# Clinical Outcomes And Treatment of Eyes with Neovascular Age-Related Macular Degeneration Following Endophthalmitis

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#### Disclosures

• No relevant financial disclosures.





## Summary

- NVAMD became quiescent in 13.6% of eyes after resolution of endophthalmitis.
- Patients required less frequent intravitreal injections for NVAMD after endophthalmitis.
- There was an initial decrease in VA after endophthalmitis that improved after reinitiating anti-VEGF treatment.
- There was no association between anti-VEGF drug, anesthetic choice, povidone concentration, or any intra-procedure variable and the rate of endophthalmitis.







• To evaluate the clinical course of patients with neovascular age-related macular degeneration (NVAMD) after developing endophthalmitis.





#### Methods

- Multicenter, retrospective, case series, 5 geographic locations
- Charts of 196,598 intravitreal injections performed for patients with NVAMD, treated between April 22, 2013 and October 15, 2018, were searched for the development of endophthalmitis.
- A large array of data was collected.





#### **Patient Characteristics**

- Mean age: 84.7±0.98 years (range 64 103 years)
- Females: 72%
- Race:
  - White: 94.7%
  - Latino: 2.7%
  - Black: 1.3%
  - Asian: 1.3%
- Pseudophakic: 88.0%





## Incidence of Endophthalmitis

- 75 cases of endophthalmitis per 196,598 intravitreal injections
  - incidence 0.03815% (1 in 2,620)





## Endophthalmitis Treatment

- Intravitreal Tap and Injection: 96%
  - Intravitreal Vancomycin (1 mg/0.1 mL) and Ceftazidime (2.25 mg/0.1 mL)
  - 18.1% also received intravitreal dexamethasone (400 mcg/0.1 mL)
- Immediate Pars Plana Vitrectomy: 4%





## Intravitreal Culture

- Positive culture: 30.7%
  - 69.6% Staphylococcus
  - 21.8% Streptococcus
  - 4.3% Pseudomonas
  - 4.3% Enterococcus





#### Intra-procedure Variables & Endophthalmitis

- Analysis of all 196,598 intravitreal anti-VEGF injections showed no significant associations between any intra-procedure variable and the rate of endophthalmitis
  - anti-VEGF drug (p=0.29; aflibercept, bevacizumab, ranibizumab)
  - anesthetic choice (p=0.26; 2% lidocaine gel, 0.5% tetravisc, subconjunctival lidocaine 2%, or topical tetracaine 1%)
  - injection site (p=0.33)
  - povidone concentration (p=0.22; 2.5%, 5%, 10%, or combo)
  - speculum use (p=0.35)
  - glove use (p=0.48)
  - strict no talking policy (p=0.64)
  - mask use (p=0.47)
  - post-injection povidone (p=0.71)
  - topical antibiotics pre- or post-injection (p=0.62)
  - eyewash use (p=0.92; fresh bottle each time, reused bottle, no wash)
  - volume of injections performed (p=0.50)
  - treating physician (p=0.82)
  - clinic location (p=0.95)





## NVAMD Disease Activity After Endophthalmitis

- 17 patients (22.7%) were not re-treated for NVAMD
  - Mean follow-up 115 ± 8.4 weeks
- In 10 cases (13.3%) due to quiescence or CNVM involution
- In 7 cases (9.3%) due to poor prognosis





#### **NVAMD** Treatment Interval post-Endophthalmitis

- Treatment for NVAMD was reinitiated in 58 patients (77.3%)
  - At a mean of 13.8 ± 1.48 weeks after endophthalmitis
- Patients required less frequent anti-VEGF injections after endophthalmitis
  - Interval of 7.36 ± 0.61 weeks prior vs 11.6 ± 1.78 weeks after (p=0.003)





#### NVAMD Treatment Interval post-Endophthalmitis

- This difference reflected an increase in the treatment interval after the first 3 injections pre- and post-endophthalmitis.
- No difference for last 3 injections prior to endophthalmitis (6.75 ± 0.81 weeks) compared to first 3 injections after reinitiating treatment (7.78 ± 1.05 weeks; p=0.24).





## Intravitreal Anti-VEGF Drug

- Intravitreal anti-VEGF drug used immediately before endophthalmitis:
  - Ranibizumab 0.5 mg in 34 cases (45.3%)
  - Aflibercept in 28 cases (37.3%)
  - Bevacizumab in 13 cases (17.3%)
- Intravitreal anti-VEGF drug used immediately after endophthalmitis (n=58):
  - Ranibizumab 0.5 mg in 28 cases (48.3%)
  - Aflibercept in 25 cases (43.1%)
  - Bevacizumab in 3 cases (5.2%)
  - Photodynamic therapy in 2 cases (3.4%)





## **logMAR** Visual Acuity

- just prior to endophthalmitis: 0.585±0.053 (20/77)
- on endophthalmitis presentation: 1.67±0.08 (20/940, p<0.001)
- on post-endophthalmitis-treatment day 1: 1.94±0.064 (CF, p<0.001)
- on post-endophthalmitis-treatment week 1: 1.61±0.081 (20/820, p=0.31)
- final, after re-initiating anti-VEGF: 1.02±0.11 (20/210, p<0.001)





## **Multivariate Analysis**

- logMAR VA on the visit prior to endophthalmitis was significantly associated with the need to reinitiate treatment (p=0.034)
- Treatment interval pre-endophthalmitis was significantly associated with the need to retreat NVAMD after endophthalmitis (p=0.006)
- Post-endophthalmitis treatment interval was significantly associated with the anti-VEGF drug chosen
  - 11.0±1.94 weeks for aflibercept
  - 11.4±3.83 weeks for ranibizumab 0.5 mg
  - 8.97±1.83 weeks for bevacizumab (p<0.001).





#### **Multivariate Analysis**

- Patients with a positive strep. culture had worse final VA (logMAR VA 2.10±0.739; between CF and HM vision) than patients with:
- a positive staph. culture (p=0.028; logMAR VA 0.817±0.203; ~20/130) or
- a negative culture (p=0.015; logMAR VA 0.978±0.122; ~20/190)





## Analysis of Anatomic Changes

- At the time of reinitiation of treatment for NVAMD:
  - 5.26% increase in choroidal neovascular complexes
  - 7.41% decrease in intraretinal fluid
  - 24.2% decrease in subretinal fluid
- After reinitiating treatment, at the final study visit:
  - 21.1% reduction or involution of CNV complexes
  - 30.3% reduction in SRF
  - 125% increase in subretinal fibrosis
    - 18 cases after endophthalmitis, compared to 8 cases before
    - Half of the new cases of fibrosis (n=5) occurred in patients that were not retreated for NVAMD
- In 33% of cases without reinitiation of anti-VEGF, there was subretinal fibrosis on the final visit, compared to 21.7% of cases in which anti-VEGF was reinitiated (p=0.001).





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