

SUPPLEMENTARY MATERIAL

Minimal gas vitrectomy and as-needed positioning duration for idiopathic macular holes

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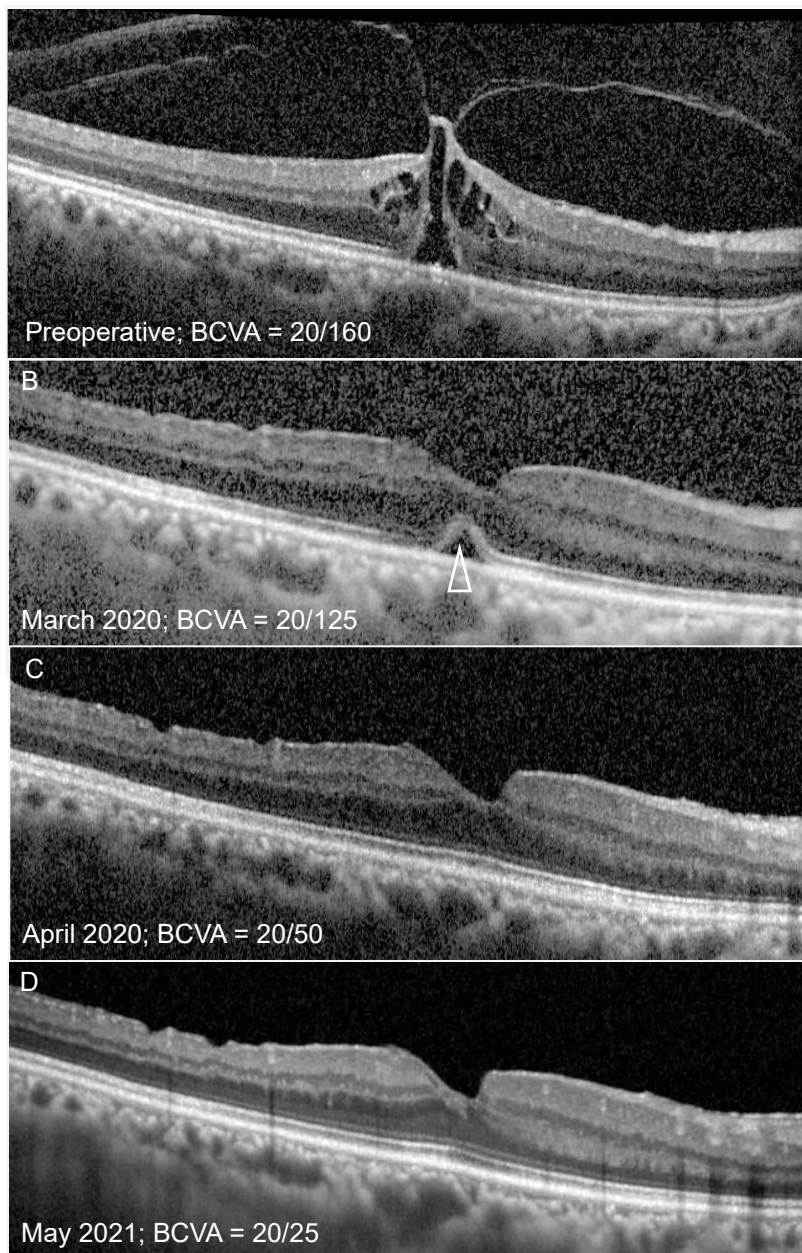
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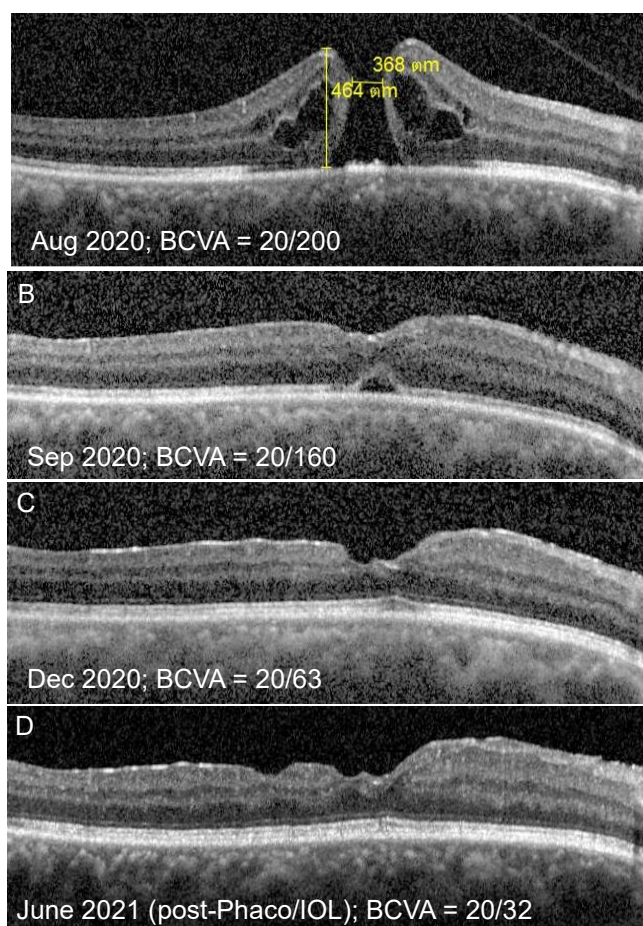
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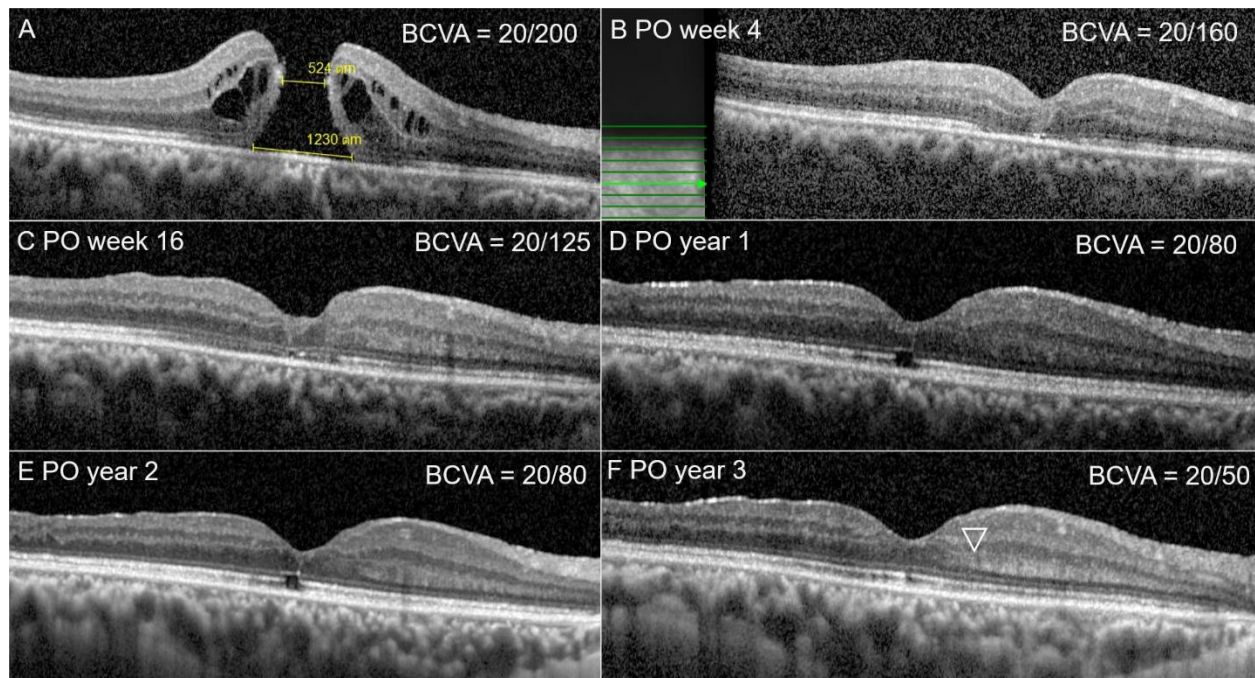
SUPPLEMENTARY FIGURE 1: A 54-year-old man underwent vitrectomy and foveal-sparing internal limiting membrane peeling without gas tamponade for vitreomacular traction (**A**). The subfoveal fluid pocket was detected during the early postoperative period (arrowhead, **B**) and subsequently replaced by the outer retinal layers in a gradual manner (**C**). Fourteen months postoperatively, his vision markedly improved to 20/25 with a continuous restoration of ellipsoidal zone (**D**).

