

New Device: PC Maintainer

Clinical Scenario #1

- A patient returns to the OR for Vitrectomy #3 on the same eye.
 - He underwent PPV for RD complicated by PVR and thus needed silicone oil tamponade.
 - Re-growth of PVR resulted in second operation.
 - Thankfully, retina is now flat and ready for PPV with silicone oil removal, his third and hopefully final surgery
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Clinical Scenario #1

- At the conclusion of the vitrectomy, when it is time to remove the ports, it is noted that the sclerotomies for the instrument and light pipe ports both leak and require suturing with 7-0 vycril.
 - Anticipating that the infusion cannula too will leak, as the surgeon you prepare the vycril suture and place it simultaneously as the trocar is removed.
 - Despite that well executed maneuver, the eye becomes hypotonous during the short time of suture tying
 - A 30 gauge needle with sterile air is used to perform an injection into the vitreous chamber, and the IOP is restored to normal and the case is concluded.
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Discussion of problem to Overcome

- The described scenario is not uncommon for me. Despite what Steve Charles has said at many lectures, that he “has not needed to suture a wound since the introduction of small gauge vitrectomy”, I find that in re-operations it is often required.
 - I do not consider the closure of sclerotomy wounds to be a difficult maneuver. However, in comparison to every other part of modern day vitrectomy, it is the least elegant and the least controlled.
 - Placement of a suture while simultaneously pulling the trocar is considered by some to be challenging, awkward, and at times dangerous.
 - If the suture is not passed precisely, conj/scleral laceration can occur. If the suture is not placed perfectly and tied quickly, a prolonged period of hypotony may result.
 - Additionally, if IOP is lost completely, suturing on a soft globe is that much more challenging and potentially dangerous.
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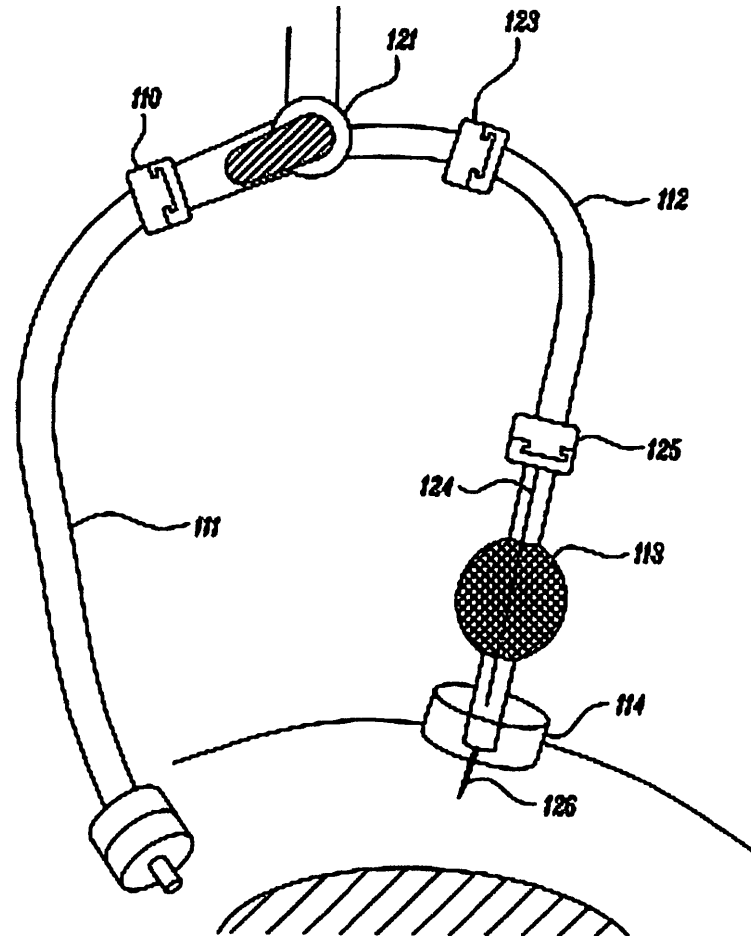
Discussion of problem to Overcome

- Imagine that same described scenario, but now include that during the case, a retinectomy was performed. Although hemostasis was achieved during the case, a severe loss of IOP, even if transient, may result in post-op hemorrhage found on day 1
 - Most importantly, imagine you are the attending surgeon on the case, and a 1st or 2nd year fellow is primary surgeon. The maneuver to cleanly place that final suture may not be smooth and risks are thus increased.
 - My former mentor from training describes this moment of the case as one of his most anxiety provoking
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A new device to solve the problem.

- I propose a hands free infusion line that terminates on a short 30 or 32 gauge needle, placed in the infero-nasal quadrant of the sclera as a solution.
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PC (Posterior Chamber) Maintainer



