

CASE REPORT

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Ipsilateral sub-internal limiting membrane hemorrhage following tympanoplasty: A case report

Farah AlNasser, Lulwah AlMatouq, Aseel AlKandari, Alaa AlAli

ABSTRACT

Introduction: Sub-internal limiting membrane (sub-ILM) hemorrhage is an uncommon cause of acute visual loss caused by blood accumulation beneath the internal limiting membrane. It has been reported in association with retinal vascular disorders or sudden increases in venous pressure. Tympanoplasty is a frequently performed otologic procedure and is generally considered safe; ocular complications following such ear surgeries are rarely reported.

Case Report: A 55-year-old woman underwent tympanoplasty under general anesthesia. Following extubation, the patient reported acute unilateral visual loss immediately after gaining consciousness. Ophthalmic examination revealed a dark coin-shaped premacular hemorrhage resembling sub-ILM hemorrhage in the eye ipsilateral to the operated ear. Findings of multimodal imaging, including optical coherence tomography and fundus autofluorescence, confirmed the diagnosis. The patient was observed without intervention and experienced complete resolution of visual symptoms, with no residual hemorrhage at 3-month follow-up.

Conclusion: We report a case of unilateral sub-ILM hemorrhage occurring shortly after tympanoplasty. Although no established mechanism could be identified, the temporal relationship and ipsilateral presentation

raise the possibility of a localized perioperative contribution. To our knowledge, similar cases have not been reported previously. Ophthalmic evaluation should be considered in patients who develop visual symptoms following otologic surgery.

Keywords: Optical coherence tomography, Postoperative visual loss, Sub-internal limiting membrane hemorrhage, Tympanoplasty

How to cite this article

AlNasser F, AlMatouq L, AlKandari A, AlAli A. Ipsilateral sub-internal limiting membrane hemorrhage following tympanoplasty: A case report. J Case Rep Images Ophthalmol 2026;9(2):6–10.

Article ID: 100055Z17FA2026

doi: 10.5348/100055Z17FA2026CR

INTRODUCTION

Sub-internal limiting membrane (sub-ILM) hemorrhage is an uncommon but well-recognized cause of sudden painless visual loss resulting from blood accumulation in the sub-ILM space. When located over the macula, it may cause significant visual impairment. Clinical presentation varies according to the size and the location of the hemorrhage, with many patients experiencing a sudden reduction in central vision or a central scotoma [1, 2].

Sub-ILM hemorrhage may occur in association with retinal vascular disorders, trauma, or abrupt increases in retinal venous pressure [1, 2]. Activities that produce a sudden increase in intrathoracic and intra-abdominal pressure, such as coughing, vomiting, and strenuous physical exertion, may also result in the occurrence of the hemorrhage [1, 3].

Farah AlNasser¹, MD, Lulwah AlMatouq², MD, Aseel AlKandari³, MD, Alaa AlAli⁴, MD

Affiliations: ¹Assistant in General Surgery, Farwaniyah Hospital, Kuwait; ²Ophthalmologist, AlBahar Eye Center and Farwaniyah Hospital, Kuwait; ³Ophthalmologist, AlBahar Eye Center, Kuwait; ⁴Consultant Ophthalmologist, AlBahar Eye Center, Kuwait.

Corresponding Author: Farah AlNasser, Farwaniyah Hospital, Farwaniyah, Kuwait; Email: ferrah99@hotmail.com

Received: 26 May 2026

Accepted: 04 July 2026

Published: 28 July 2026

Tympanoplasty is an otologic procedure that is commonly performed to restore middle ear function in cases of tympanic membrane perforations. The operation is generally considered safe and associated with a low incidence of major complications. Moreover, ocular complications following otologic surgery are uncommon and have been rarely reported [4].

In this report, we describe a patient who developed sudden unilateral visual loss due to sub-ILM hemorrhage shortly after tympanoplasty performed under general anesthesia. The hemorrhage occurred exclusively in the eye ipsilateral to the operated ear. This case appears to differ from previously described perioperative retinal hemorrhages, which are generally attributed to systemic mechanisms. To our knowledge, similar findings following tympanoplasty have not been previously reported. This report highlights a possible association between otologic surgery and sub-internal limiting membrane hemorrhage and emphasizes the importance of prompt ophthalmologic evaluation in patients presenting with postoperative visual symptoms.

