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Case report

Management of a rhegmatogenous retinal detachment in a pregnant patient

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ABSTRACT

Purpose: To describe the management of a rhegmatogenous retinal detachment (RRD) in a pregnant patient.
Observations: A 30-year-old, 26-week pregnant female presented with curtain vision loss in the left eye. Exam findings were significant in the left eye for an inferior fovea-sparing RRD. Care was coordinated and discussed with anesthesia and OB/GYN. The patient underwent surgery with monitored anesthesia care and a 41 scleral buckle, cryotherapy and C3F8 gas. The retina remained attached at 4 months post-operatively. A healthy girl was delivered via spontaneous vaginal delivery at 39 weeks.
Conclusion: Safe and successful treatment of RRD in pregnant patients can be achieved with careful coordination between ophthalmology, anesthesia, and obstetrics. An understanding of pregnancy specific considerations is important in order to optimize patient outcomes.

1. Introduction

Pregnancy can be associated with a myriad of ocular changes from physiologic to pathologic. The majority of ocular changes are benign and physiologic, such as the 14% of women who experience a refractive change during their pregnancy.[1] However, pathologic ocular changes, such as exudative retinal detachments, are more likely to occur in patients with concurrent pre-eclampsia and eclampsia.[2] Though ophthalmic conditions such as exudative retinal detachments have been documented during pregnancy,[3] reports of rhegmatogenous retinal detachment (RRD) and operative management are uncommon. We describe the management of a fovea-sparing RRD in a pregnant patient and review concerns regarding ophthalmic surgical care in pregnancy.

2. Case report

A 30-year old, 26-weeks pregnant, myopic female without other ocular history reported 5 days of a “shadow” in the left eye. The pregnancy had been uncomplicated thus far.

On examination, her best-corrected visual acuity was 20/20 OU, with no afferent pupillary defect. The patient had a left supero-temporal visual field defect to confrontation. The patient was phakic with a positive Shaffer sign on the left. Fundus examination of the left eye revealed an inferior retinal detachment, fluid extending into the inferior macula, and a hole at 5:30 (Fig. 1). There was no posterior vitreous detachment. The right eye was unremarkable.

Maternal fetal medicine performed pre and post-operative non-stress testing (NST). Surgery was performed using monitored anesthesia care with intravenous fentanyl and midazolam and a sub-tenons block of lidocaine and bupivacaine. The patient underwent placement of a 41 scleral buckle with cryotherapy to the causative break and 0.4 cc of 100% C3F8 was injected as the patient had demonstrated an ability to position on her side with face down. At 4 months post-operatively the retina remains attached (Fig. 2). At 39 weeks the patient delivered a healthy female via uncomplicated spontaneous delivery.

3. Discussion

This case report describes the management of a rhegmatogenous retinal detachment in a 26-week pregnant patient.

Ophthalmic surgery in a pregnant patient requires special considerations:

3.1. Timing

The second trimester of pregnancy is ideal for non-urgent non-elective surgery. During this time, the period of organogenesis has passed and the uterus is smaller than the 3rd trimester, making positioning easier. While the rate of miscarriage during the first trimester in the general population without surgery is similar to patients who have

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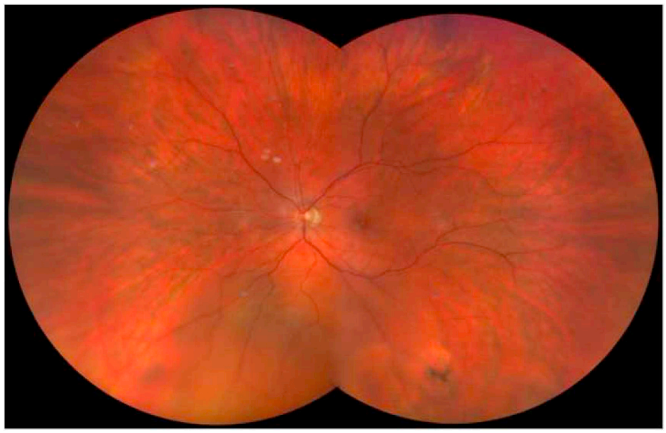

Fig. 1. Wide field fundus image of left eye pre-operatively.

undergone surgery for non-obstetric indications, common first trimester adverse outcomes such as miscarriage, vaginal bleeding, fetal structural anomalies may be attributed by the patient to the surgical experience.[4] However, non-elective surgery should not be delayed regardless of gestational age and surgery should be performed if it is in the best interest of the patient. Non-obstetric surgery has not been associated with increased rates of birth defects or spontaneous abortion.[4]

3.2. OBGYN co-management and perioperative monitoring

The American College of Obstetricians and Gynecologists recommends fetal heart rate monitoring by doppler before and after procedures for a previable fetus, which varies by institution but is generally less than 23–24 weeks. After 24 weeks, NST monitoring should be performed to assess fetal well-being before and after procedures at a minimum.[5] Intraoperative monitoring is an option for viable fetuses if personnel and facilities are able to deliver intraoperatively and the patient consents to emergency delivery if needed.

