

# Indovations in vitreo-retinal surgery

Ajay I Dudani<sup>1</sup>, Mridhula Sekar<sup>2\*</sup>

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## DESCRIPTION

Oxford dictionary recently accepted the word “Jugaad” into their latest update and is defined as flexible approach to solve a problem that uses limited resources in an innovative way [1]. Being very instrument intensive, practicing surgical vitreo-retina has its own limitations. Necessity is the mother of all inventions, gave rise to the concept of self-designed, low cost instruments that can easily be fashioned in the operation theatre by the surgeon himself [2].

23 G Snip and suture method where 23 G biplanar sclerotomies are made with Micro Vitreo Retinal (MVR) blades oriented perpendicular to the limbus with a snip on the overlying conjunctiva. The anatomy of the wound is such that it approximates antero-posteriorly and helps in complete leak proof closure, owing to the anatomy of the scleral fibres. Instruments can be introduced through these sclerotomies easily and avoids the use of trocar cannula which need sterilization after every case and also cannot be reused multiple times.

A 4.5 mm flanged self-retaining infusion cannula can be connected to the main fluid line. Phacoemulsification machine in the anterior vitrectomy mode for the Pars Plana Vitrectomy (PPV) with a cut rate of 500-700 cuts/min has proven to be remarkably effective and can be readily used to start posterior segment surgeries in an anterior segment surgery set up. Machemer hand-held, self-irrigating lenses (45 and -90) held in place with simple viscoelastic on the cornea provides a clear view for core vitrectomy. With minimal indentation by the assistant, view wide enough for vitreous base excision is achieved.

Self-styled micro hooked 23 G needle made by scraping the 23 G needle on the serrated handgrip of a forceps can be used to initiate Internal Limiting Membrane (ILM) peeling or raise a flap to pick an Epi Retinal Membrane (ERM) off the surface of the retina. This, almost no cost device along with Internal Limiting Membrane (ILM) forceps can be used to handle complex membranes in a diabetic eye or Proliferative Vitreo Retinopathy (PVR) in cases of retinal detachments. Initiation of membrane dissection with this needle from over the disc (Disc onward dissection) is a reproducible, reliable method when vitreoschisis and improper plane of dissection is a problem in diabetic membranes.

Similarly for fluid air exchange and endo drainage, a self-styled flute needle made with a 5 cc or 10 cc syringe with a hole bored into its shaft for finger control of fluid can replace the need for machine and foot pedal controlled fluid aspiration. Simple fish tank air pump with a micro pore filter and IV set tubing's to control the air infusion; can be used for fluid air exchange. A water bath in a glass bottle provides hydrated air to prevent drying of the posterior surface of the Intra Ocular Lens (IOL) or the crystalline lens capsule during fluid air exchange. Silicone oil injection using a 2 cc Leuer lock syringe with a 2 cm long shaft made from a 20 G needle can be used

as replacement for an automated silicone oil injector. The requisite high infusion pressure with a short infusion line, which is necessary to reduce the resistance while injecting silicone oil is provided by this indovation in compliance with Poiseuille's law.

Sleeveless phaco probe can be used for phaco-fragmentation in cases of dropped nucleus. One sclerotomy must be enlarged to allow entry of the 18 G phaco probe. Hard brown cataracts can be impaled up with a 20 G needle and delivered out through the corneo scleral tunnel [3]. This has proven to be maximally atraumatic and allows no risk of damage to retina due to excessive phaco power. Alternatively, the hard dropped nucleus can also be floated up with PFCL after complete vitrectomy and delivered out en-mass through a corneo scleral tunnel. Dropped IOL, once all the vitreous adhesions are relieved, can be hooked up with cutter aspiration and brought up to the anterior chamber and repositioned or explanted as per other factors. The chance of retinal touch or pinch due to picking up of dropped IOL using ILM forceps is completely done away with. IOL in the mid vitreous cavity can be delivered out in the most atraumatic way using to the ‘induced-levitation’ concept [4]. Opening a pre-existing corneo scleral tunnel or fashioning a tunnel while keeping an eye of the dislocated IOL will cause the IOL to levitate into the pupillary axis and sometimes even to the iris plane due to change in the fluidics of the closed chamber. Gushing out of aqueous through the open tunnel will cause the liquefied vitreous to take its place, the anterior hyaloid migrates forward, therefore bringing the IOL to our grasp. This technique has been successful every time. After this one can get away with just a core vitrectomy if needed. Same technique can be replicated for dropped nucleus fragments and also for dropped nucleus lying in the mid vitreous cavity.

These innovations are applicable in any hospital even with only a cataract set up. These are inexpensive, reliable, reproducible methods that can give good surgical outcomes. Frugality without the loss of functionality is the birth of science and innovation [5].

## REFERENCES

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<sup>1</sup>Mumbai Retina Centre, Mumbai, India; <sup>2</sup>KJ Somaiya Medical College, Maharashtra University of Health Sciences, Mumbai, India

**Correspondence:** Mridhula Sekar, KJ Somaiya Medical College, Maharashtra University of Health Sciences, Mumbai, India, Email: mridhula.sekar@gmail.com

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