

CLINICAL COURSE AND CHARACTERISTIC OF EYES THAT UNDERWENT SURGICAL REPAIR OF A RHEGMATOGENOUS RETINAL DETACHMENT AFTER ENDOPHTHALMITIS

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FINANCIAL DISCLOSURE

- RYAN A. SHIELDS: NONE
- LIBING K. DONG: NONE
- SAM SUBRAMANIAN: NONE
- ALAN J. RUBY: REGENERON (ADBORD); COVALENT MEDICAL (BOARD MEMBER); ALLERGAN (SPEAKER)
- TAREK S. HASSAN: IOPEN: TYPE OF RELATIONSHIP: CONSULTANT (C), STOCKHOLDER (SH), NATURE OF COMPENSATION: HONORARIA (H); BVI/VISITREC, TYPE OF RELATIONSHIP: CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); ARCTICDX TYPE OF RELATIONSHIP: STOCKHOLDER (SH), NATURE OF COMPENSATION: NO COMPENSATION RECEIVED (NC); BAYER, TYPE OF RELATIONSHIP: ADVISORY BOARD (A), CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); F. HOFFMANN-LA ROCHE LTD, TYPE OF RELATIONSHIP: ADVISORY BOARD (A), CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); BROADSPOT, TYPE OF RELATIONSHIP: CONSULTANT (C), STOCKHOLDER (SH), NATURE OF COMPENSATION: NO COMPENSATION RECEIVED (NC); KATALYST SURGICAL, TYPE OF RELATIONSHIP: CONSULTANT (C), ADVISORY BOARD (A), NATURE OF COMPENSATION: INTELLECTUAL PROPERTY RIGHTS (IP); ALCON, TYPE OF RELATIONSHIP: CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); VITREQ, TYPE OF RELATIONSHIP: CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); SURGICUBE, TYPE OF RELATIONSHIP: CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); OCUGENIX, TYPE OF RELATIONSHIP: CONSULTANT (C), NATURE OF COMPENSATION: NO COMPENSATION RECEIVED (NC); REGENERON, TYPE OF RELATIONSHIP: ADVISORY BOARD (A), CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); ALLERGAN, TYPE OF RELATIONSHIP: ADVISORY BOARD (A), NATURE OF COMPENSATION: HONORARIA (H); OCULUS SURGICAL, TYPE OF RELATIONSHIP: CONSULTANT (C), OTHER (O), NATURE OF COMPENSATION: HONORARIA (H), INTELLECTUAL PROPERTY RIGHTS (IP); NOVARTIS, INC. TYPE OF RELATIONSHIP: CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H); GENENTECH, TYPE OF RELATIONSHIP: ADVISORY BOARD (A), CONSULTANT (C), NATURE OF COMPENSATION: HONORARIA (H)

SUMMARY

- THE RESULTS OF THIS STUDY DEMONSTRATE THAT RHEGMATOGENOUS RETINAL DETACHMENTS CAN DEVELOP AFTER ENDOPHTHALMITIS OF ANY ETIOLOGY, INCLUDING INTRAVITREAL INJECTIONS AND CATARACT SURGERY.
- SURGICAL REPAIR CAN BE PERFORMED IN ALMOST ALL CASES (88.3%) BUT EVEN WITH SUCCESSFUL SURGERY, VISUAL OUTCOMES REMAIN POOR (AVERAGE 20/765) PARTICULARLY IN CASES OF POSTINJECTION ENDOPHTHALMITIS AND STREPTOCOCCUS INFECTIONS.