CASE REPORT

A 55-year-old previously healthy woman underwent elective left ear tympanoplasty under general anesthesia. She had no ocular complaints preoperatively and no history of ocular disease, ocular surgery, systemic illness, bleeding disorders, or anticoagulant use. The procedure was reportedly completed without intraoperative complications. Immediately after extubation and while recovering from general anesthesia, she noticed a red spot in her left visual field accompanied by distortion of central vision. Shortly after, the vision in the affected eye deteriorated. Review of the anesthesia and postoperative records subsequently showed that the operation lasted approximately 130 minutes. No episodes of coughing, bucking, or straining during extubation were documented. Intraoperative blood loss was minimal, and no significant anesthetic, surgical, or early postoperative complications were documented.

The patient was assessed soon after symptom onset. Visual acuity measured 20/20 in the right eye and 20/200 in the left eye. External examination showed no abnormalities of the eyelids or conjunctiva. Pupils were equal, round, and reactive to light bilaterally, with no relative afferent pupillary defect. The anterior chambers were deep and quiet in both eyes, and the patient was phakic bilaterally. Intraocular pressure was 18 mmHg in each eye. Dilated fundus examination was unremarkable in the right eye; however, a premacular hemorrhage obscuring the macular details was identified in the left eye.

Additional retinal imaging was performed to further evaluate the lesion. Color fundus photography at presentation demonstrated a well-circumscribed, small, smooth, coin-shaped premacular hemorrhage. Fundus

autofluorescence (FAF) showed a corresponding well-demarcated hypoautofluorescent area at the fovea. Optical coherence tomography (OCT) demonstrated a well-defined, dome-shaped hyperreflective area beneath the internal limiting membrane with posterior shadowing of the deeper retinal layers in the left (affected) eye, consistent with sub-ILM hemorrhage, with a central macular thickness of 386 μm . The right (fellow) eye showed normal retinal architecture (Figure 1).

These findings were consistent with left eye sub-ILM hemorrhage following left ear tympanoplasty. After discussion with the patient, conservative management with close observation was undertaken.

At 12-day follow-up, repeat imaging demonstrated partial resolution of the hemorrhage. Color fundus photography showed a reduction in the size of the sub-ILM hemorrhage at the fovea. FAF demonstrated a reduction in both the size and intensity of the hypoautofluorescent area. OCT showed partial resolution of the hemorrhage with improvement in the foveal contour of the left (affected) eye, and a central macular thickness of 341 μm , whereas the right (fellow) eye remained unremarkable (Figure 2).

At 3-month follow-up, the patient reported complete resolution of visual symptoms. Best-corrected visual acuity was 20/20 in both eyes. Slit-lamp examination was unremarkable bilaterally. Ultra-widefield fundus imaging showed no residual hemorrhage, and OCT demonstrated restoration of normal foveal contour with a central macular thickness of 169 μm (Figure 3).

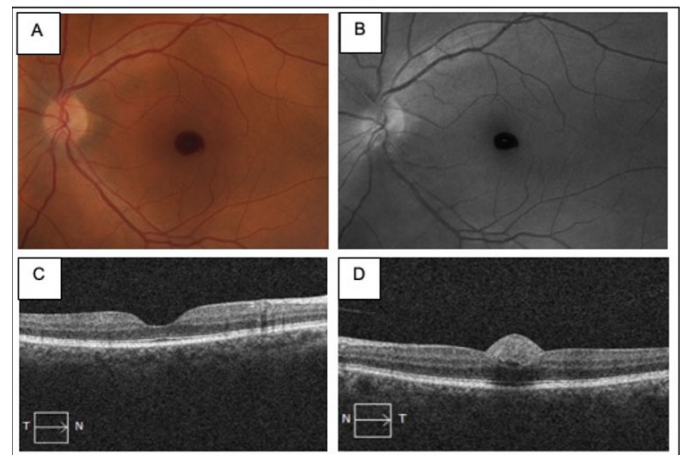


Figure 1: Multimodal imaging at presentation. (A) Color fundus photograph of the left eye demonstrating a well-circumscribed, small, smooth, coin-shaped premacular hemorrhage. (B) Fundus autofluorescence of the left eye showing a corresponding well-demarcated hypoautofluorescent area at the fovea. (C) Optical coherence tomography of the right (fellow) eye showing normal retinal architecture. (D) Optical coherence tomography of the left (affected) eye demonstrating a well-defined, dome-shaped hyperreflective area beneath the internal limiting membrane with posterior shadowing of the deeper retinal layers, consistent with sub-ILM hemorrhage.

