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Case Series: Macular Hole Closure with Dexamethasone Implant

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Abstract

Introduction: *Few studies have shown how a dexamethasone implant can be successful in treating macular holes that persisted following non-invasive topical eye drops and traditional attempted surgical repair with vitrectomy, internal limiting membrane (ILM) peeling, and intravitreal gas injection[1.5]. This case series investigates the effectiveness of dexamethasone implants as an initial, nonsurgical treatment alternative for the repair of full-thickness macular holes (FTMHs)*

Methods: *Nine patients presenting with full-thickness macular holes were treated with Ozurdex (dexamethasone implant). These patients were treatment naive and were not previously vitrectomized. Upon receiving the implant, the patients were evaluated monthly with dilated fundus examination and optical coherence tomography (OCT) to determine macular hole closure.*

Results: *The Ozurdex implant was successful in closing the macular hole in three cases out of the nine cases (33% success rate) without the need for surgical or secondary intervention. On average, the macular hole closed within 3 months after the corticosteroid implantation.*

Conclusion: *Though the overall success rate of FTMH closure with Ozurdex is low, further investigation into the ability of Ozurdex to treat small macular holes with cystoid macular edema (CME) is warranted.*

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Introduction

A full-thickness macular hole (FTMH) is a vitreoretinal defect in the macula,6 affecting approximately 7.8 persons per 100,000 per year.3 The development of a macular hole can result from trauma or age-related changes to the vitreous during the formation process of a posterior vitreous detachment (PVD). Symptoms include decreased visual acuity, central scotoma, or metamorphopsia. Macular holes can be diagnosed using a combination of optical coherence tomography (OCT) and fundus examination. Surgical repair traditionally involves pars plana vitrectomy, peeling of the internal limiting membrane (ILM), and an intravitreal gas injection. Post-operative face-down head positioning is typically recommended. Successful macular hole closure rate following standard surgical repair is reported to be 90-100%.7 However, some patients may find surgical intervention with its post-operative measures inconvenient, or may be poor surgical candidates due to other underlying health issues.

Ozurdex is an intravitreal dexamethasone implant, which hinders inflammatory cytokines. It is FDA approved for the treatment of macular edema due to diabetes, retinal vein occlusions, and
uveitis. Cystoid macular edema (CME) is often noted in association with macular holes. Thus, it was hypothesized that Ozurdex may potentially be used as an alternative to standard surgical repair in the treatment of full-thickness macular holes.1,5 The overall purpose for this case series is to determine the effectiveness of Ozurdex as a primary treatment for macular holes and to offer a less invasive alternative treatment compared to standard surgical repair for macular holes with no required face-down head positioning.

Methods

We conducted a prospective case series on patients who presented with acute FTMH between December 2023 and January 2025. The patients were all treatment-naive and had no history of previous vitrectomy. Patients were offered standard surgical repair versus Ozurdex implantation. 9 patients elected to proceed with Ozurdex implant as a first-line treatment for the macular hole. The size of the macular hole as measured on OCT, macular hole stage, presence of associated CME, and PVD status at presentation were documented. There were no complications during injection of the Ozurdex implants in the 9 patients. The patients were subsequently followed for 2-4 months to monitor for macular hole closure. Successful macular hole closure was confirmed on OCT (See Image 1 and Image 2). The Chi-square test was used to analyze if the macular hole stage was significant in affecting the success of Ozurdex in macular hole closure. The Fisher Exact text was used to analyze if the PVD status, presence of CME, or history of trauma was significant in affecting the success of Ozurdex in macular hole closure. The t-test was used to determine if the macular hole size was significant in affecting the success of Ozurdex in macular hole closure.