BACKGROUND

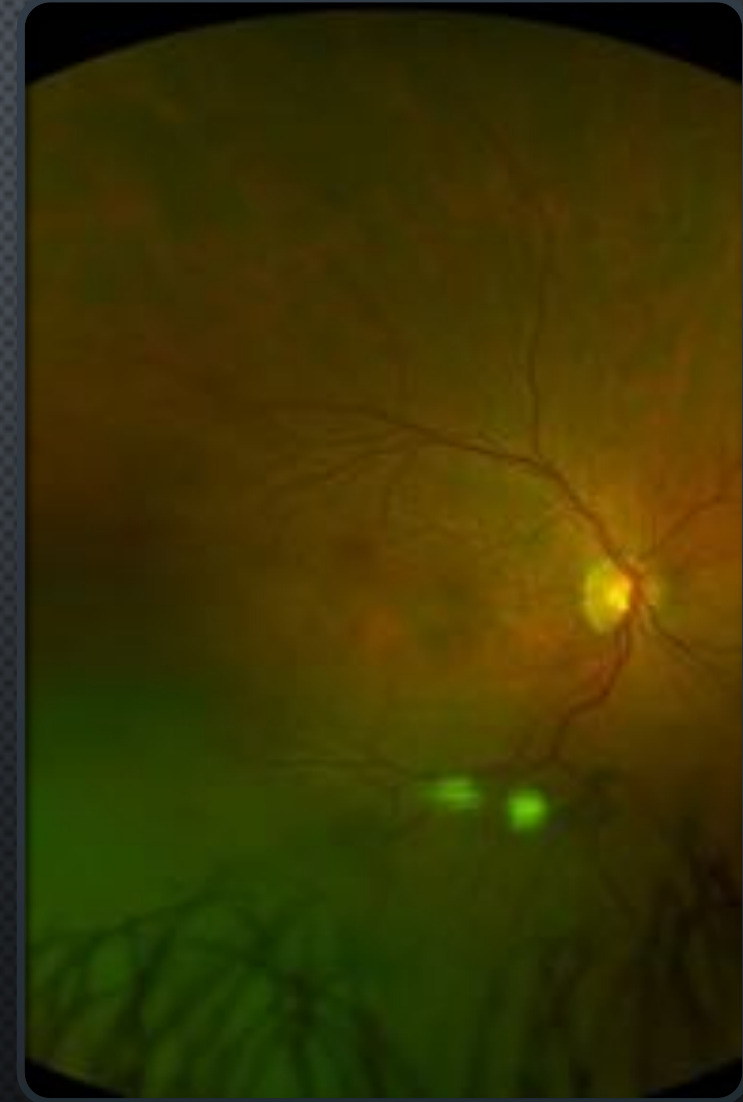
- FOLLOWING THE RESOLUTION OF ACUTE INFECTIOUS ENDOPHTHALMITIS, MULTIPLE PATHOLOGIC SEQUELAE CAN DEVELOP INCLUDING THE FORMATION OF CATARACTS, SYNECHIAE, CORNEAL SCARRING, GLAUCOMA, AND **RETINAL DETACHMENT**.
- THE DOCUMENTED INCIDENCE OF RHEGMATOGENOUS RETINAL DETACHMENTS (RRD) FOLLOWING ENDOPHTHALMITIS RANGES FROM 5% TO 21% AND FREQUENTLY RESULTS IN DEVASTATING VISION LOSS.¹⁻⁴

	Foster et al ¹	EVS ²	Chiquet ³	Dave ⁴
Type of Endophthalmitis	Postcataract > endogenous	Postcataract	Postcataract	Posttraumatic > postcataract > endogenous
# of Cases with an operable RRD	14	23	16	93
Anatomic surgical success	56%	78%	60%	93%
Final visual acuity (better than 20/400)	25%	66.7%	< 25%	39.7%

PURPOSE: TO EVALUATE THE INCIDENCE,
CLINICAL FEATURES, TREATMENTS, AND
OUTCOMES OF ALL EYES THAT DEVELOPED A
RETINAL DETACHMENT AFTER ENDOPHTHALMITIS

