Early studies suggest that increasing choroidal aqueous flow could enhance the success rate of glaucoma filtering surgeries, such as deep sclerectomy, Andre Mermoud MD, Lausanne, Switzerland, told the XXX Congress of the ESCRS. New implants that promote suprachoroidal outflow, including collagen and injectable viscoelastic devices, show promise and may soon be available, Dr Mermoud noted. However, these devices have not been followed long, and large, long-term studies are needed to determine their safety and efficacy, he said.

Studies show that 45 per cent to 70 per cent of patients who have had non-penetrating filtration surgery have suprachoroidal aqueous flow, Dr Mermoud said. This is the result of communication between intrascleral and suprachoroidal space through the thin layer of sclera left at the bottom of the dissection in deep sclerectomy.

Dr Mermoud noted several possible benefits from increasing suprachoroidal outflow. One is long-term reduction of intraocular pressure (IOP). Unlike trabeculectomy or tube-shunt patients, IOP trends downward in deep sclerectomy patients for 12 years or more, generally staying in the 10 to 15 mmHg range. “We think this may be due to subchoroidal flow, but we really don’t know.”

Another possible benefit is reduced risk of bleb complications. Dr Mermoud observed that deep sclerectomy patients with subchoroidal spaces and outflow visible on ultrasound (UBM) also have smaller subconjunctival blebs than those with no evidence of choroidal outflow.

Dr Mermoud’s efforts to surgically enhance suprachoroidal flow include a 2005-2006 study in which he compared 25 deep sclerectomy patients with 25 patients receiving very deep sclerectomy, in which small sections of deep sclera are removed at the posterior of the incision. At eight months, there was no statistically significant difference in IOP between the two groups. However, the very deep sclerectomy patients had smaller subconjunctival blebs and more suprachoroidal flow, as well as subchoroidal hyperechoic spaces that could indicate the formation of new uveal outflow pathways.

More recently, Dr Mermoud has attempted to promote aqueous flow in the suprachoroidal space using devices in the intrascleral and suprachoroidal spaces. He inserted the collagen Aqualflow implant in a sub-scleral pocket, but had better results with a “belt” technique, in which the implant is inserted in two holes in the deep sclera, which creates intrascleral-subchoroidal flow.

The viscoelastic Healaflow was injected into the suprachoroidal space through a hole in the deep sclera, Dr Mermoud said. The scleral flap was sutured over it and additional Healaflow injected and forced into the newly created space. The viscoelastic keeps the passages open after surgery, and may prevent excessive outflow leading to hypotony. Ultrasound confirmed intrascleral and suprachoroidal flow with little or no subconjunctival bleb in patients with deep sclerectomy and Healaflow.

In a study comparing 25 Healaflow patients with 40 sub-scleral pocket and 39 belt (collagen implant) patients, all combined with deep sclerectomy, belt patients saw a greater initial IOP drop, but the numbers were similar at one month, with all three groups showing IOP reduction between 10 and 11.9 mmHg, Dr Mermoud reported.

Complications were also low in all groups, Dr Mermoud said. Hypotony was observed in one sub-scleral and three “belt” patients, of which two occurred after needling. Hyphaema occurred in one sub-scleral, two “belt” and one Healaflow patient, while two suture complications were observed in belt patients and one in Healaflow.

These results are promising, but questions remain, Dr Mermoud said. “How long will it function? That is a big question mark.”

Andre Mermoud MD