

## CASE REPORT

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# Acute macular neuroretinopathy in a second-trimester pregnant patient: A case report and literature review

Noor AlAli, Daniah AlBaloul, Ali Shamsah, Aseel AlKandari, Alaa AlAli

## ABSTRACT

This case report presents a rare occurrence of acute macular neuroretinopathy in a 24-year-old healthy woman, who is a primigravida in her second trimester. She presented with a sudden onset of paracentral vision loss in the oculus sinister. A fundus examination showed a parafoveal wedge-shaped brown-red lesion in the macula. An optical coherence tomography scan showed abnormal hyperreflectivity in both the outer plexiform and outer nuclear layers with ellipsoid zone disruption. Conservative management was recommended, and the patient was followed up one month later with an improvement in her paracentral vision loss but with new onset metamorphopsia. Repeat optical coherence tomography showed complete resolution of the hyperreflectivity in the outer retina layers with persistent disruption of the ellipsoid zone in the subfoveal area in the oculus sinister. In this case report, we present acute macular neuroretinopathy in an antepartum patient, accompanied by a literature review, highlighting pregnancy and its hypercoagulable state as a potential contributor to this condition.

**Keywords:** Acute macular neuroretinopathy, Ellipsoid zone, Metamorphopsia, Optical coherence tomography, Outer nuclear layer, Outer plexiform later, Paracentral vision loss

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## INTRODUCTION

Acute macular neuroretinopathy (AMN) is a rare retinal disorder that manifests as a sudden onset of a paracentral scotoma, and appears as reddish-brown, wedge-shaped lesions in the macula pointing toward the fovea [1]. It classically affects the outer retina, particularly the outer nuclear layer (ONL) and the ellipsoid zone (EZ) [2–4]. Acute macular neuroretinopathy was first described by Bos and Deutman in 1975, who observed four female patients who presented with paracentral scotomas and, after a thorough examination and conducting a series of imaging studies, including fundus photography, fluorescein angiography, and visual field tests, they identified that all patients had these characteristic macular lesions [1]. The pathophysiology of AMN remains poorly understood but microvascular compromise at the level of the deep capillary plexus (DCP) of the retina is a widely proposed theory [2, 5]. However, more recently, a new theory regarding the mechanism of AMN is emerging which involves primary ischemia of the choriocapillaris causing hypoxia and injury in the outer retinal region [6, 7]. Acute macular neuroretinopathy typically manifests in young female patients, although several cases have been reported in males [2].

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Associated factors for the development of AMN include infection or febrile illness (e.g., upper respiratory tract infections, enteritis), oral contraceptive pill use, hypotension or dehydration, intravenous contrast administration, sympathomimetic use, and hypercoagulable states [2]. Recent literature also reports an association between AMN and COVID-19 infection [8, 9], as well as COVID-19 vaccinations [10, 11]. An underlying vascular pathology appears to be the common link among these risk factors.

Given its close relationship to AMN in terms of its pathophysiology, paracentral acute middle maculopathy (PAMM) was first described by Sarraf et al. in 2013 as a variant of AMN that primarily affects the inner retina, presenting as hyperreflective changes in the inner nuclear layer (INL) on optical coherence tomography (OCT). Although AMN mainly affects the outer retina [5], clinically, both entities share a similar presentation and fall under the retinal ischemic spectrum. While microvascular insult is likely the hypothesized trigger for both conditions, the site of ischemia differs between them, with AMN involving the outer retinal capillary plexuses, and PAMM involving the intermediate and deep capillary plexuses [5].

This report describes a rare presentation of a 24-year-old female patient who is a primigravida in her second trimester with a sudden onset of paracentral scotoma in her oculus sinister (OS). Her clinical and imaging examinations confirmed the diagnosis of AMN. While many cases of AMN have been reported in the postpartum period, there are scarce reports of AMN in the antepartum period. Herein, we emphasize the importance of considering retinal ischemic disorders in pregnant females presenting with acute visual disturbances.

## CASE REPORT

A healthy primigravida, in her early twenties, presented to the emergency department with a 5-day history of paracentral vision loss in the OS described as a small, round gray spot near the center of vision. The onset was acute and painless. The OS scotoma has persisted since its onset with no diurnal variation. The patient reported no floaters, photopsia, redness, or other visual changes. She denied any recent flu-like symptoms or signs of infection. Her last vaccination was the Pfizer COVID-19 vaccine, received as a two-dose series in 2022. Furthermore, the patient denied any episodes of hypotension.