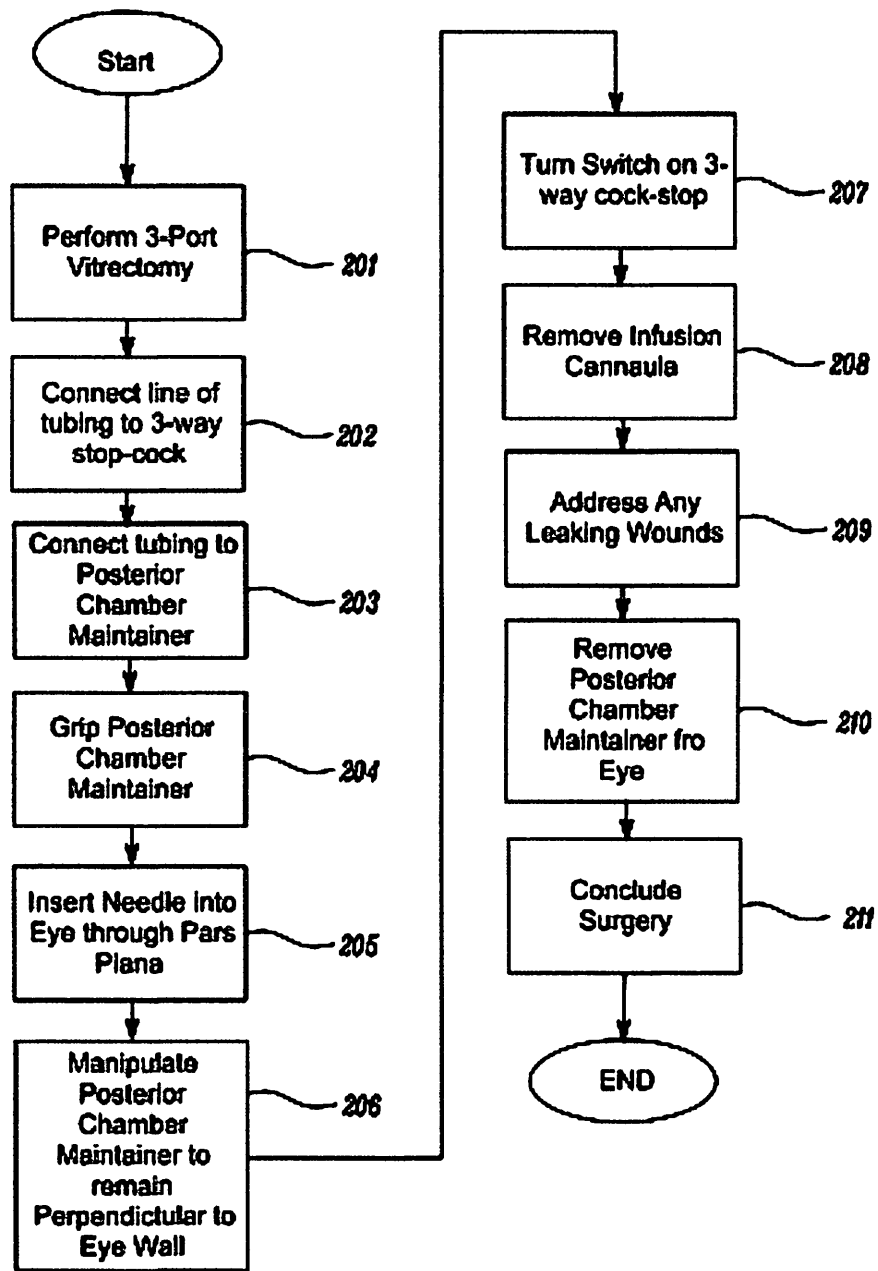


FIG. 2

The PC maintainer must be safe, effective, and hands free

- It must safely sit perpendicular to the eye wall, or in whatever position the surgeon wishes, so that it does not travel into the suprachoroidal space, and does not threaten the phakic lens or retina.
 - It must provide enough infusion flow into the eye to keep the eye formed despite a leaking sclerotomy wound
 - It must be secured into place, allowing both hands of the surgeon to focus on closure of the sclerotomy
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Design features that make it hands free

- The PC Maintainer has two key elements to make it hands free
 - The tubing will be able to be shaped. Much like the chandelier light, that has a malleable annealed steel wire afixed to the outside of the tubing so that it can be bent into shape, so too will this device
 - At the terminal end of the device, at the junction where the tubing meets the needle, there will be a “stablilizing disc”. This rigid disc will be approximately 4-7mm in diameter and will prevent against torquing of the needle in the intravitreal space as it sits flush to the eye wall.
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Ease of use

- When the surgeon recognizes that there will likely be a need for suturing of his infusion sclerotomy, he can then ask for the nurse to introduce the PC Maintainer onto the surgical field.
 - It will hook up to the 3 way stop-cock.
 - The surgeon grasps the device on its ergonomic grip, and chooses his location to introduce it into the eye through the pars plana
 - The device will be pushed flush into the eye until it hits a hard stop at the stabilizing disc.
 - The tubing is shaped in such a way to encourage the perpendicular orientation to the eye wall.
 - The tubing is taped to the patient's nose.
 - When the surgeon is ready, the 3-way stopcock is turned to divert flow through the device
 - The infusion cannula is then removed and sutured and the IOP is maintained, making this safe and easy.
 - Once the surgeon is confident all wounds have been addressed, the device is pulled and the 30 gauge puncture is self sealing.
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Early Adapters

- This device, I believe, will be appreciated by all those who train fellows.
 - Every teaching institution should be targeted and introduced to this product. It was invented with trainees in mind.
 - This device will hopefully make surgery safer, and make surgeons more confident during that final moment as the last wound is addressed.
 - Those in practice may not use this right away, but those who graduate through training will likely continue to ask for it when the situation arises.
 - Seasoned surgeons eventually will also recognize its utility. Any re-operation, vitrectomies on high myopes, etc when wound leaks are common will benefit from having this device
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