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Editorial

Modern Diagnostics and Therapy for Vitreoretinal Diseases

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Modernvitreoretinal care increasingly depends on recognizing disease activity before irreversible visual loss occurs. As emphasized in our introductory letter, therapeutic advances have expanded the possibilities for treating exudative retinal disease and geographic atrophy, while diagnostic platforms continue to evolve [1,2]. The clinical value of these developments depends on how effectively diagnostic information guides intervention. This Special Issue of Medicina, "Modern Diagnostics and Therapy for Vitreoretinal Diseases," brings together five contributions examining that relationship through home monitoring, retinal imaging, surgical outcomes, and systemic inflammatory biomarkers. Together, they encourage a more individualized approach to detecting change and evaluating treatment success.

Home monitoring is a central theme. Busquets and colleagues [3] review a 25-year scientific journey in developing and implementing digital health solutions for age-related macular degeneration (AMD). Their discussion addresses two distinct clinical needs: detecting conversion from intermediate nonexudative AMD to neovascular disease and identifying recurrent activity in eyes already receiving treatment. Both situations expose the limitations of relying exclusively on symptoms and scheduled examinations. The review describes how functional testing, patient-operated optical coherence tomography (OCT), and automated analysis can extend surveillance beyond the clinic. It also emphasizes that successful implementation requires usable devices and an organized service capable of translating monitoring results into clinical action. The randomized HOME study provides complementary evidence: preferential hyperacuity monitoring plus standard care reduced visual acuity loss at detection of neovascular conversion compared with standard care alone [4]. This evidence concerns functional monitoring for conversion and should not be extrapolated directly to home OCT-guided retreatment.

Sambhara and colleagues [5] examine the interval between disease recurrence and its recognition during standard care. In an ad hoc analysis of three observational cohorts, treating physicians were masked to home OCT findings. Among 185 eligible care intervals from 119 eyes, persistent or recurrent fluid occurred in 121 intervals, approximately 65%, and was identified an average of 32 days before the next office visit. These observations demonstrate how frequently disease activity may remain undetected between scheduled assessments. They support home OCT as an adjunct for identifying patients who may need earlier evaluation. Because treatment was not directed by the monitoring data, the analysis does not establish that earlier notification improves visual outcomes.

Read together, these papers make a practical case for evaluating disease over time. An office OCT scan describes retinal anatomy at one encounter; repeated home imaging can reveal when fluid appears and how it evolves. Deep learning has demonstrated the ability to analyze retinal OCT and generate diagnostic and referral recommendations,

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supporting the potential for artificial intelligence to help interpret larger imaging datasets [6]. The next challenge is determining which changes warrant action and whether acting on them improves outcomes without imposing unnecessary visits or treatment. Prospective comparative studies should therefore assess visual function alongside treatment burden, adherence, and the resources needed to manage alerts. Implementation will also require attention to patients whose physical limitations or living circumstances make regular self-testing difficult.

The surgical contributions similarly show why detailed assessment matters. Giansanti and colleagues [7] investigate retinal displacement after primary rhegmatogenous retinal detachment repair using blue-fundus autofluorescence. Their retrospective study evaluates displacement in relation to clinical characteristics and postoperative function. By examining the spatial relationship between retinal vessels and autofluorescent vessel markings, this approach adds information to the conventional assessment of retinal attachment. The clinical implication is that postoperative evaluation should consider not only whether the retina remains attached, but how the retina has reattached. Further prospective work with standardized imaging and functional testing could clarify how displacement relates to patients' visual experience and which surgical or postoperative measures influence its occurrence. Earlier comparative observational work also found that displacement frequency differed between pneumatic retinopexy and vitrectomy, reinforcing the relevance of postoperative retinal position while leaving causal interpretation limited by study design [8].

Kakehashi and colleagues [9] examine another situation in which morphology may distinguish clinically important subgroups. Their exploratory retrospective study compares full-thickness macular holes without posterior vitreous detachment in eyes with and without epiretinal proliferation. Only five eyes had epiretinal proliferation, compared with 32 eyes without it. Two eyes in the proliferation group had persistent holes, and three had postoperative ellipsoid zone defects. These findings suggest that epiretinal proliferation may identify a phenotype requiring particular attention during surgical planning and counseling. The small subgroup limits the precision and generalizability of the results, however, and larger studies are needed before a preferred surgical strategy can be established for these eyes. The distinction between epiretinal proliferation and conventional epiretinal membrane was previously characterized by OCT, predominantly in lamellar macular holes; this provides morphological context rather than direct evidence for a preferred full-thickness macular hole technique [10].

Kazantzis and colleagues [11] broaden the diagnostic discussion beyond ocular imaging in their systematic review of the neutrophil-to-lymphocyte ratio and other full blood count indices in retinal disease. The reviewed literature reports associations between these readily available inflammatory measures and several retinal conditions, including diabetic retinopathy, neovascular AMD, and retinal vein occlusion. An earlier clinical study likewise reported higher neutrophil-to-lymphocyte ratios in diabetic patients with retinopathy than in those without retinopathy [12]. Such findings support further investigation of systemic inflammation in retinal disease. Their clinical interpretation requires caution because these indices are nonspecific and may reflect systemic illness or other confounding factors. Establishing reproducible thresholds and demonstrating predictive value beyond existing clinical and imaging information will be necessary before they can reliably inform individual treatment decisions, truly unlocking the potential within the field of oculomics.

Across these contributions, a common question emerges: what additional information changes patient care? Home monitoring may reveal activity between visits, autofluorescence may characterize postoperative retinal position, and OCT may identify structural features associated with different surgical outcomes. Blood-derived indices offer a further avenue for investigating disease biology. Each approach requires validation appropriate to its

intended use. Detecting an abnormality, demonstrating an association, and proving that a management change benefits patients are separate steps. Keeping these distinctions clear will help clinicians adopt useful innovations while preserving an accurate understanding of the evidence supporting them.

The original scope of this Special Issue included pharmacotherapy and geographic atrophy as well as diagnostic and surgical innovation. The published collection places particular emphasis on surveillance, structural characterization, and the interpretation of clinical findings. These areas remain directly relevant as therapeutic options expand, because treatment decisions depend on recognizing the right disease features at the right time. Future studies should connect increasingly detailed measurements with outcomes that matter to patients, including useful vision, visual distortion, and the burden of ongoing care.

We thank the contributing authors and reviewers for advancing these discussions. Their work identifies opportunities to strengthen vitreoretinal care through earlier recognition of change and more precise assessment of outcomes. We hope this collection encourages further investigation into how evolving diagnostic tools can guide timely, individualized treatment and preserve visual function.

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