

Proliferative Diabetic Retinopathy with Vitreous Hemorrhage in a 43-Year-Old Man: A Case Report

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Abstract. Proliferative diabetic retinopathy (PDR) is a leading cause of blindness among working-age adults worldwide. This case report presents a 43-year-old male with bilateral PDR complicated by vitreous hemorrhage and cataract, highlighting the importance of early detection and comprehensive management. A 43-year-old male presented with progressive blurring of vision over three months, described as seeing black shadows and floating spots. His right eye had already lost all vision, while the left eye remained severely blurred. The patient had a five-year history of diabetes mellitus managed with insulin. Ophthalmic examination revealed visual acuity of 1/∞ in the right eye and 1/60 in the left eye. Funduscopy was obscured due to media opacity, and B-scan ultrasonography demonstrated diffuse internal echoes in the vitreous cavity consistent with vitreous hemorrhage. Lens opacity was also noted bilaterally. The patient was diagnosed with bilateral proliferative diabetic retinopathy with vitreous hemorrhage and cataract. A combined surgical approach involving phacoemulsification with intraocular lens implantation and pars plana vitrectomy with endolaser and gas/silicone oil tamponade was planned for the left eye. PDR develops as a consequence of chronic hyperglycemia-induced retinal ischemia, leading to neovascularization through increased VEGF. The presence of vitreous hemorrhage in this patient indicates advanced disease requiring surgical intervention. Management of PDR includes panretinal photocoagulation, anti-VEGF therapy, and vitrectomy. This case underscores the vision-threatening nature of PDR and the importance of early detection through regular screening in diabetic patients. Management requires a multidisciplinary approach with meticulous glycemic control and timely surgical intervention when indicated.

Keywords: Diabetic Retinopathy, Proliferative Diabetic Retinopathy, Vitreous Hemorrhage, Case Report

Received: July 5, 2026

Received in Revised: August 19, 2026

Accepted: September 26, 2026

INTRODUCTION

Diabetic retinopathy (DR) is the most common microvascular complication of diabetes mellitus and remains a leading cause of visual impairment and blindness in productive-age individuals worldwide. Shyam et al. (2025) reported that DR is a leading cause of blindness in the working-age population and develops through complex pathophysiological mechanisms. Yau et al. (2012) reported that the global prevalence of DR is estimated to reach 27% in the diabetic population, with approximately one-third of patients progressing to proliferative diabetic retinopathy (PDR) or diabetic macular edema. In Indonesia, Sasongko et al. (2021) found a high prevalence of DR, reaching 43.1% in type 2 diabetes patients aged ≥30 years, with sight-threatening DR accounting for 26.3% of cases.

Align with research from Ahmad & Nawaz (2022), Arrigo et al. (2022), Capitão & Soares, (2016), Al-Kharashi (2018), Cai et al. (2022), Behl & Kotwani (2015), Sun & Aiello, (2022) Proliferative diabetic retinopathy is an advanced stage of DR characterized by retinal neovascularization due to ischemia that stimulates increased vascular endothelial growth factor (VEGF). Seo et al. (2025) explained that newly formed blood vessels are fragile and easily ruptured, causing vitreous hemorrhage, tractional retinal detachment, and severe vision loss. Kusahara et al. (2018) added that the pathophysiology of PDR is complex, involving chronic hyperglycemia, oxidative stress, inflammation, and neurodegeneration in the retinal neurovascular unit. Xu et al. (2024) demonstrated that the combination of panretinal photocoagulation with anti-VEGF injection is an effective and safe modality for treating diabetic vitreous hemorrhage in high-risk PDR patients.

Recent advances in PDR management include intravitreal anti-VEGF therapy, panretinal photocoagulation (PRP), and vitrectomy (Bahr & Bakri, 2023; Raman et al., 2022; Zhao & Singh, 2018; Chatziralli & Loewenstein, 2021; Fallico et al., 2021). A study comparing aflibercept with vitrectomy combined with PRP for diabetic vitreous hemorrhage showed that both approaches can effectively improve vision, with vitrectomy providing faster visual recovery (Ren et al., 2022). The 2024 NICE guidelines provide updated recommendations for the management and monitoring of PDR, emphasizing timely intervention and an individualized treatment approach.

This case report presents a 43-year-old man with bilateral proliferative diabetic retinopathy with vitreous hemorrhage and cataract. This case illustrates the diagnostic challenges, therapeutic considerations, and the importance of comprehensive management in advanced diabetic retinopathy.

CASE REPORT

A 43-year-old man was referred from Sinjai Regional Hospital with a chief complaint of worsening blurred vision over the past three months. The patient described the visual disturbances as seeing black shadows and spots. The patient's right eye was completely blurred, while the left eye remained very blurry. The patient denied redness, pain, watering, a gritty sensation, or glare. The patient had a five-year history of diabetes mellitus treated with insulin. He denied any history of hypertension, asthma, or tuberculosis, and there was no known history of drug allergies.

