

Macular hole after successful pneumatic retinopexy



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ABSTRACT

Pneumatic retinopexy has become widely recognized as an effective approach for treating certain types of retinal detachments. However, the occurrence of a macular hole following pneumatic retinopexy is rare, affecting 0.3% of cases. This case highlights the early development of macular hole following an initially successful Pneumatic retinopexy. A 55-year-old male presented with a decrease in visual acuity in his right eye for one week. Examination revealed retinal detachment, with a single horseshoe tear located at 10 o'clock position in the right eye. The patient underwent pneumatic retinopexy, which involved cryoretinopexy and an intravitreal injection of sulfur hexafluoride. Initially, complete reattachment of the retina was achieved. Two weeks later, the patient reported a central scotoma with a reduction in visual acuity. Optical coherence tomography identified a new macular hole. This case emphasizes the potential for rare complications associated with pneumatic retinopexy, which are typically attributed to persistent vitreous traction.

Key Words: Pneumatic Retinopexy; Macular Hole; Retinal Detachment; Cryo-retinopexy; Vitreous Traction.

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INTRODUCTION

Pneumatic retinopexy has become widely recognized as an effective approach for treating selected cases of retinal detachments, with a reported success rate of 68.5% after a single procedure.¹ Despite its effectiveness, the main causes of failure include proliferative vitreoretinopathy and the occurrence of new or missed retinal breaks.² Occurrence of a macular hole following pneumatic retinopexy is rare, with an incidence of 0.3% or less. The following case illustrates early onset of a macular hole after a successful pneumatic retinopexy.^{3,4}

CASE DESCRIPTION

A 55-year-old male presented to the Hassan II University Hospital of Fez with a one-week history of

sudden decreased visual acuity in his right eye. His visual acuity was 1 LogMAR in the right eye and 0.1 LogMAR in the left eye. There was retinal detachment from 9 to 1 o'clock, with a single horseshoe tear located at the 10 o'clock position (Figure 1). A meticulous biomicroscopic assessment confirmed that the macula appeared normal, with no evidence of a macular hole, and no Weiss ring was detected.

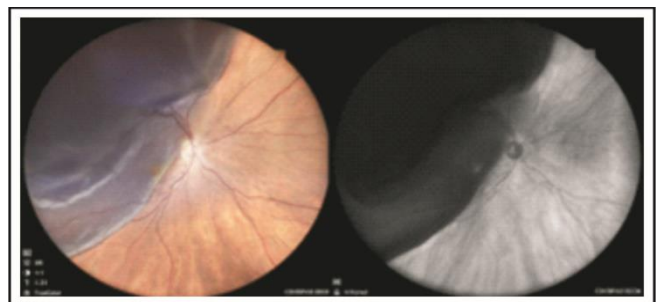


Figure 1: A color fundus and infrared image revealed a bullous retinal detachment in the right eye. The macula appeared normal, with no evidence of a macular hole.

The patient opted for pneumatic retinopexy, which was performed the same day. The procedure involved

cryo-retinopexy to address the retinal tear, followed by paracentesis and the intravitreal injection of 0.5 mL of 100% sulfur hexafluoride. The Steamroller maneuver was employed to reduce subretinal fluid. Following the procedure, the patient was positioned appropriately to promote optimal healing.

One week after the procedure, complete retinal reattachment was observed, and the macula appeared flat with no residual fluid. Visual acuity had improved to 0.2 LogMAR (Figure 2).

Two weeks later, the patient returned, reporting a small central scotoma and a reduction in visual acuity to 0.7 LogMAR. Clinical examination, along with optical coherence tomography, identified a new macular hole measuring 469 μm (Figure 3). Despite this complication, the retina remained attached, and the superior retinal tear was securely sealed by the cryotherapy, with no additional retinal breaks detected. The patient opted for vitreoretinal surgery.

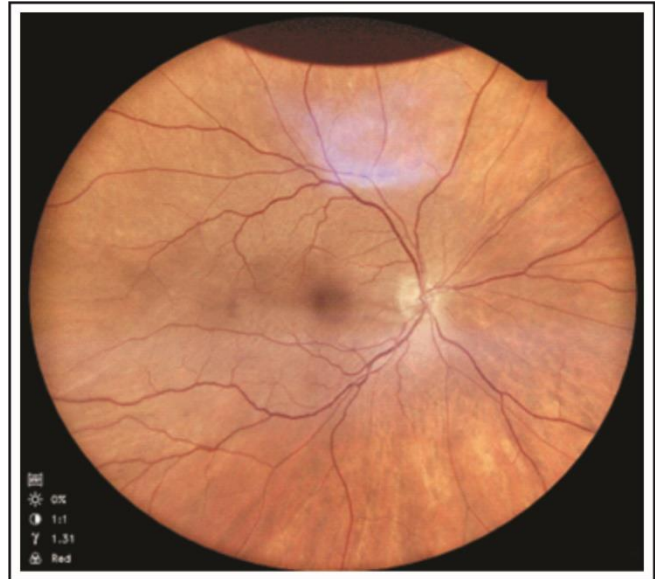


Figure 2: One week postoperatively, a color fundus examination revealed complete retinal reattachment. The macula appeared flat, with no detectable residual fluid.