Results

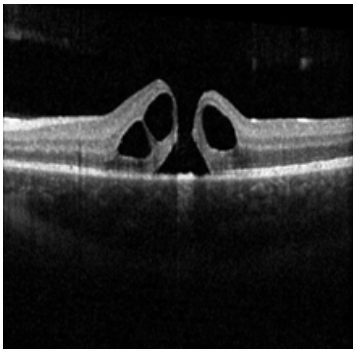

Figure 1: Macular Hole Before Ozurdex

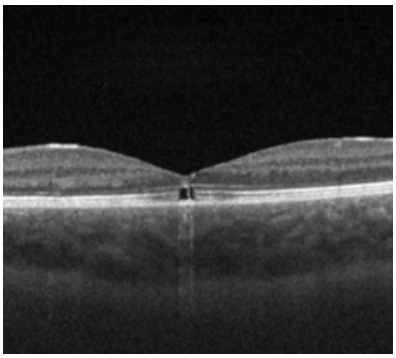

Figure 2: Macular Hole Closure Post-Ozurdex

Figure 1 Showcases OCT imaging of a case within the series before treatment with Ozurdex.
Figure 2 Reveals the outcome of the same case within the series post-Ozurdex. Evidently, the hole was successfully closed.

Table 1: Demographics

Mean Age:	58	
Age Range	12 to 86	
Gender:	44% M	56% W

*No statistically significant difference in demographics between successes and failures.

Table 1 provides the demographics (age and gender) for the case series. The average age amongst the 9 cases in the series was 58 years old, ranging from 12 years old to 86 years old. There were 5 female subjects (56%) and 4 male subjects (44%).

Table 2: Results
Significant is $p<0.05$*

Macular Hole Size			
Mean Minimal Diameter:	304 µm		p-value: 0.1686
Mean Base Diameter:	686 µm		p-value 0.2187
Macular Hole Stage	Success # (%)	Fail #(%)	p-value: 0.2207
1	0 (0%)	0 (0%)	
2	2 (22%)	2 (22%)	
3	0 (0%)	2 (22%)	
4	1 (11%)	2 (22%)	
PVD Status			p-value: 1.0000
Present	1 (11%)	2 (22%)	
Absent	2 (22%)	4 (44%)	
CME			p-value: 0.3333
Present	2 (22%)	6 (66%)	
Absent	1 (11%)	0 (0%)	
History of Trauma			p-value: 0.2262
Present	2 (22%)	1 (11%)	
Absent	1 (11%)	5 (55%)	

Table 2 illustrates the macular hole size, stage, and secondary pathologies associated with FTMHs. The average minimal diameter of the FTMHs in the case series is 304 µm and the average base diameter is 686 µm. The p-values for both average measurements are 0.1686 and 0.2187, respectively, via the t-test. The macular hole stages in conjunction with successes and failures were recorded as followed: stage 1 had 0 (0%) successes and 0 (0%) failures, stage 2 had 2 successes (22%) and 2 failures (22%), stage 3 had 0 successes (0%) and 2 failures (22%), stage 4 had 1 success (11%) and 2 failures (22%). Using the Chi-square test, the p-value is 0.2207. The presence of a PVD had 1 success (11%) and 2 failures (22%), and the absence of a PVD had 2 successes (22%) and 4 failures (44%). The p-value is 1.000 via the Fisher exact test. The presence of CME had 2 successes (22%) and 6 failures (66%), and the absence of CME had 1 success (11%) and 0 failures (0%). The p-value is 0.3333 via the Fisher exact test. The presence of prior trauma had 2 successes (22%) and 1 failure (11%), and the absence of prior trauma had 1 success (11%) and 5 failures (55%). According to the Fisher exact test, the p-value is 0.2262. Overall, none of the components in table 2 were significant in affecting the success of Ozurdex in macular hole closure. Of the 9 patients in the study, 3 patients had successful closure of the

macular hole with Ozurdex. Thus, the success rate was 33%. The average time between administration of Ozurdex and FTMH closure was approximately 3 months [1-7].

Conclusion

The prominent limitation of the study was the small sample size. Though the overall success rate of FTMH closure with Ozurdex is low, further investigation into the ability of Ozurdex to treat small macular holes with CME is warranted.

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