Regarding medications, the patient reported no regular medication use, except for folic acid supplementation during pregnancy. She denied the use of any oral contraceptive pills prior to her pregnancy. At the time of presentation, the patient was 13 + 2 weeks pregnant, with no relevant obstetric complications, except for mild pregnancy-related nausea and vomiting. She has no previous ophthalmic history. Personal and family histories of autoimmune and thrombotic disorders were excluded.

On examination, best-corrected visual acuity (BCVA) was 20/20 in the oculus dexter (OD) and 20/25 in the OS. The slit lamp examination (SLE) of the anterior segment was unremarkable. Pupils were round, regular, and reactive to light bilaterally. Intraocular pressure (IOP) was also within normal limits in both eyes. Amsler grid testing revealed a paracentral dark spot in the OS pointing toward the fixation point (Figure 1). Dilated fundus examination revealed a parafoveal wedge-shaped brown-red lesion in the OS (Figure 2B), while the OD was completely normal (Figure 2A), and fundus autofluorescence (FAF) showed corresponding hyperautofluorescence in the OS (Figure 2D). An OCT was obtained, which showed OPL and ONL abnormal hyperreflectivity with disruption of the EZ in the LE (Figure 3B), whereas OCT of the OD appeared unremarkable (Figure 3A). Optical coherence tomography angiography (OCTA) was also done, revealing DCP flow voids in the OS (Figure 3F) with preserved flow in the superficial plexus (Figure 3C and D). The 10-2 visual field test demonstrated a paracentral scotoma matching the lesion location in the OS (Figure 4A) and was unremarkable in the OD (Figure 4B).

Upon reviewing the patient's vital signs and most recent laboratory tests, all were within normal limits. The patient agreed to observational management, and we scheduled a follow-up after one month.

At one month follow-up, she reported that the paracentral scotoma was still persistent, but with less intensity, as well as a new onset of metamorphopsia, as manifested on Amsler grid (Figure 5). She was otherwise well with no other new complaints. Her BCVA was the same as the previous visit, remaining 20/20 in her OD and 20/25 in her OS, and IOP was 15 mmHg in both eyes. The OCT was also repeated at this visit and showed complete resolution of the hyperreflectivity in the outer retinal layers with persistent disruption of the EZ in the OS (Figure 6).

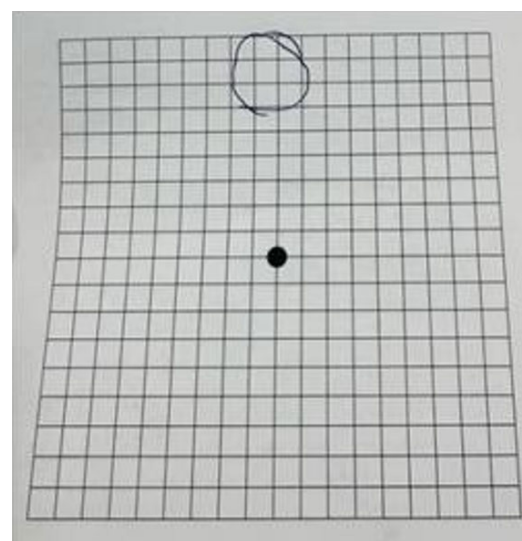


Figure 1: Initial Amsler grid examination: patient's drawing of scotoma at presentation in the OS.

