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TOO BIG TO FAIL? PROBABILITY OF SUCCESSFUL MACULAR HOLE CLOSURE BY SUBRETINAL HYDRODISSECTION

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A variety of novel surgical techniques have been described to close persisting macular holes (MH). Subretinal hydrodissection has gained increasing interest to close large and persisting macular holes. The goal of this study was to evaluate the success rate and upper limit to close large macular holes.

In a retrospective interventional case series, we applied this grading system to 152 persisting MH, who have been treated by 44 international surgeons with macular hydrodissection and a minimum follow-up of 9 months. We identified 119 primary MH and 33 secondary MH. We compared the closure rates according to the CLOSE study group introduced in 2023 a novel grading system: small MH <250 µm, medium MH 251-400 µm, Large MH 401-550 µm, XLarge MH 551-800 µm, XXL large MH 801-1000 µm and giant MH >1000 µm.

The closure rate for all eyes (n=152) was 83.3% separated in 89.9% in primary MH (n=119) and 60% in secondary MH (n=33). To identify the “best gainers” of this technique, we divided the 119 primary MH according to the CLOSE study and calculated the following closure rate: Small MH (n=13) 13 closed / 0 open = 100%, medium MH (n=15) 14/1 93%, Large MH (n=24) 20/4 83.3%, XLarge MH (n=46) 44/2 95.6%, XX large MH (n=16) 15/1 93.7% and giant MH (n=5) 1/4 20%. Successful anatomical closure correlated with a good final visual acuity on logMAR: small MH 0.6 (SD 0.12), medium MH 0.65 (SD 0.25), large MH 0.64 (SD 0.32), XLarge MH 0.57 (SD 0.37), XXL large MH 0.65 (SD 0.32). Primary MH above 1000 µm presented low anatomical closure rate (20%) and poor functional outcome 1.0 (SD 0.25).

For macular hydrodissection, there seems to be an upper limit to release enough retinal tissue to cover the entire MH. This fact may become important in larger MHs, as its area size increases exponentially with the corresponding radius e.g.: While a XXL large MH with 800 µm diameter covers an area of 0.5 mm², it doubles in a 1200 µm giant MH to 1.1 mm². Our global perspective showed comparable functional and anatomical results for small, medium and all large persisting MH up to 1000 µm diameter with a high anatomical closure rate of 93% and good final visual acuity. While giant MH with >1000 µm diameter correspond to a critical size of >0.78 mm², this may be too large to achieve a reliable closure in persisting MH. Most vitreoretinal surgeons are familiar with subretinal fluid application. Macular hydrodissection is therefore a promising tool as a rescue technique when, after previous unsuccessful attempts, there is no ILM left for an ILM patching approach.

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