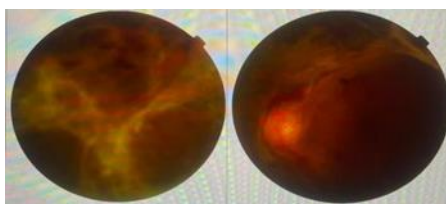


Figure 1. Anterior Segment Examination

On physical examination, the patient appeared moderately ill with *compos mentis* consciousness and stable vital signs: blood pressure 126/81 mmHg, pulse 105 beats per minute, respiratory rate 18 breaths per minute, temperature 36.6°C, and oxygen saturation 98%. General physical examination revealed no significant abnormalities.

Ophthalmologic examination revealed visual acuity of 1/∞ in the right eye and 1/60 in the left eye. Anterior segment examination was within normal limits bilaterally, although lens opacities were present consistent with cataracts. Intraocular pressure was measured at 8 mmHg in the right eye and 10 mmHg in the left eye using an I-Care tonometer. Fundus examination revealed a negative fundus reflex in the right eye and a positive but blurred fundus reflex in the left eye, with the optic disc, cup-disc ratio, retinal vessels, foveal reflex, and peripheral retina difficult to assess due to media opacities. The vitreous had a blackish-red shadow suggestive of vitreous hemorrhage. B-scan ultrasonography showed diffuse internal echoes in the vitreous cavity with spots or clouds of low to moderate reflectivity, consistent with vitreous hemorrhage.



Figure 2. ODS Fundoscopy

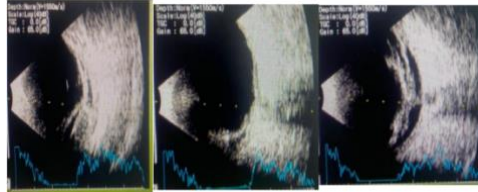


Figure 3. Ultrasound B-Scan ODS

Based on clinical findings and supporting examinations, the diagnosis was bilateral proliferative diabetic retinopathy with vitreous hemorrhage and cataract. Surgical intervention in the left eye was planned, consisting of phacoemulsification with intraocular lens implantation (Rayner 22.0 D IOL), pars plana vitrectomy, endolaser photocoagulation, and gas (SF₆) or silicone (1300) tamponade under general anesthesia. The prognosis was assessed as dubia for survival, function, and recovery.

Discussion

Epidemiology

Diabetic retinopathy remains a significant public health challenge worldwide. Tan and Wong (2023) reported that DR is a significant global health problem and will continue to increase with the diabetes epidemic. Yau et al. (2012) in a global epidemiological study reported that the global prevalence of DR among individuals with diabetes is 34.6%, with PDR affecting 6.96% of the diabetic population. In Asia, approximately 22.3% of diabetic patients experience DR, with NPDR accounting for 19.9% and PDR approximately 2.3%. Yang et al. (2019) reported that in type 2 diabetes patients in Asia, the prevalence of RD was higher at 28%, with NPDR 27% and PDR 6%.

In Indonesia, Sasongko et al. (2020) in the Jogjakarta Eye Diabetic Study in the Community (JOGEDIC) found a prevalence of RD of 43.1% in type 2 diabetes patients aged ≥30 years, with sight-threatening RD in 26.3% of cases (Sasongko et al., 2021). The data also showed that less than 25% of individuals with sight-threatening RD received appropriate treatment in the first 12 months after screening, with the main obstacles being lack of information about treatment costs (88%), permission from family members (77.3%), and the absence of eye complaints (77%).

Pathophysiology

The pathogenesis of PDR is driven by chronic hyperglycemia, which triggers retinal microvascular damage. Shyam et al. (2025) explain that hyperglycemia activates various metabolic pathways that result in oxidative stress and chronic inflammation. Antonetti et al. (2021) outline that the current understanding of the molecular and cellular pathology of PDR includes endothelial cell damage, pericyte loss, and the activation of inflammatory pathways.

Oxidative stress occurs when the production of reactive oxygen species (ROS) exceeds antioxidant capacity, leading to cellular damage and vascular dysfunction (Chaudhary et al., 2023; Dubois-Deruy et al., 2020; Higashi, 2022; Cheng et al., 2022; Camargo et al., 2025). The inflammatory process involves an increase in pro-inflammatory cytokines such as TNF- α , IL-1 β , and IL-6, as well as adhesion molecules that cause leukostasis and capillary occlusion. A study by Hartmane & Mikazans (2025) reported that inflammation is a key feature of PDR and is implicated in dysfunction of the retinal neurovascular unit.