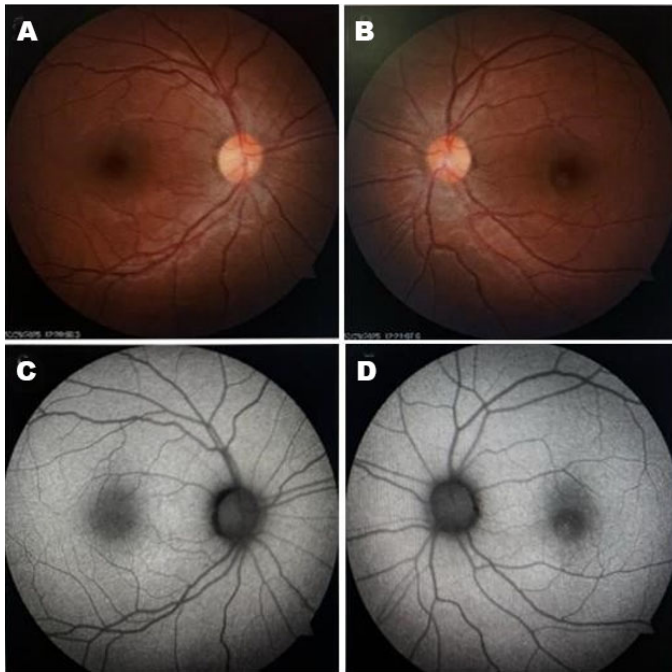


Figure 2: (A) Normal fundus photo of the OD. (B) Fundus photo revealing parafoveal wedge-shaped brown-red lesion in the OS. (C) Normal fundus autofluorescence of the OD. (D) Fundus autofluorescence of the OS showing a subtle relatively hyperautofluorescent area surrounding and adjacent to the foveal center, corresponding to the brown-red wedge-shaped lesion in B.

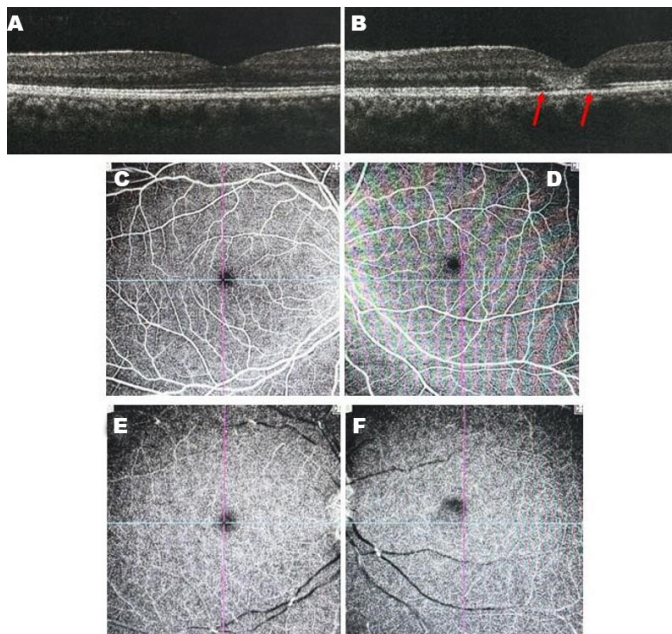


Figure 3: (A) Optical coherence tomography of the OD. (B) Optical coherence tomography of the OS showing attenuation in the ellipsoid zone (arrows). (C, D) Optical coherence tomography angiography (OCTA) of the superficial plexus is normal in both eyes. (E) OCTA showing normal flow in deep plexus of the OD. (F) Flow void areas are seen in the deep plexus on OCTA of the OS.

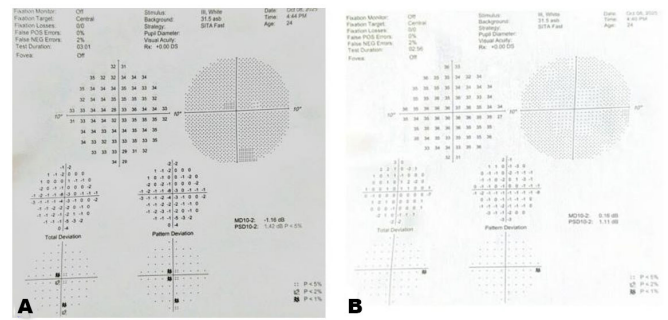


Figure 4: (A) 10-2 visual field demonstrating a paracentral scotoma in the OS. (B) Normal visual field in the OD.

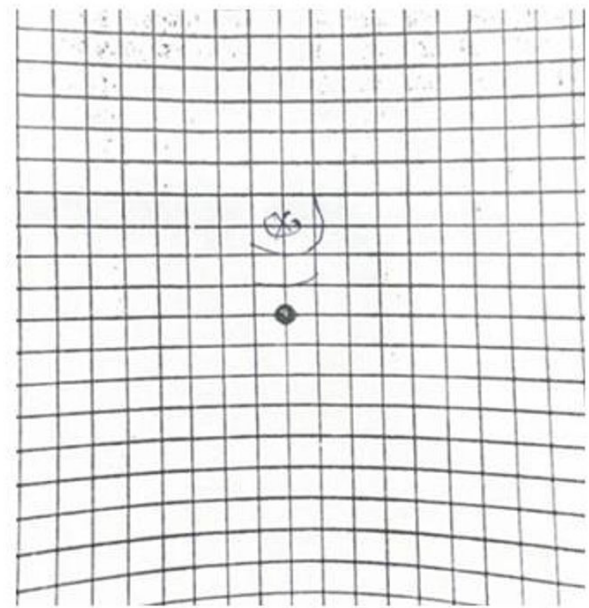


Figure 5: Patient's drawing on Amsler grid after one month follow-up, complaining of seeing the lines bent (metamorphopsia) with improvement in her scotoma.