BCVA Best-corrected visual acuity, PO postoperative



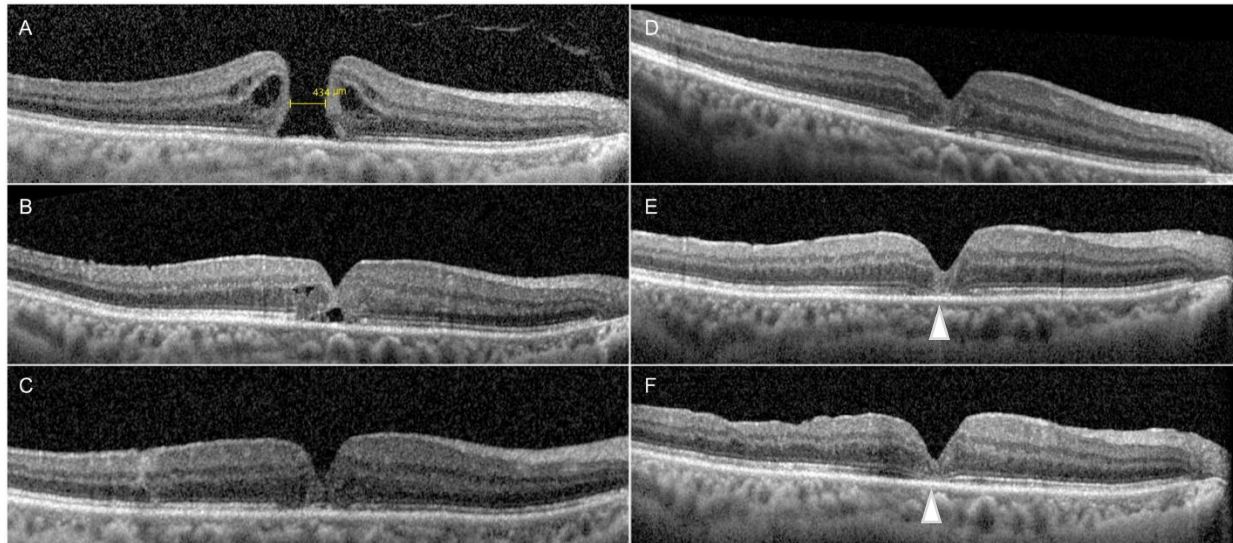
SUPPLEMENTARY FIGURE 2. A 62-year-old man underwent vitrectomy, internal limiting membrane peeling, and fluid-gas exchange with 20% sulfur hexafluoride for an idiopathic macular hole (**A**). Intraoperatively, a gas regulator leaked, causing the tamponade agent to resolve by the 3rd day postoperatively, leading to hole closure coinciding with a residual subfoveal fluid pocket (**B**). The fluid pocket resolved four months postoperatively and was replaced by the outer retinal layers (**C**). Ten months postoperatively, his vision improved to 20/32 with a slight attenuation of the ellipsoidal layers (**D**). This case (**Figure S2B**) illustrates the advantages of minimal gas vitrectomy (MGV) regarding the convenience of imaging that could be performed through fluid as early as day one post-surgery. Similarly, the patient could begin to see from the first postoperative day. In the presence of intraocular gas, we observed that the bottom edge of the gas bubble remained above the foveal level, even with the injection of 1.0 mL of pure sulfur hexafluoride in the MGV-treated eyes (**Figure S4B**).

BCVA Best-corrected visual acuity, *PO* postoperative



SUPPLEMENTARY FIGURE 3. A clinical progression of a 57-year-old woman who underwent vitrectomy combined with fovea-sparing internal limiting membrane peeling and standard fluid-gas exchange using 10% perfluoropropane for an idiopathic, medium-sized macular hole (minimal hole diameter of 524 μm) (**A**). During a gas resolution, she achieved hole closure, which was accompanied by a noticeable disruption of the outer foveal layers four weeks post-surgery (**B**). By the third year postoperatively, there was progressive regeneration of the photoreceptor layers, leading to a visual acuity of 20/50 and a slightly attenuated inner segment/outer segment line (**C-F**). Persistent hyperreflectivity in the Henle fiber layer or an angular sign of its incomplete recovery was noted (arrow) (**F**).

BCVA Best-corrected visual acuity, *PO* postoperative



SUPPLEMENTARY FIGURE 4: A 58-year-old woman who experienced delayed recovery of ellipsoidal layers after undergoing minimal gas vitrectomy for a moderate-sized macular hole (**A**). An initial hole apposition was observed on postoperative Day 1 (**B**). Despite being instructed to switch to an upright position, the patient continued to strictly maintain a prone position for one week. As a result, a fluid pocket collapsed three days after the surgery (**C**). Her vision and outer retinal layers showed delayed recovery although the macular hole remained closed throughout the 12-month follow-up (**D-F**). The study's analysis did not include this particular patient.