Vascular endothelial growth factor (VEGF) is a key mediator in the development of PDR. Retinal ischemia stimulates excessive VEGF expression, triggering angiogenesis and the formation of fragile new blood vessels. Hartmane and Mikazans (2025) reported that TGF- β 1 is a central regulator of angiogenesis, fibrosis, and inflammation in diabetic retinopathy. TGF- β 1 stimulates VEGF synthesis and activates the NF- κ B signaling pathway, which exacerbates retinal damage.

Diagnosis

Diabetic retinopathy is often asymptomatic in its early stages, making routine screening crucial (Sivaprasad et al., 2025; Wong et al., 2018; Upadhyay et al., 2024; Vujosevic et al., 2020). The American Academy of Ophthalmology (2021) reports that symptoms that appear as the disease progresses include floaters, blurred vision, dark areas in the visual field, and impaired night vision (Lim et al., 2025). Clinical signs of PDR include optic disc neovascularization (NVD), neovascularization elsewhere (NVE), vitreous hemorrhage, and fibrovascular proliferation. In this case, fundus visualization is obstructed by vitreous hemorrhage and cataract, necessitating a B-scan ultrasonography for posterior segment evaluation. A B-scan can detect vitreous hemorrhage, tractional retinal detachment, and fibrovascular proliferation.

Management

Panretinal photocoagulation (PRP) has been the standard treatment for PDR for over four decades, reducing the risk of severe vision loss by approximately 50%. The National Institute for Health and Care Excellence (2024) recommends PRP for PDR, with anti-VEGF therapy as an alternative. According to the 2024 NICE recommendations, vitrectomy is considered for patients with vitreous hemorrhage that does not clear within 3 months, and should be performed within 3 months of the offer.

Intravitreal anti-VEGF agents (ranibizumab, aflibercept, bevacizumab) are the cornerstone of PDR management (Zong et al., 2025; Boey et al., 2025; Arora et al., 2024; Li et al., 2026). The National Institute for Health and Care Excellence (2024) stated that by August 2024, the only licensed anti-VEGF treatment for PDR will be ranibizumab, and the use of other anti-VEGF agents will be off-label. Bressler et al. (2017) in the DRCR Retina Network study reported that in eyes with PDR, ranibizumab resulted in less reduction in PDR progression than PRP. At 2 years, the cumulative probability of worsening PDR was 42% in the PRP group versus 34% in the ranibizumab group. The study also showed that the strongest risk factor for worsening PDR was greater RD severity at baseline. Patients with high-risk PDR had a 64% risk of worsening compared with 23% in moderate or milder PDR. A meta-analysis by the researchers (2025) showed that visual outcomes were better with anti-VEGF than with PRP at 3 and 12 months, and the combination treatment demonstrated better visual outcomes than with PRP at 12 months.

Pars plana vitrectomy is indicated for persistent vitreous hemorrhage, tractional retinal detachment, and a combination of the two (Choovuthayakorn et al., 2019; Bansal et al., 2020; McCullough et al., 2023). Cheung and Borkar (2024) reported the results of the DRCR Retina Network Protocol AB study, which showed that early vitrectomy resulted in faster visual recovery at week 4, especially in patients with baseline vision worse than 20/800. The results showed that the difference in vision between the aflibercept and vitrectomy groups became insignificant at week 12 and continued for up to 2 years. Approximately one in three patients in the early aflibercept group required subsequent vitrectomy. Nawar and Alagorie (2024) in a prospective study of 60 eyes with advanced PDR reported that preoperative Ziv-aflibercept injection significantly reduced operative time (51.67 ± 7.30 minutes vs. 63.17 ± 10.16 minutes) and reduced severe intraoperative bleeding (26.66% vs. 66.66%). This study showed that anti-VEGF preparations facilitate dissection of the fibrovascular membrane and reduce the need for diathermy during surgery. Xu et al. (2024) evaluated the combination of PRP with intravitreal Conbercept injection in 42 patients (74 eyes) with high-risk PDR and moderate vitreous hemorrhage. The results showed complete absorption of the vitreous hemorrhage in all 74 eyes.

within 5–50 weeks of initial treatment, and significant visual improvement in 25 eyes, without serious complications.

Chong et al. (2024) emphasized that internists play an integral role in a multidisciplinary approach to DR, contributing significantly to the management of diabetes and its associated complications through effective screening, timely referral, and strategic diabetes management. Diabetic patients are at higher risk for cataracts. A combined approach of phacoemulsification and vitrectomy is often chosen to reduce complications and allow for better surgical access to the retina.

CONCLUSION

This case report presents a 43-year-old man with bilateral proliferative diabetic retinopathy accompanied by vitreous hemorrhage and cataracts. This case illustrates the sight-threatening nature of PDR and emphasizes the importance of early detection through routine screening in patients with diabetes. The pathophysiology of PDR involves chronic hyperglycemia, oxidative stress, inflammation, and increased VEGF. Management requires a comprehensive approach with glycemic control and timely surgical intervention. Prevention through early detection remains the cornerstone of reducing the global burden of diabetic retinopathy.

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