METHODOLOGY

- **DESIGN:** A RETROSPECTIVE, CONSECUTIVE CASE SERIES
- **STUDY POPULATION:** PATIENTS MANAGED AT ASSOCIATED RETINAL CONSULTANTS (ARC), ROYAL OAK, MICHIGAN
- **STUDY TIME:** JANUARY 2013 THROUGH DECEMBER 2019
- **INCLUSION:** PATIENTS WERE IDENTIFIED WITH ENDOPHTHALMITIS BY ICD-9/10 CODES AND REVIEWED TO IDENTIFY THOSE WHO SUBSEQUENTLY UNDERWENT SURGICAL REPAIR FOR RRD AFTER ENDOPHTHALMITIS.
- **EXCLUSION:**
 - THOSE WITH ENDOPHTHALMITIS AND/OR RRD NOT MANAGED AT ARC
 - THOSE THAT DEVELOPED AN INOPERABLE RRD
- **MAIN OUTCOME:** FINAL VISUAL ACUITY
- **SECONDARY OUTCOME:** FINAL ANATOMIC SURGICAL SUCCESS



METHODOLOGY – DATA COLLECTION

- **BASELINE:** DEMOGRAPHIC DATA AND VISION
- **ENDOPHTHALMITIS:** VISION, EXAMINATION, TREATMENT, CULTURE RESULTS, AND ETIOLOGY OF ENDOPHTHALMITIS
- **RETINAL DETACHMENT:** TIME BETWEEN ENDOPHTHALMITIS TO THE DEVELOPMENT OF RRD, VISION, MACULAR STATUS, DETACHMENT CONFIGURATION, CHOROIDAL DETACHMENT, PROLIFERATIVE VITREORETINOPATHY (PVR)
- **SURGICAL REPAIR:** SCLERAL BUCKLE, RETINECTOMY, SILICONE OIL USE, NUMBER OF SURGERIES (EXCLUDING SILICONE OIL REMOVAL), SINGLE SURGERY ANATOMIC SUCCESS AT 3 MONTHS, FINAL ANATOMIC SUCCESS, FINAL VISUAL ACUITY AND DURATION OF FOLLOW-UP



RESULTS – BASELINE & ENDOPHTHALMITIS

- 535 PATIENTS WITH ICD 9/10 CODES FOR ENDOPHTHALMITIS
 - 413 HAD A HISTORY OF INFECTIOUS ENDOPHTHALMITIS.
 - OF THOSE 413 PATIENTS, 19 DEVELOPED AN RRD.
 - TWO CASES WERE DEEMED INOPERABLE.
- THE INCIDENCE OF RRD DEVELOPMENT FOLLOWING TREATED ENDOPHTHALMITIS IN THIS STUDY WAS 4.6% (19 OF 413).
- THE INCIDENCE OF DEVELOPING AN OPERABLE RRD WAS 4.1% (17 OF 413).

Baseline and Endophthalmitis Features	N = 17	%
Female	11	64.7
Age (yrs)	78	56-93
Diabetes	6	35.3
Pseudophakia	13	76.5
Etiology of Endophthalmitis		
Intravitreal injection	8	47.1
Post-cataract surgery	6	35.3
Post-surgical other*	3	17.6
Treatment of endophthalmitis		
Tap/Antibiotics	13**	76.5
Vitreotomy/Antibiotics	4	23.5
Culture results		
No growth**	7	41.2
Streptococcus species	5	29.4
Staphylococcus species	4	23.5
Enterococcus	1	5.9
*includes post-vitreotomy, bleb related, and post-corneal transplant		
**includes 1 patient who only underwent intravitreal antibiotics without biopsy		

