervention (*e.g.* forceps or caesarian section) during labor [6].

Another study by Elsherbiny *et al.* 2003, surveying obstetricians practicing in the West Midlands Health Region,

United Kingdom, demonstrated that 32 of 66 respondents would consider previous RRD as an indication for cesarean section [7].

In 2008 Papamichael *et al.* conducted a survey among obstetricians attending the 20th European Congress of Obstetrics and Gynecology: 76% recommended assisted delivery (either cesarean section, forceps, or vacuum delivery) for pregnant females with risk factors for RRD. Generation was not a factor influencing this decision, and the majority (58%) based their decision to alter the management of labor on their personal opinion of the standard of care, a further 18% based their decision on local guidelines [8].

The most recent study from 2015 by Chiu and associates aimed to delineate delivery recommendations for females with high-risk pathologies for RRD among Canadian ophthalmologists, obstetricians, and trainees of respective specialties [5]. A total of 356 participants responded including 92 ophthalmologists and 27 trainees, and 185 obstetricians and 52 trainees. For healthy pregnant females with previously treated retinal hole/tear or treated RRD, significantly more obstetricians recommended cesarean section, and significantly more ophthalmologists recommended spontaneous vaginal delivery. Thirty-four percent of Canadian obstetricians surveyed recommended cesarean section or instrumental delivery at the time of delivery in healthy pregnant females with risk factors for RRD. In comparison, only 4% of Canadian ophthalmologists surveyed recommended intervention at the time of delivery. In the specific case of a previously treated retinal detachment 57% of obstetricians recommended instrumental delivery or cesarean, compared with 68% of ophthalmologists recommending spontaneous vaginal delivery [5].

One possible explanation for obstetricians' conception is the outdated theory that RRD is influenced by Valsalva-like maneuvers during the second stage of labor [9, 10]. This theory has long fallen out of favor because of increased knowledge of the properties of the vitreous and its interactions with the retina and the well-known pathophysiology of RRD [1].

A second possible explanation is the confusion with other types of retinal detachment, such as serous retinal detachment, in which fluid from choroidal vessels accumulates in the subretinal space, in the absence of a retinal tear. Serous retinal detachment is more frequent in pregnancy, the main causes being Pre-Eclampsia, HELLP syndrome, and Disseminated Intravascular Coagulation (DIC). Serous retinal detachment is not influenced by the method of delivery and usually resolves spontaneously postpartum, with a good prognosis for visual improvement [11].

Another aspect that cannot be disregarded is the medico-legal burden of modern clinical practice, and the development of defensive medicine, especially in the obstetrics field of medicine [12].

While there is quite a consensus among ophthalmologists that vaginal delivery is not contraindicated in the presence of RRD risk factors, there is limited published research on the effect of labor on the retina.

Literature shows that there is a need for a good evidence

base to encourage and reassure obstetricians that there is no indication for assisted delivery in women with RRD risk factors.

This retrospective cohort study, conducted in Rabin Medical Center, Israel found that the method of delivery does not have an impact on the recurrence of rhegmatogenous retinal detachment, as concluded in previous small studies [2 - 4].

This study's objective was to examine whether the method of delivery has an effect on RRD recurrence in a well-defined study group. In contrast to previous studies which examined the effect of labor on the retina in women with different pathologies, our study group comprised women with a history of previous RRD rather than variable risk factors, thus creating a well-defined study group. Using computerized records documenting over 10 years of patients surgically treated at the Ophthalmology Department in the Rabin Medical Center we sought to create a large study group, however, after implementing inclusion and exclusion criteria the study group included only 14 patients, which was the main limitation of this study. As a consequence of the small study group, all women in this study underwent scleral buckling, thus giving no data regarding the outcome of women treated with vitrectomy which is another common surgical treatment.

Due to the small study group, we believe further larger studies should follow, using computerized medical data, extended also to multicenter analysis which may provide significant data.

We conclude from this study that the method of delivery does not have an influence on the re-detachment of the retina. Despite being a small study group we believe this updated, well-defined study can give obstetricians a clear guideline that vaginal delivery is not contraindicated in women with previously treated rhegmatogenous retinal detachment, and no further evaluation is necessary rather than routine ophthalmologic follow-up. Furthermore, we hope this clear evidence provides both obstetricians and "mothers to be" peace of mind, enabling more informed, evidence-based medical practice.

## CONCLUSION

In summary, our study suggests that different methods of delivery do not have an influence on the recurrence of rhegmatogenous retinal detachment. Moreover, vaginal delivery is not contraindicated in women with previously treated rhegmatogenous retinal detachment and does not pose a risk for recurrence.

## LIST OF ABBREVIATIONS

- RRD** = Rhegmatogenous retinal detachment
- RPE** = Retinal pigment epithelium
- DIC** = Disseminated intravascular coagulation

## AUTHOR'S CONTRIBUTION

G Adler: Protocol development, Data collection, Data analysis, Manuscript writing A Dotan: Project development, Manuscript editing.

**ETHICAL STATEMENT**

The study protocol was approved by the institutional Helsinki Committee at Rabin Medical Center (0417-18-RMC).

**CONSENT FOR PUBLICATION**

Informed consent was obtained from the participants.

**STANDARDS OF REPORTING**

STROBE guidelines were followed.

**AVAILABILITY OF DATA AND MATERIAL**

The data supporting the findings of the article were collected from computerized files on Rabin Medical Center surgical data base, "Camelion" Rabin Medical Center medical data base and "Ofek" Clallit Health Services data base.

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None.

**CONFLICT OF INTEREST**

The authors declared no conflict of interest financial or otherwise.

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Declared none.

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