3.3. Anesthesia

Current anesthetic medications, including general anesthetics (nitrous oxide excluded), benzodiazepines, and opioids, have not been associated with increased rates of congenital anomalies, stillbirths, or adverse pregnancy outcomes.[6] However, avoiding general anesthesia when possible is always preferable to minimize fetal exposure. If general anesthesia were necessary, an appropriate understanding of additional pregnancy-related risks should be taken into account, including difficulty of intubation, increased aspiration risk, and thromboprophylaxis.[7]

Extensive studies on local anesthetic use, such as lidocaine, have not demonstrated an adverse effect on the pregnancy or fetus.[8] One study involving 60,000 pregnant females between 1959 and 1965 receiving local anesthetic, including benzocaine, procaine, tetracaine, and lidocaine, found no increase in the incidence of fetal complications.[9] Furthermore, another study by Hagai et al. that involved women exposed to local anesthetic during their first trimester found no significant difference in the rate of fetal birth defects.[10]

3.4. Positioning

Intra-operatively a patient in their second or third trimester should be positioned with a left tilt to avoid compression of the great vessels by the gravid uterus and allow adequate placental blood flow. When considering gas or oil injection, limitations of post-operative positioning must be taken into consideration based on the time of pregnancy, with patients further along more limited in their positioning.

3.5. Ophthalmic medications and surgical adjuncts

The U.S. Food and Drug Administration (FDA) historically classified medication use in pregnancy into categories A, B, C, D, and X (Table 1).[11] Notably, in December 2014 the FDA introduced new rules regarding drug and product labeling that require labeling to include a summary of risks during pregnancy and lactation which ophthalmologists may become more exposed to as drug labeling adapts.[12] The vast majority of topical ophthalmic medications are classified as category C

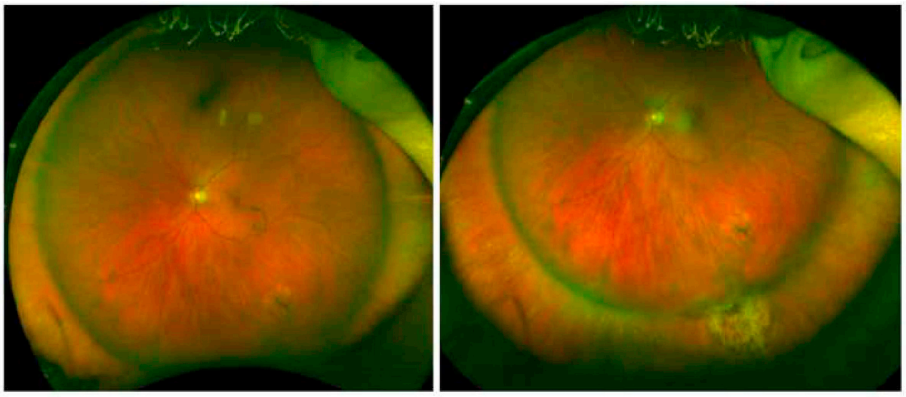

Fig. 2. Fundus image of left eye post-operatively.

Table 1
U.S. Food and Drug Administration pregnancy categories.

Category	Description
A	Well-controlled studies in humans show no risk to fetus
B	Animal studies show no risk to fetus; no well-controlled human studies conducted
C	Animal studies demonstrated an adverse effect on the fetus; no well-controlled human studies conducted
D	Evidence of risk to human fetus
X	Well-controlled studies in animal or humans demonstrates fetal abnormalities

Table 2
Ophthalmic medications by pregnancy category.

Drug Class	Medication Class						
	Anti-biotic	Anti-viral	Anti-fungal	Anti-hypertensive	Anti-allergy	Anti-inflammatory	Miscellaneous
A							
B	Tobramycin Erythromycin Azithromycin	Acyclovir (PO) Valacyclovir (PO)	Amphotericin B	Brimonidine			
C	Polymyxin B/Trimethoprim Polymyxin B/Bacitracin Neomycin/Polymyxin B/Hydrocortisone Gentamicin Ciprofloxacin Ofloxacin Levofloxacin Moxifloxacin	Ganciclovir	Ketoconazole (PO) Natamycin	Brinzolamide Timolol Latanoprost Bimatoprost Pilocarpine Methazolamide (PO) Acetazolamide (PO)	Olopatadine Ketotifen	Prednisolone Ketorolac Diclofenac Flurbiprofen Fluorometholone Loteprednol Cyclosporine	Phenylephrine Atropine Cyclopentolate Tropicamide Proparacaine Fluorescein (IV) Aflibercept (IVit) Bevacizumab (IVit) Ranibizumab (IVit)
D	Doxycycline (PO)					Prednisone (PO) Triamcinolone	
X							

*All topical ophthalmic application unless otherwise indicated.

by the FDA, indicating that there are no adequate well-controlled studies (Table 2).[13,14]

While systemic absorption of topically applied ophthalmic medications is well-established, these effects are typically insignificant in a healthy adult.[15] However, careful consideration of medication use in pregnancy is warranted given the potential for risk to the fetus. Furthermore, if a medication is considered necessary, strategies to enhance ocular exposure while minimizing systemic absorption should be implemented, such as punctal occlusion or use of higher viscosity medications (i.e. gels or ointments).[16]

4. Conclusion

In summary, ophthalmic surgery with an appropriate understanding of pregnancy-related considerations poses minimal additional risk to the pregnant patient and fetus and if emergent should not be delayed – as was the case with our patient. We utilized a minimalist approach that balances the benefit against minimizing any risk towards the fetus. Safe and successful outcomes can be achieved with clear communication and coordination between ophthalmology, anesthesia, and obstetrics.

Patient consent

The patient consented to publication of the case in writing/orally.

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Authorship

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CRediT authorship contribution statement

Cassandra C. Brooks: Writing - original draft, Investigation. **Frank Brodie:** Conceptualization, Writing - review & editing. **Rachel Brodie:** Validation, Writing - review & editing. **Matthew Buck:** Validation, Writing - review & editing. **Eric A. Postel:** Supervision, Writing - review & editing.

Declaration of competing interest

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