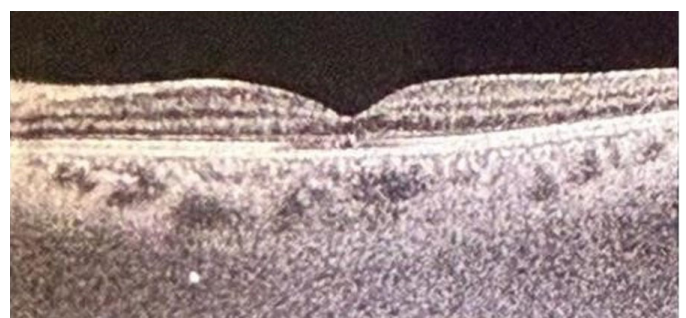


Figure 6: Optical coherence tomography of the OS after one month follow-up showing disruption of the EZ.

## DISCUSSION

Acute macular neuroretinopathy is an uncommon retinal condition, which predominantly affects females in their reproductive years [2]. It classically manifests

as a sudden onset of paracentral scotomas, which can be bilateral in some cases [2]. Wedge-shaped parafoveal lesions on fundus examination, in addition to hyperreflectivity of the ONL and disruption of the EZ on OCT, are typical findings [1–4]. It can also present with decreased vision, blurry vision, floaters, and metamorphopsia, but these are rare manifestations of AMN [2]. It is imperative to note that most documented cases of AMN occurrence and visual deficit were reported in the peripartum and postpartum periods [12–15], whereas presentation of the condition in the antepartum period is exceptionally rare [16, 17]. To our knowledge, most published cases of AMN in pregnancy are related to the peripartum or postpartum period and are frequently a result of complications such as pre-eclampsia [12] or excessive blood loss during delivery leading to hypotension or the use of vasoconstrictive agents like ergotamine [13]. In light of the above, antepartum AMN cases are scarcely reported in the literature, thus adding novelty to our case report.

The pathophysiology of AMN is likely multifactorial and complex and is thought to be of vascular origin, especially after taking into consideration all the listed triggering factors of the condition. It is believed that AMN involves an ischemic insult at the level of the DCP [2, 5], and this hypothesis was supported by Sarraf et al. in 2013 when they first introduced PAMM as a variant of AMN which causes vascular ischemia at the level of the intermediate and DCP [5]. Paracentral acute middle maculopathy usually manifests as hyperreflectivity in the INL, which may, over time, cause INL thinning and atrophy [5]. The recognition and detailed description of PAMM aided in understanding AMN and relating the two conditions together under the same umbrella of retinal ischemia.

Lately, however, a shift has occurred and several studies that analyzed cases of AMN found isolated choroidal perfusion deficits on OCTA, rather than deficits in the DCP [6, 7, 18]. In these cases, OCTA showed choriocapillaris flow deficits that closely corresponded to the location and configuration of AMN lesions, with no abnormalities in the DCP, suggesting that hypoperfusion of the inner choroid may play a primary role in the outer retinal changes in AMN. A combined DCP and choriocapillaris insult has also been proposed as a possible theory, implying a dual-watershed zone between the DCP and the choriocapillaris that is highly susceptible to hypoperfusion [19].

In our patient, two factors in her presentation may have predisposed her to the development of AMN. Pregnancy, in general, is often considered to be a hypercoagulable state due to fluctuations in maternal hormones and an increase in procoagulant activity, which in turn affects hemodynamics and vascular reactivity [20, 21]. This ultimately increases the susceptibility to ischemia, which affects highly vascularized tissues, and this inevitably includes the retina. The second factor in our patient might be related to her vomiting episodes,

as she stated increasing nausea at the same time of visual symptoms onset. However, this factor is likely insignificant, as the patient mentioned a maximum of two episodes of vomiting per day and was otherwise well and did not have any symptoms of hypotension or syncope. This emphasizes how pregnancy is potentially the provoking factor in our case, and upon reviewing the literature, a few case reports of PAMM and AMN have demonstrated pregnancy as a trigger independent of any systemic disease or delivery-related complications [16].