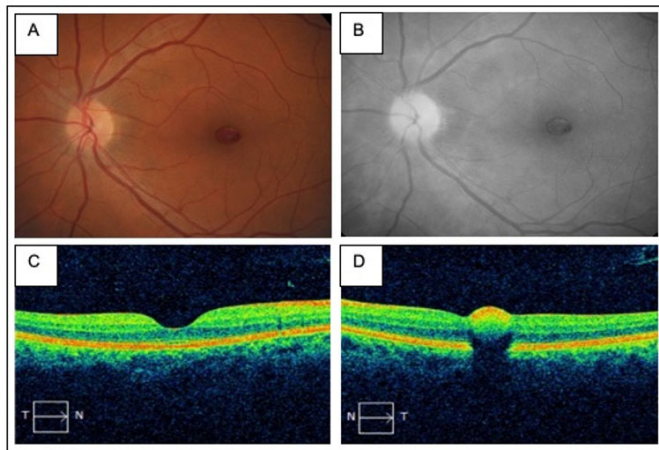


Figure 2: Multimodal imaging at 12-day follow-up. (A) Color fundus photograph of the left eye showing a reduction in the size of the sub-ILM hemorrhage. (B) Fundus autofluorescence of the left eye demonstrating a decrease in the size and intensity of the hypoautofluorescent area. (C) Optical coherence tomography of the right (fellow) eye showing normal retinal architecture. (D) Optical coherence tomography of the left (affected) eye showing partial resolution of the hemorrhage with improved foveal contour.

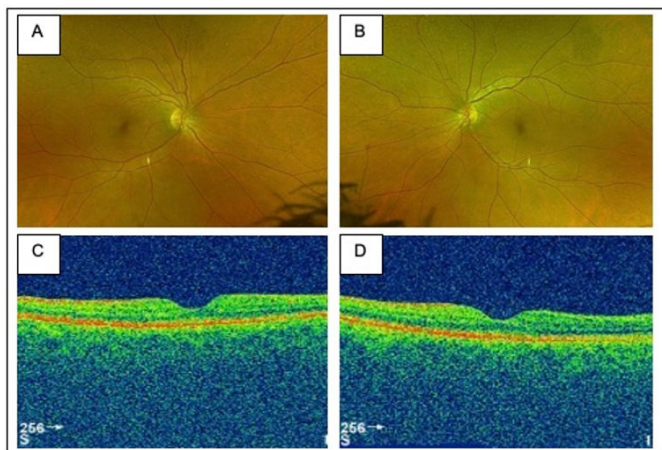


Figure 3: Multimodal imaging at 3-month follow-up. (A) Ultra-widefield color fundus photograph of the right (fellow) eye demonstrating a normal retinal appearance. (B) Ultra-widefield color fundus photograph of the left (affected) eye showing complete resolution of the premacular hemorrhage. (C) Optical coherence tomography of the right (fellow) eye demonstrating normal foveal contour. (D) Optical coherence tomography of the left (affected) eye showing restoration of normal foveal contour without residual hemorrhage.

DISCUSSION

Sub-ILM hemorrhage can lead to acute visual loss when located over the macula due to obstruction of the central visual axis. Several mechanisms have been associated with sub-ILM hemorrhage, most commonly Valsalva retinopathy, in which sudden increases in intrathoracic or intra-abdominal pressure result in elevated retinal venous pressure and rupture of

superficial retinal capillaries. Other recognized causes include Terson syndrome, retinal vascular occlusions, hypertensive retinopathy, hematologic abnormalities, and ocular trauma [1, 2]. Several alternative causes of sub-ILM hemorrhage were considered in this case. Although Valsalva retinopathy is among the most common etiologies, the patient did not report preceding coughing, vomiting, heavy lifting, or similar triggering events [3]. Terson syndrome was felt to be unlikely because there were no neurological symptoms suggestive of intracranial hemorrhage. Clinical examination and multimodal imaging did not suggest retinal arterial macroaneurysm, retinal vascular occlusion, or ocular trauma. The patient also had no known history of hematologic disease, diabetes mellitus, or uncontrolled hypertension that might account for the hemorrhage.

