

# Epiretinal membrane development with internal limiting membrane wrinkling following Nd:YAG laser membranotomy in valsalva retinopathy

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## Introduction

Premacular haemorrhage is an uncommon cause of painless vision loss. Among the causes include valsalva retinopathy, proliferative diabetic retinopathy, vein occlusion, macroaneurysm, hematologic disorders and trauma. The normal fundoscopic appearance is that of a well-circumscribed haemorrhage at the vitreoretinal junction. Blood is thought to build in the potential space under the internal limiting membrane (ILM), particularly in valsalva-related cases, or between the ILM and the hyaloid face. The Valsalva technique involves forced exhalation against a closed glottis, which results in an abrupt increase in venous blood pressure due to an increase in intrathoracic or intraabdominal pressure. A spontaneous rupture of retinal perifoveal capillaries happens as a result of the abrupt increase in intraocular venous pressure, resulting in a sudden, painless loss of vision in an otherwise healthy eye. Although unilateral signs are the most prevalent, it can also appear in both eyes. The haemorrhage usually begins near the macula and, in the great majority of instances, settles on its own without impairing visual acuity. In most cases, it is a solitary and self-limiting occurrence, although even a minor premacular haemorrhage of DD (disc diameter) might take months to heal. The most frequent presenting symptom is impaired vision or a central scotoma, however individuals with a substantial preretinal haemorrhage may present with total visual loss. The reported causes of a Valsalva manoeuvre include straining and physical activities, most commonly during coughing, weight lifting, vomiting, aerobic exercise, sexual activity, end-stage labour, dental procedures, colonoscopy procedures, constipation, blowing musical instruments, and compressive injuries.

The Nd:YAG laser therapy is a non-invasive approach that allows the drainage of substantial premacular subhyaloid haemorrhage into the vitreous, accelerates blood cell absorption, and restores vision within days by clearing the clogged premacular region. There are several reports presenting results of Nd:YAG laser treatment in series of patients with premacular subhyaloid haemorrhage of various etiologies such as Valsalva retinopathy, macroaneurysms, retinal vein occlusions, and diabetic retinopathy, the majority of which have a limited number of selected cases and a short period of follow-up. Due to the lack of any underlying retinal disease, eyes with Valsalva retinopathy fared the best among the other etiologic variables.

The majority of patients with Valsalva retinopathy are young and generally healthy, and they want to be able to work again as soon as possible. In this study, we looked at the efficacy and safety of Nd:YAG laser drainage of premacular subhyaloid haemorrhage caused by Valsalva retinopathy in a private series with a longer follow-up. A premacular subhyaloid haemorrhage causes a rapid and significant loss of eyesight. Among the therapeutic options, Nd:YAG laser hyaloidotomy is a non-invasive approach that allows for quick drainage of the clogged macular region and better vision within days. The purpose of this study was to assess the effectiveness, visual result, and complications associated with Nd:YAG laser hyaloidotomy for premacular subhyaloid haemorrhage. Subhyaloid haemorrhage is a localised vitreous separation from the retina caused by blood buildup. When it occurs in the macular region, it causes a rapid and severe loss of vision. Subhyaloid premacular haemorrhage is distinguished by a confined, spherical or dumbbell-shaped, brilliant red mound of blood underneath the internal limiting membrane (ILM) or between the ILM and hyaloid face, in or near the central macular region. Though spontaneous resolution happens in the majority of instances, it might take several weeks or months depending on the thickness and total volume of blood present, which can be incapacitating to the patient when happening bilaterally or in a one-eyed patient. Furthermore, continuous contact with haemoglobin and iron may cause chronic vision impairment owing to pigmentary macular alterations or the creation of epiretinal membranes, as well as toxic damage to the retina. The majority of patients with Valsalva retinopathy are young and generally healthy, and they want to be able to work again as soon as possible. In this study, we looked at the efficacy and safety of Nd:YAG laser drainage of premacular subhyaloid haemorrhage caused by Valsalva retinopathy in a private series with a longer follow-up.

Long-term consequences of Nd:YAG laser membranotomy include macular hole, retinal detachment, epiretinal membrane development [6], and a permanent premacular hollow. Laser perforations and associated elevations of the ILM normally seal and reconnect within 2–6 months with no notable retinal alterations. In our case, however, there remained a persistent unsealed ILM following Nd:YAG membranotomy. According to OCT tracking, there was no substantial reduction in the size of the ILM perforation or the sub-ILM hyporeflexive space. Several factors may have a role in the occurrence of the problem. First, a big perforating puncture

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of the ILM is undesirable, while a wider incision may allow for better blood drainage into the vitreous. Proliferating cells on the ILM and retinal surface seal the hole. Larger gaps may make it more difficult to create contact between the layers, making it difficult for proliferative cells to close. Second, significant and long-term haemorrhages put the ILM under a lot of strain, causing it to lose its flexibility. When strain remains for an extended length of time, the ILM may degenerate, and cellular proliferation results in the creation of wrinkling. The resulting inflexible tractional membrane is difficult to reconnect to the surface of the retina. Finally, vitreous liquefaction causes fluid accumulation in the sub-ILM space, which impedes membrane apposition and the closure of ILM defects. In our situation, the ILM folds and striae worsened during the duration of the patients' follow-up. The major reason for the patient's poor prognosis was epiretinal membrane (ERM)

production. Kwok and colleagues (2003) described a case of ERM related to Nd:YAG therapy, and our patient had a similar retinal result [6]. ERM development might be triggered by a prolonged unsealed and unreattached ILM membrane. To avoid this problem, the timing of the Nd:YAG laser treatment and the size of the laser aperture are critical considerations. To summarise, Nd:YAG laser puncture of the ILM is a successful technique for Valsalva retinopathy if fast clearing of bleeding is required to restore vision. However, not every patient is a good candidate for laser, and the duration and volume of bleeding may be important considerations. Another critical problem is the power setting necessary to produce an adequate puncture in the ILM. Assessing ILM modifications in the macular area during the follow-up after Nd:YAG laser membranotomy is critical, and the long-term ramifications of an unsealed ILM demand additional research.