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Surgical Treatment of Glaucoma – Literature and Video Review of Blebs, Tubes, and Micro-Invasive Glaucoma Surgeries (MIGS)

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Abstract : Purpose: Glaucoma is the second cause of worldwide blindness and the first cause of irreversible blindness. Trabeculectomy, the standard glaucoma surgery, has a success rate between 36.0% and 98.0% at three years and a high complication rate, leading to the development of different surgeries, micro-invasive glaucoma surgeries (MIGS). MIGS devices are diverse and have various indications, risks, and effectiveness. We intended to review MIGS' surgical techniques, indications, contra-indications, and IOP effect. Methods: We performed a literature review of MIGS to differentiate the devices and their reported effectiveness compared to traditional surgery (tubes and blebs). We also conducted a video review of the last 1000 glaucoma surgeries of the author (including MIGS, but also trabeculectomy, deep sclerectomy, and tubes of Ahmed and Baerveldt) performed at glaucoma and advanced anterior segment fellowship in Canada and France, to describe preferred surgical techniques for each. Results: We present the videos with surgical techniques and pearls for each surgery. Glaucoma surgeries included: 1- bleb surgery (namely trabeculectomy, with releasable sutures or with slip knots, deep sclerectomy, Ahmed valve, Baerveldt tube), 2- MIGS with bleb, also known as MIBS (including XEN 45, XEN 63, and Preserflo), 3- MIGS increasing supra-choroidal flow (iStar), 4-MIGS increasing trabecular flow (iStent, gonioscopy-assisted transluminal trabeculotomy - GATT, goniotomy, excimer laser trabeculostomy -ELT), and 5-MIGS decreasing aqueous humor production (endocyclophotocoagulation, ECP). There was also needling (ab interno and ab externo) performed at the operating room and irido-zonulo-hyaloïdectomy (IZHV). Each technique had different indications and contra-indications. Conclusion: MIGS are valuable in glaucoma surgery, such as traditional surgery with trabeculectomy and tubes. All glaucoma surgery can be combined with phacoemulsification (there may be a synergistic effect on MIGS + cataract surgery). In addition, some MIGS may be combined for further intraocular pressure lowering effect (for example, iStents with goniotomy and ECP). A good surgical technique and postoperative management are fundamental to increasing success and good practice in all glaucoma surgery.

Keywords : glaucoma, migs, surgery, video, review
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