RESULTS: TIMING, DETACHMENT, INTRAOPERATIVE FEATURES

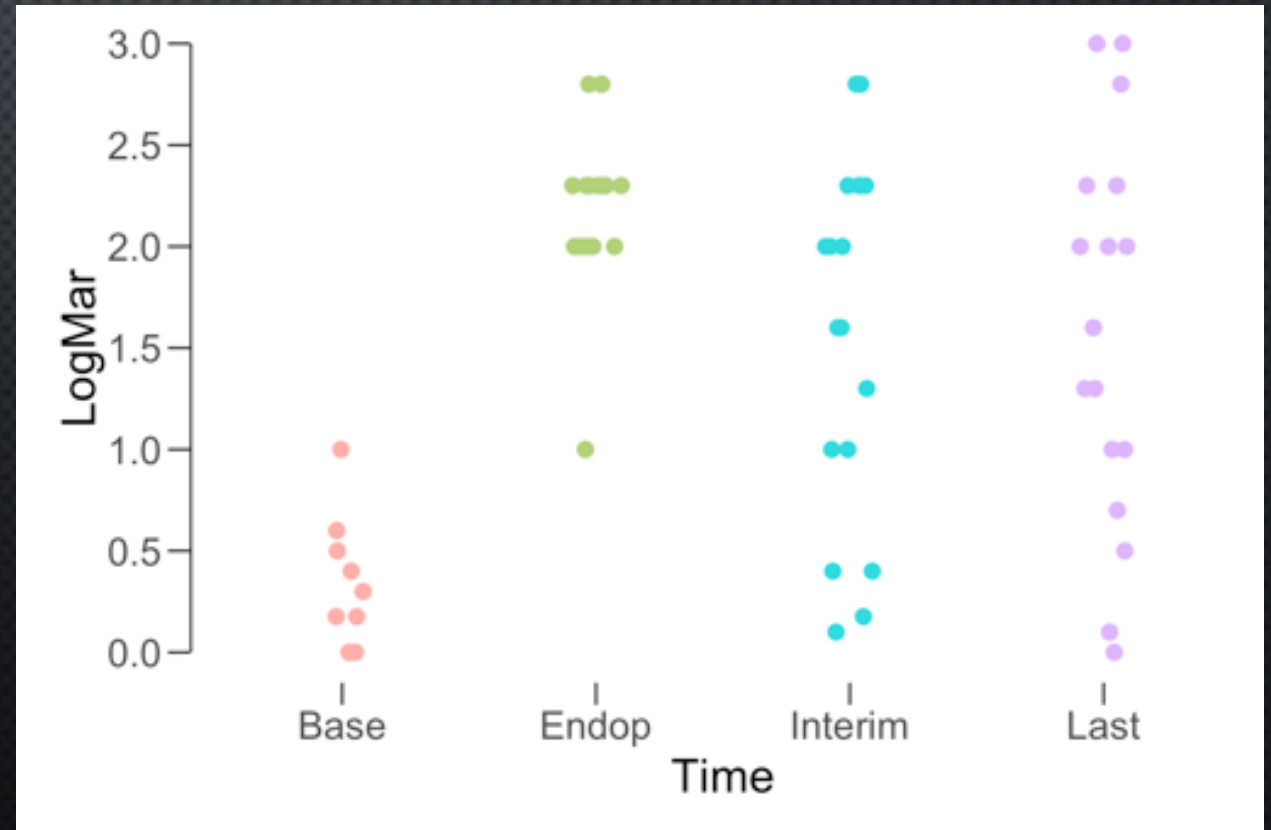
Retinal Detachment Features	N	%
Macula-sparing	3	17.6
Configuration of detachment		
Total	7	41.2
Inferior	5	29.4
Superior	4	23.5
Temporal	1	5.9
Presence of choroidal detachment	4	23.5
Presence of proliferative vitreoretinopathy	10	58.8

Timing	Average	Range
Time from intervention to endophthalmitis (days)	7.8	1 - 61
Time from endophthalmitis to diagnosis of retinal detachment (days)	80.3	12 - 421
Time from last surgery to last follow-up (days)	599.2	85 - 2015