In the absence of other apparent causes, factors related to the perioperative period should also be considered. Airway manipulation, positive-pressure ventilation, coughing, and straining can increase intrathoracic and intra-abdominal pressure and cause fluctuations in venous pressure [1, 2]. These changes may subsequently increase retinal venous pressure and result in retinal hemorrhage. In particular, post-extubation coughing has been recognized as a potential Valsalva-like precipitating factor for sub-ILM hemorrhage [3]. However, these mechanisms are systemic in nature and do not adequately explain the occurrence of hemorrhage exclusively in the eye ipsilateral to the operated ear.

In this context, the findings observed in the present case are of particular interest. Tympanoplasty is generally a safe and commonly performed otologic procedure associated with a low incidence of major complications, and ocular complications following such ear surgeries are rarely reported [4]. A literature search of PubMed and Google Scholar using combinations of the terms “tympanoplasty,” “middle ear surgery,” “sub-internal limiting membrane hemorrhage,” “sub-ILM hemorrhage,” “premacular hemorrhage,” and “retinal hemorrhage” did not identify any published reports of sub-ILM hemorrhage following tympanoplasty. To the best of our knowledge, this appears to be the first reported case in the published literature.

Review of the anesthesia, operative, and recovery records did not identify any documented perioperative event or complication that could explain the retinal hemorrhage. In previously reported cases, perioperative retinal hemorrhage has been attributed primarily to systemic hemodynamic or Valsalva-like mechanisms rather than localized surgical factors. The ipsilateral presentation of the hemorrhage is not readily explained by the proposed systemic mechanisms. Localized venous congestion associated with surgical positioning, asymmetric transmission of pressure changes, and individual retinal vascular susceptibility are among the possible contributing factors. Nevertheless, a definitive causal relationship cannot be established and a coincidental occurrence cannot be excluded.

Middle ear packing during tympanoplasty is another possible contributing factor that is worth considering. In the present case, Gelfoam packing was placed within the middle ear cavity as part of the standard surgical technique. Temporary Eustachian tube obstruction or dysfunction may impair pressure equalization and alter pressure dynamics within the middle ear [5]. These pressure changes may extend beyond the middle ear and affect nearby venous drainage, with secondary effects on retinal venous circulation. At present, however, there is little evidence to support this explanation in the literature.

In clinical practice, treatment of sub-ILM hemorrhage is individualized. The choice of treatment depends on hemorrhage size, lesion location, presenting visual symptoms, and the underlying cause. Small and moderate hemorrhages usually resolve spontaneously with observation alone, but surgical intervention may be required in selected cases, especially when persistent blood over the macula results in potential toxicity to retinal layers. Intervention with Nd:YAG hyaloidotomy, pars plana vitrectomy, or pneumatic displacement is reserved for larger hemorrhages that cause persistent visual impairment [6]. In the present case, conservative management was associated with complete resolution of the hemorrhage and recovery of visual acuity at 3-month follow-up.

This report has several limitations. As a single case report, it does not allow a causal relationship between tympanoplasty and sub-ILM hemorrhage to be established. In addition, no direct measurements were available to investigate the proposed mechanism. Although the anesthesia, operative, and postoperative records were reviewed, no data were available regarding retinal venous pressure or other physiological changes that may have contributed to the hemorrhage. On this basis, the mechanism responsible for the hemorrhage could not be determined.

CONCLUSION

We report a case of unilateral sub-ILM hemorrhage that developed shortly after tympanoplasty. No established mechanism could be identified, although the timing of symptom onset and the ipsilateral location of the hemorrhage raise the possibility of a localized perioperative contribution. To our knowledge, similar cases have not been reported previously. Clinicians should consider ophthalmic evaluation in patients who develop visual symptoms following otologic surgery.

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Author Contributions

Farah AlNasser – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Lulwah AlMatouq – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Aseel AlKandari – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Alaa AlAli – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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