It is essential to note that during pregnancy, a number of other conditions that pose a risk to vision can arise, and can be considered as differential diagnoses. Pre-eclampsia, identified as new onset of hypertension beyond 20 weeks of gestation with the presence of proteinuria independently or accompanied by end-organ dysfunction of the central nervous system, thrombocytopenia, impaired liver function, impaired renal function or pulmonary edema. It can also progress to eclampsia or hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome. Central nervous system dysfunction can present as visual changes, mostly triggered by retinal arteriole narrowing due to elevated systemic hypertension, leading to ischemia and damage to retinal vessels. As a result, hypertensive retinopathy, serous retinal detachment, cortical blindness, optic nerve ischemia and retinal vascular occlusions occur [22]. Another cause of vision loss during pregnancy is central serous chorioretinopathy (CSC), which is a result of increased choroidal capillary permeability and retinal pigment epithelium (RPE) dysfunction, causing serous neurosensory retinal detachment. Central serous chorioretinopathy can present as reduced visual acuity, central scotoma, deficits in color vision, as well as metamorphopsia [23, 24]. Pregnancy is considered a risk factor for the development of CSC, and theories regarding its development are related to choroidal perfusion alterations, which, as mentioned previously, pregnancy can trigger with respect to hemodynamics and vascular activity [21, 23]. Finally, idiopathic intracranial hypertension (IIH) is a condition of elevated intracranial pressure without an identifiable cause; however, one theory presumes its association with periods of hormonal shifts such as pregnancy and menopause [25]. Ophthalmological symptoms of IIH include visual disturbances such as reduced vision and horizontal diplopia caused by either unilateral or bilateral abducens (Cranial nerve 6) palsy, with the possibility of visualizing papilledema upon funduscopic examination as a finding of elevated intracranial pressure [25]. The final diagnosis of AMN was established by systematically excluding pregnancy-related conditions, such as pre-eclampsia, eclampsia, and HELLP syndrome. Central serous chorioretinopathy was ruled out due to the absence of serous retinal detachment or subretinal material upon examination. Furthermore, CSC findings of hypoautofluorescence correlating with the detachment site on FAF and OCTA findings of focal areas of flow impairment within the choriocapillaris

or dilation underneath areas where dysfunction of the RPE and neurosensory detachment occur, were not exhibited in our patient. The absence of papilledema on dilated funduscopy also ruled out IIH. Comprehensive multimodality imaging, including OCT, OCTA, and FAF confirmed findings consistent with AMN.

Treatment options for AMN are largely supportive, as there is no clearly established therapeutic measures. Some cases of PAMM and AMN were treated with corticosteroids; however, the results were variable and inconsistent, with some cases showing improvement whereas others did not [26, 27]. The mainstay management of AMN typically involves observation and addressing any potential underlying factors [28]. In pregnant patients, treatment is further limited by safety concerns, and most reported cases—including ours—were managed conservatively without any pharmacologic intervention. Visual prognosis is often favorable with partial or complete recovery of visual acuity over weeks to months; however, paracentral scotomas may persist in some cases [2]. Furthermore, a limitation of this case is the lack of an extended follow-up beyond the one-month period, as the patient felt well and declined further visits given that her residual symptoms were mild and non-debilitating.

## CONCLUSION

In conclusion, this case highlights AMN in early pregnancy, which is considered an extremely rare occurrence in literature, emphasizing the need to keep in mind retinal ischemic-like disorders as differential diagnoses in pregnant patients presenting with acute vision loss. The lack of systemic disease as well as hemodynamic instability in our patient suggests that pregnancy alone can be a potentially contributing factor to the pathogenesis of AMN. Observation and follow-up of all patients with AMN are recommended and are helpful in determining the course of the disease and offering appropriate counseling.