RESULTS: OUTCOMES

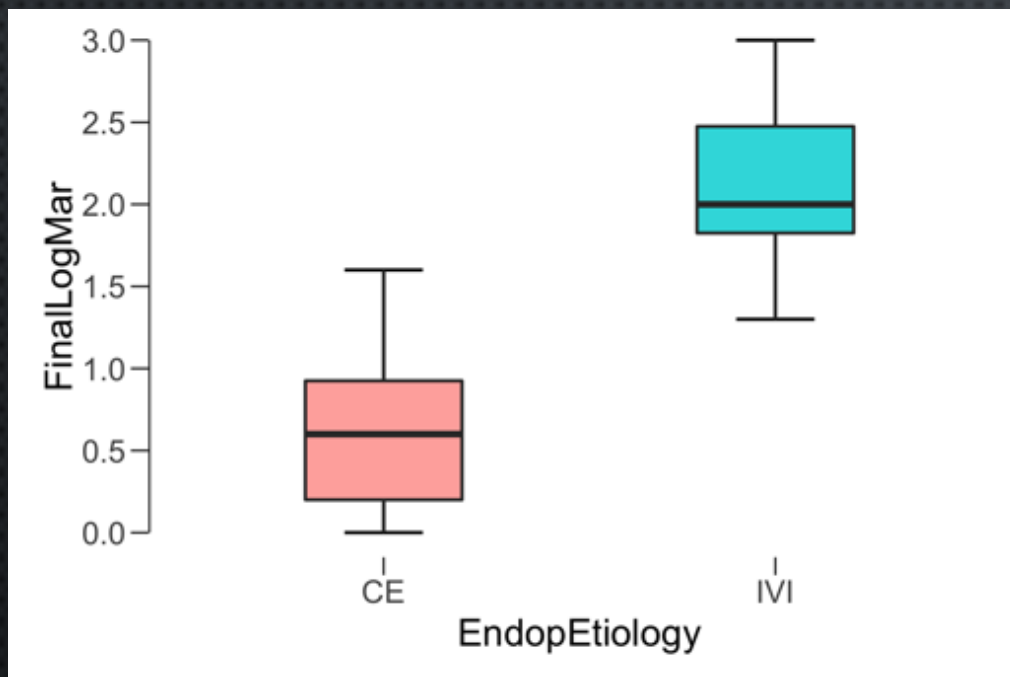
- THE SINGLE SURGICAL SUCCESS RATE WAS 70.6% (12 OF 17).
- FINAL ANATOMIC SUCCESS WAS ESTABLISHED IN 88.3% OF PATIENTS (15 OF 17).
- THE AVERAGE NUMBER OF SURGERIES REQUIRED FOR FINAL ANATOMIC SUCCESS, EXCLUDING SILICONE OIL REMOVAL, WAS 1.4 (RANGE 1 TO 4).
- THE AVERAGE VA PRIOR TO DEVELOPING ENDOPHTHALMITIS WAS 0.35 (SNELLEN 20/44). AVERAGE VA PRIOR TO DEVELOPING RRD WAS 1.53 (SNELLEN 20/678). AVERAGE FINAL VA WAS 1.58 (SNELLEN 20/765).
- ONLY 8 (47%) PATIENTS ACHIEVED A FINAL VA OF 20/400 OR BETTER.

Surgical Features	N =17	%
Primary Vitrectomy	14	82.4
Vitrectomy/Scleral buckle	3	17.6
Required retinectomy	6	35.3
Required silicone oil at primary repair	9	52.9