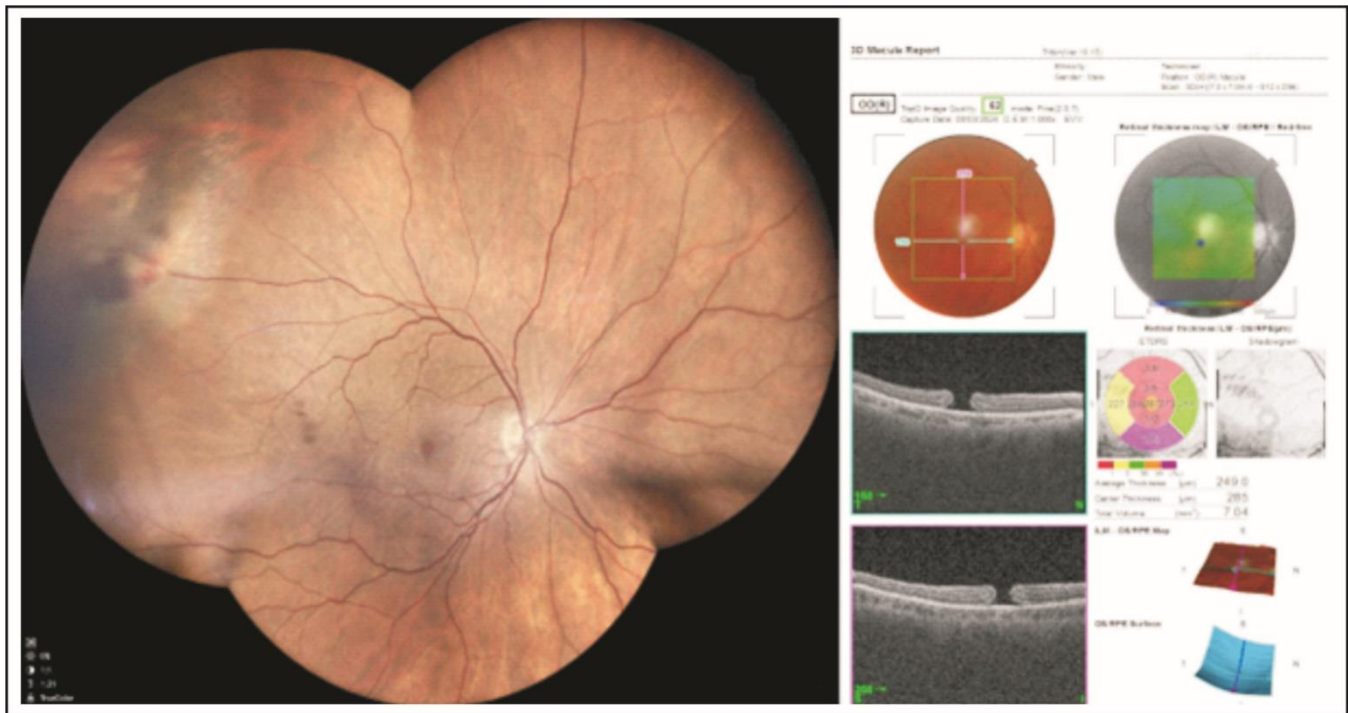


Figure 3: A color fundus and optical coherence tomography revealed a new full-thickness macular hole measuring 469 μm . The retina in the right eye remained flat, with the superior retinal tear effectively sealed by the cryotherapy.

DISCUSSION

Pneumatic retinopexy using expandable gas is becoming an increasingly preferred method for treating superior rhegmatogenous retinal detachments. Although this technique is gaining popularity, it is not

without its complications.² Recently, we encountered a case in which a macular hole developed soon after the intraocular injection of sulfur hexafluoride. This case underscores the possibility of rare complications associated with pneumatic retinopexy, often linked to

persistent vitreous traction.⁵

New retinal breaks are observed in approximately 10% of cases after repair of an initial spontaneous break. In 70% of these instances, the new breaks develop within 60° of the original sites and are most commonly detected within three months post-surgery, with a 95% occurrence rate.⁶ However, when these breaks emerge just a few days after the gas injection and are situated far from the original site, it suggests that an alternative underlying mechanism may be at play.

Macular holes have been documented in 1% to 2% of cases.⁷ However, there is no current evidence to suggest a higher incidence of macular holes following pneumatic retinopexy. Complex changes in the vitreoretinal interface associated with vitreous separation likely contribute to macular hole development. The presence of large gas bubbles in non-vitreotomized eyes can exacerbate remote tractional problems through vitreous displacement, accelerated syneresis, or preretinal membrane formation.⁸ In this particular case, there are other potential mechanisms that could explain the development of the macular hole. Firstly, it is conceivable that vitreous traction on the macula was induced as the gas tracked between the retina and the posterior vitreous face, ultimately leading to hole formation. Secondly, although less likely, the large amount of subretinal fluid might have prompted macular re-detachment, imposing undue stress on its delicate structure and subsequently resulting in hole formation.⁵

For suitable candidates, pneumatic retinopexy provides a less invasive and more cost-effective option for repairing retinal detachment. It allows for quicker recovery and avoids the need for operating room procedures and the risks associated with anesthesia, though it does have slightly lower primary reattachment rates.⁹ Despite these advantages, complications such as macular holes have been reported. To mitigate this risk, a meticulous assessment of the posterior vitreomacular interface before treatment is recommended. This reduces the risk of introducing gas into the space between the retina and the adherent posterior vitreous face in patients with vitreous adhesion to the macula.⁵ If a macular hole develops, it can be effectively managed with vitrectomy, long-acting gas tamponade and various adjuvant therapies, potentially leading to a good visual outcome.¹⁰

CONCLUSION

Pneumatic retinopexy is associated with potential sight-threatening complications. The occurrence of a macular hole following this procedure, though rarely documented, is particularly devastating as it can lead to permanent impairment of central visual acuity.

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Conflict of Interest: Authors declared no conflict of interest.

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