## REFERENCES

1. Bos PJ, Deutman AF. Acute macular neuroretinopathy. *Am J Ophthalmol* 1975;80(4):573–84.
2. Bhavsar KV, Lin S, Rahimy E, Joseph A, Freund KB, Sarraf D, et al. Acute macular neuroretinopathy: A comprehensive review of the literature. *Surv Ophthalmol* 2016;61(5):538–65.
3. Feigl B, Haas A. Optical coherence tomography (OCT) in acute macular neuroretinopathy. *Acta Ophthalmol Scand* 2000;78(6):714–6.
4. Fawzi AA, Pappuru RR, Sarraf D, Le PP, McCannel CA, Sobrin L, et al. Acute macular neuroretinopathy: Long-term insights revealed by multimodal imaging. *Retina* 2012;32(8):1500–13.
5. Sarraf D, Rahimy E, Fawzi AA, Sohn E, Barbazetto I, Zacks DN, et al. Paracentral acute middle maculopathy: A new variant of acute macular

- neuroretinopathy associated with retinal capillary ischemia. *JAMA Ophthalmol* 2013;131(10):1275–87.
6. Lee SY, Cheng JL, Gehrs KM, Folk JC, Sohn EH, Russell SR, et al. Choroidal features of acute macular neuroretinopathy via optical coherence tomography angiography and correlation with serial multimodal imaging. *JAMA Ophthalmol* 2017;135(11):1177–83.
7. von der Burchard C, Gruben A, Roider J. Optical coherence tomography angiography suggests choriocapillaris perfusion deficit as etiology of acute macular neuroretinopathy. *Graefes Arch Clin Exp Ophthalmol* 2024;262(8):2471–9.
8. Virgo J, Mohamed M. Paracentral acute middle maculopathy and acute macular neuroretinopathy following SARS-CoV-2 infection. *Eye (Lond)* 2020;34(12):2352–3.
9. Gascon P, Briantais A, Bertrand E, Ramtohl P, Comet A, Beylerian M, et al. COVID-19 associated retinopathy: A case report. *Ocular Immunology and Inflammation* 2020;28(8):1293–7.
10. Böhler AD, Strøm ME, Sandvig KU, Moe MC, Jørstad ØK. Acute macular neuroretinopathy following COVID-19 vaccination. *Eye (Lond)* 2022;36(3):644–5.
11. Wang S, Wang J, Hu J, Wang N. Retinal microvascular impairment in COVID-19 patients: A meta-analysis. *Immun Inflamm Dis* 2022;10(6):e619.
12. Chen YC, Chen SN. Microvascular change in acute macular neuroretinopathy by using optical coherence tomography angiography. *Taiwan J Ophthalmol* 2019;9(2):118–21.
13. Hann FT, Anis M, Diané S, Diané MH. Acute macular neuroretinopathy (AMN) following Ergotamine intake in the postpartum period: A case report from Conakry's Medical Ophthalmologic Center. *The Open Ophthalmology Journal* 2023;17:e18743641273314.
14. Ranjan P, Hansraj S. Bilateral acute macular neuroretinopathy in a postpartum, otherwise healthy female: A case report. *Indian J Ophthalmol* 2012;60(4):313–5.
15. Rauegger T, Blatsios G, Haas G, Putz G, Zehetner C. C-shaped scotoma after complicated cesarean section: A case of acute macular neuroretinopathy. *Case Rep Ophthalmol* 2019;10(3):391–6.
16. The Case of the Pregnant Woman With a Visual Disturbance. *AAO Morning Rounds*. 2016. [Available at: <https://www.aao.org/eyenet/article/pregnant-woman-with-blurry-vision>]
17. Pecan PE, Smith AG, Ehlers JP. Optical coherence tomography angiography of acute macular neuroretinopathy and paracentral acute middle maculopathy. *JAMA Ophthalmol* 2015;133(12):1478–80.
18. Thanos A, Faia LJ, Yonekawa Y, Randhawa S. Optical coherence tomographic angiography in acute macular neuroretinopathy. *JAMA Ophthalmol* 2016;134(11):1310–4.
19. Duan J, An J, Li M, Zhang Z, Zhou L, Yin P, et al. Topographical relationship between acute macular neuroretinopathy and choroidal watershed zone or patchy choroidal filling. *Front Med (Lausanne)* 2022;9:762609.
20. Chen X, Desai SJ, Bauman CR. Paracentral acute middle maculopathy in pregnancy. *Retin Cases Brief Rep* 2020;14(3):221–3.

