Fugo Blade effective tool for multiple surgical applications

Daljit Singh

The Fugo Blade (MediSURG Research & Management Corporation) is a versatile and effective tool that can be used in a wide range of surgical applications from the surface of the eyeball to the retina, according to Daljit Singh MD.

“This really is a remarkable piece of equipment. The unit ablates tissue using plasma energy in a manner similar to the excimer laser, and is approved for intraocular use by the Food and Drug Administration (FDA) in the US,” he said.

Addressing delegates attending the 66th annual conference of the All India Ophthalmological Society (AIOS), Dr Singh said that in the nine years that he has been using the Fugo Blade it has become an invaluable part of his surgical toolkit.

The instrument, invented by US ophthalmic surgeon Dr Richard Fugo, consists of a console and a hand-piece with a disposable tip. Three rechargeable battery cells provide the energy. The power generated is about one watt and little energy is needed to energise the cutting tip. One charge lasts for about an hour of cutting time, said Dr Singh.

He noted that the plasma that is generated on the 100-micron filament of the disposable tip is visible under high magnification, and ablates in such a way that it creates a smooth wall along the ablation/incision path.

Although the plasma energy at the tip reaches high temperatures, the heated field does not extend beyond 25 microns of the plasma and therefore does not burn or cauterise tissue, said Dr Singh. He explained that the Blade generates incision walls that hemostase without charring or burning yet still provide resistance-free cutting.

Resistance-free cutting

Dr Singh said that one of the advantages of the Fugo Blade is that it “cuts” resistance-free and sharper than any instrument on the surgeon’s tray using minimal power, causing no bleeding or collateral tissue damage, and offering the operator unsurpassed control. He advised that the Fugo Blade should only be used in the presence of a well-formed anterior chamber.

“An empty anterior chamber invites injury to the tissues, especially the corneal endothelium. The chamber should be filled completely before the Fugo Blade is used. The moment the anterior chamber appears to shallow, the tip is withdrawn and the chamber refilled. I prefer to have an assistant push the viscoelastic from the side port and complete the procedure at a controlled and measured pace. This not only keeps the chamber maintained but also helps to clear any cavitation bubbles that may form, hence maintaining a clear view of the capsulotomy,” he said. Dr Singh said that the Fugo Blade is extremely useful in rapidly ablating paediatric cataracts, which can then simply be washed out.

Among other applications, Dr Singh said that the Fugo Blade could be used for anterior capsulotomy in every kind of cataract without the need for trypan blue, cutting fibrovascular membranes and doing pupilloplasty without traction or bleeding, iridotomy, a small anterior vitrectomy, glaucoma and filtration surgery, bloodless clean and efficient strabismus surgery, conjunctival route levator muscle application through three buttonhole incisions for ptosis correction, triaschisis surgery. Fugo Blade-made corneal tracks to manage oedema and bullous keratopathy. Making a punctum or clearing the surface of the eyeball to the retina, and even ablates targeted tortuous blood vessels.

“It has great utility in paediatric as well as adult capsulotomy especially if the capsule is stretched by intumescent cataract, or the capsule is thickened or scarred for any reason. A capsular rent extending towards the equator is a perfect recipe for an impending vitreous problem. However, a Fugo Blade incision ahead of the rent stops its further progress. In short, if a surgeon has a Fugo Blade, he will never do a capsulotomy without it. It is so easy and so sure,” he said.

“In paediatric cataract it allows perfect control over the capsulotomy and takes the variability out of the surgery. This translates into shorter surgical time, which is of paramount importance for the busy cataract surgeon and also exposes the patient to lower doses of anesthetic gases. The capsulotomy may be made in one attempt or in many attempts, the result being the same – a desirable strong capsular rim size of the surgeon’s choice,” Dr Singh said.

Another benefit of the blade is apparent in managing posterior capsule problems, said Dr Singh. Firstly, an incision with the blade around any tear in the posterior capsule can help to prevent the tear extending further. Furthermore, a deliberate round posterior capsulotomy can be fashioned for optic capture of the implanted posterior chamber lens. Posterior capsular plaque can also be removed either by performing posterior capsulotomy around the plaque or by using the Fugo Blade like an “eraser.” To achieve the latter, the last 0.7mm of the under-surface of the Fugo Blade tip is denuded of its Teflon cover, allowing the plaque to be erased without damaging the vitreous face.

The Fugo Blade also makes life easier in tackling thick fibrous or fibrovascular membranes that are frequently encountered as a congenital or acquired condition. The blade tip can be wriggled under the optic of any design of intraocular lens to perform membranectomy.

“Any thick membrane under the optic is cut with the greatest ease with the plasma of the Fugo Blade. Even though the tip touches the optic, the optic is not harmed,” said Dr Singh.

The Fugo Blade can also be successfully employed to perform iridotomy, especially in cases where bleeding from the iris may occur if a manual iridectomy is done.

“In pars plana vitrectomised cases, the blood may start trickling into the vitreous and cause immense problems in recovery. In such cases, bloodless iridotomy can be performed by simply rubbing the tip of the Fugo Blade across the iris or moving the tip in a circular fashion, to obtain a round hole of a desirable size,” he said.

Another application of the blade is pupilloplasty, said Dr Singh, which may be needed in many cases undergoing surgery for traumatic cataract or a secondary implant.

“It may be performed before lens implantation or after the lens has been implanted. With the Fugo Blade, the procedure is easy, bloodless and lacks postoperative reaction as a result of plasma blade surgery,” he said.

Numerous glaucoma applications

One of the most exciting applications of the Fugo plasma technology is in glaucoma surgery, added Dr Singh. Its ablative power is capable of making filtration tracks in a wide variety of ways to suit the needs of the individual surgeons and the specific conditions of the patients.

It can stop bleeding on the surface of the eyeball, can create a scleral flap and can also create a lake under the flap. It can make short or long gutters on the sclera to drain fluid away from the surgical area and can assist in performing standard trabeculectomy procedures. It can also be used for transcleral filtration, transconjunctival transcleral filtration, non-perforating filtration surgery, microtrack filtration and cyclodalysis.

Given its wide-ranging utility, Dr Singh told EuroTimes that he was disappointed but not overly surprised that the Fugo Blade has not become a ubiquitous part of every ophthalmic surgeon’s equipment.