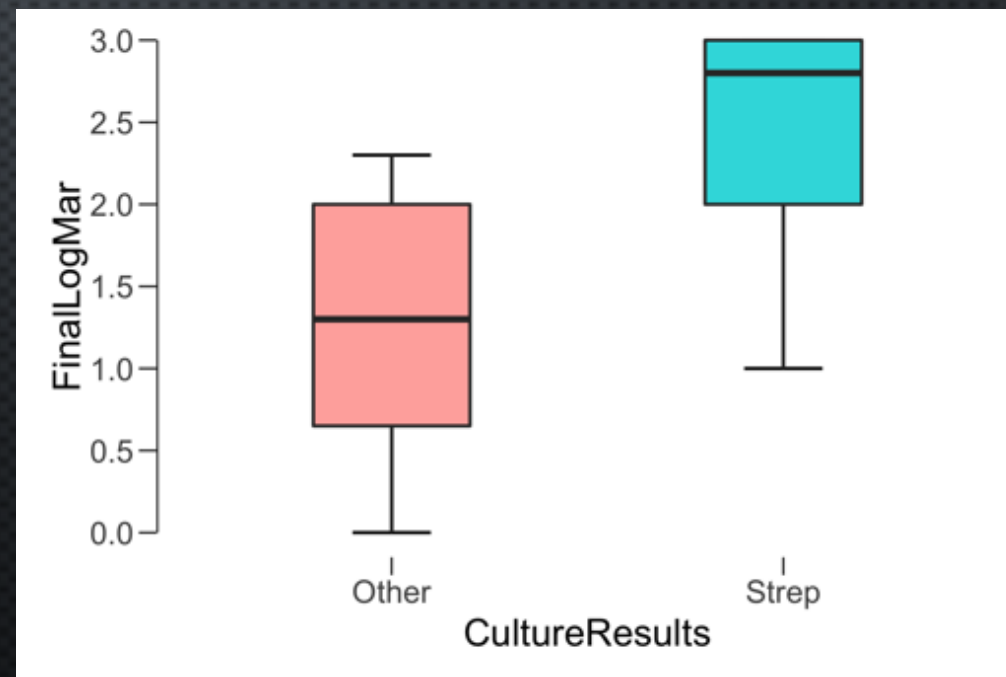


RESULTS: RISK FACTORS ASSOCIATED WITH WORSE VISUAL OUTCOMES

INTRAVITREAL INJECTION COMPARED TO CATARACT SURGERY ($P = 0.001$)

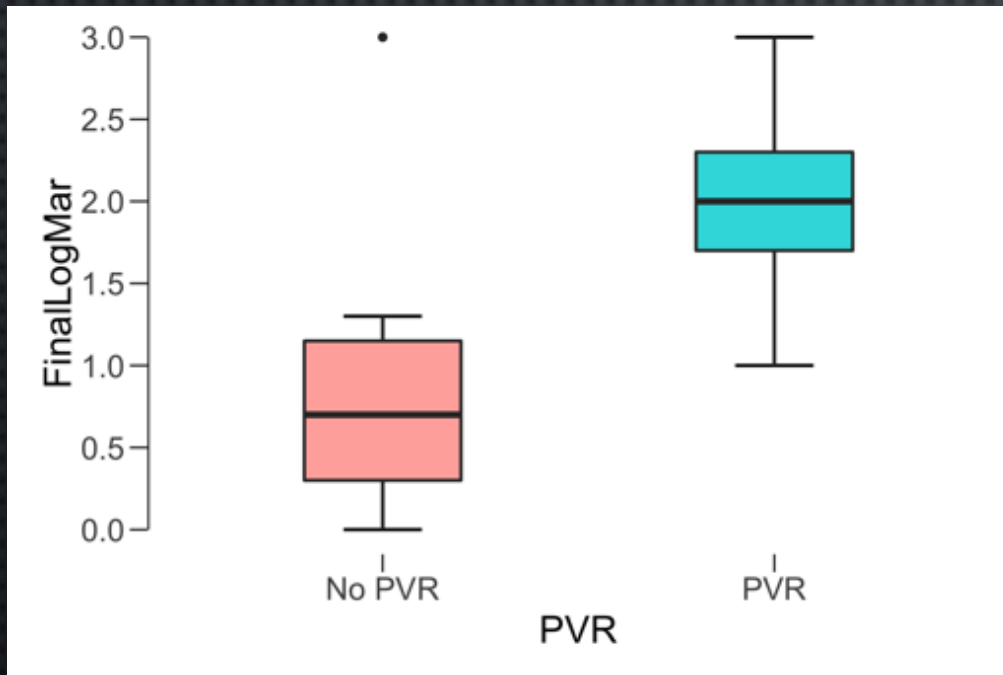


STREPTOCOCCUS COMPARED TO OTHER CULTURE RESULTS ($P = 0.024$)