21. Brenner B. Haemostatic changes in pregnancy. *Thromb Res* 2004;114(5–6):409–14.
22. Abu Samra K. The eye and visual system in the preeclampsia/eclampsia syndrome: What to expect? *Saudi J Ophthalmol* 2013;27(1):51–3.
23. Ochinciuc R, Munteanu M, Baltă G, Baltă F. Central serous chorioretinopathy in pregnancy. *Rom J Ophthalmol* 2022;66(4):382–5.
24. Manayath GJ, Ranjan R, Shah VS, Karandikar SS, Saravanan VR, Narendran V. Central serous chorioretinopathy: Current update on pathophysiology and multimodal imaging. *Oman J Ophthalmol* 2018;11(2):103–12.
25. Toshniwal SS, Kinkar J, Chadha Y, Khurana K, Reddy H, Kadam A, et al. Navigating the enigma: A comprehensive review of idiopathic intracranial hypertension. *Cureus* 2024;16(3):e56256.
26. Fekri S, Khorshidifar M, Dehghani MS, Nouri H, Abtahi SH. Acute macular neuroretinopathy and COVID-19 vaccination: Case report and literature review. *J Fr Ophtalmol* 2023;46(1):72–82.
27. Hoang A, Khine KT, Houghton OM. Recurrence of acute macular neuroretinopathy. *Ophthalmic Surg Lasers Imaging Retina* 2018;49(12):962–8.
28. Zubricky R, Ensor W. Acute macular neuroretinopathy following COVID-19 infection: A case report. *Cureus* 2025;17(1):e78182.

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## Author Contributions

Noor 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

Daniah AlBaloul – 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

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## Guarantor of Submission

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## 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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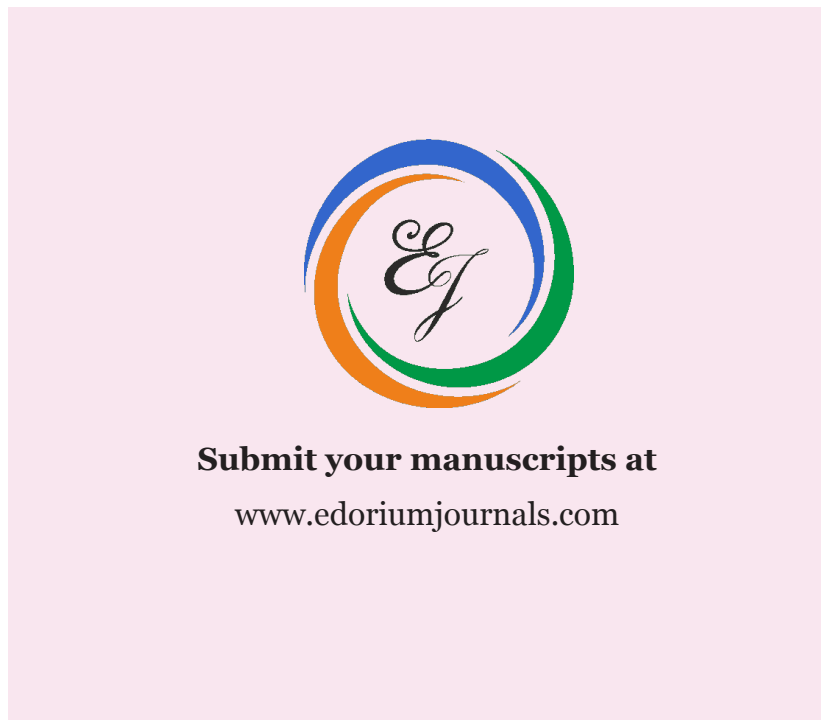
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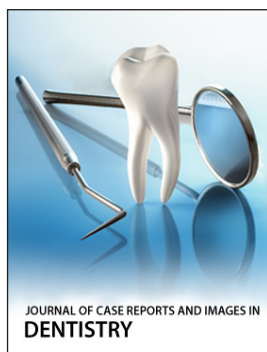
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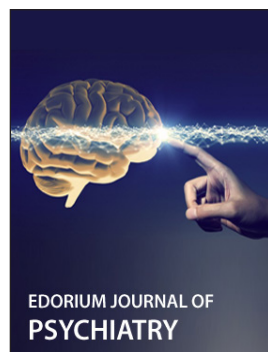
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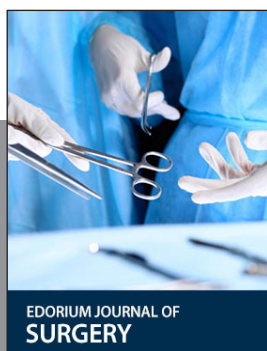
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