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学位論文の題名	Visual prognosis of submacular hemorrhage secondary to age-related macular degeneration: A retrospective multicenter survey (加齢黄斑変性に伴う黄斑下出血の視力予後：後ろ向き多施設共同研究) PLoS ONE, 17(7): e0271447, 2022
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Purpose: To investigate the clinical features, treatment options, and visual outcomes of submacular hemorrhage (SMH) secondary to neovascular age-related macular degeneration (nAMD).

Methods: A retrospective, multicenter, observational case series. One hundred twenty-seven eyes of 127 consecutive patients (88 men, 39 women; (mean age, 74.2 years)) diagnosed with AMD-associated SMHs exceeding 2 disc diameters involving the fovea were included. The AMD types, previous treatments, treatment options, anatomic findings, and best-corrected visual acuity (BCVA) were assessed.

Results: Thirty-two eyes had typical AMD, 94 eyes polypoidal choroidal vasculopathy (PCV), and one eye retinal angiomatous proliferation. Eighty-five eyes were treatment-naïve; 42 eyes were treated previously: anti-vascular endothelial growth factor (VEGF) therapy (n=26), photodynamic therapy (n=3), and combined therapy (n=13). Treatment of SMHs included vitrectomy (36 eyes), pneumatic displacement (49 eyes), and anti-VEGF monotherapy (42 eyes). The final BCVA improved significantly in treatment-naïve cases from 0.86 to 0.62 logarithm of the minimal angle of resolution (logMAR) unit and from 0.80 to 0.56 in PCV cases. Meanwhile, the BCVA logMAR values improved from 1.15 to 0.75 and from 0.87 to 0.63 in eyes that underwent vitrectomy or pneumatic displacement, respectively. In eyes with BCVAs between 20/133 to 20/40 at SMH onset, the final VA in the pneumatic displacement group was better than in the anti-VEGF monotherapy group. One eye had a retinal detachment and 1 eye had a macular hole in the vitrectomy group, and 5 eyes had a vitreous hemorrhage in the pneumatic displacement group.

Conclusions: The recommended treatment for SMHs secondary to nAMD exceeding 2 disc area and with BCVA below 20/40 is vitrectomy or pneumatic displacement for visual improvement.