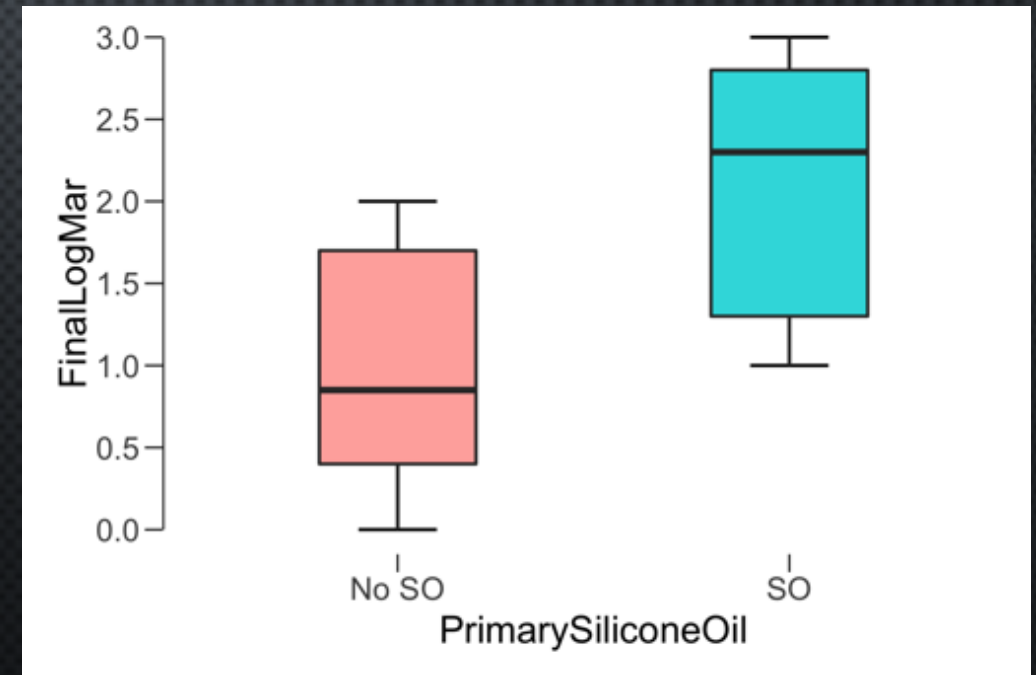


RESULTS: RISK FACTORS ASSOCIATED WITH WORSE VISUAL OUTCOMES

PVR COMPARED TO NO PVR ($p = 0.015$)



SILICONE OIL FOR PRIMARY REPAIR ($p = 0.010$)



FACTORS THAT **DID NOT** LEAD TO WORSE VA

- GENDER ($P = 0.18$)
- AGE ($P = 0.09$)
- DIABETES STATUS ($P = 0.14$)
- VITRECTOMY COMPARED TO INTRAVITREAL BIOPSY AND ANTIBIOTICS ($P = 0.27$)
- TIME FROM ENDOPHTHALMITIS TO RRD ($P = 0.80$)
- DETACHMENT CONFIGURATION ($P = 0.45$)
- PRESENCE OF A CHOROIDAL DETACHMENT ($P = 0.18$)
- TOTAL NUMBER OF SURGERIES ($P = 0.77$)

CONCLUSION

	Foster et al ¹	EVS ²	Chiquet ³	Dave ⁴	Current Study
Type of Endophthalmitis	Postcataract > endogenous	Postcataract	Postcataract	Posttraumatic > postcataract > endogenous	Intravitreal injection > postcataract
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