

The need for all cataract surgeons to run a regular vitreous loss fire drill

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Calling all cataract surgeons! Is your low vitreous loss rate storing up future problems for your staff or trainees? Vitreous loss is a rare but inevitable complication of cataract surgery, occurring in ~2% of phacoemulsification surgeries, yet the predicted probability for this complication can range from <0.75 to >75%, depending on the patient's risk profile.¹ Despite risk stratification, these numbers can be unduly influenced and confounded in a training university hospital environment by the experience level of the surgeon and the degree of supervision provided.

As capsule rupture and vitreous loss can be a stressful situation, it follows then that a robust plan is required to ensure proper management, particularly when it is a relatively rare occurrence. Proper management requires that the necessary equipment be readily available and that both the surgeon and theatre staff be familiar with its setup and use. The proper and timely management of vitreous loss can have a significant impact on patient outcomes, principally retinal detachment and cystoid macular oedema.^{1,2} A recent publication from the UK National Ophthalmology Database Study of Cataract Surgery suggested that a surgeon's level of experience was a risk factor in pseudophakic retinal detachment, which they extrapolated to be related to the quality of the management of vitreous loss.²

A trainee ophthalmologist may only see vitreous loss on two occasions every 100 cataract surgeries. The actual rate may be much lower if the senior surgeon operates on the complex cases. A recent publication demonstrated that opportunities to manage such surgical complications as a trainee are scarce.³ In the private practice setting, the cataract surgeon's low complication rate can result in a lack of familiarity for the theatre staff to the practical measures required to address vitreous loss. This

lack of familiarity can be magnified with new trainees, a rapid turnover of theatre staff, or a new theatre environment.

The best way to address this situation is to regularly run a 'vitreous loss practice drill'; to educate and evaluate the surgical team's ability to anticipate and deal with this event.

To test this theory, ophthalmologists attending a recent West of Scotland postgraduate teaching session were surveyed regarding their level of experience of cataract surgery. Subsequently, they were asked to identify any additional items required to perform an anterior vitrectomy and specify their location in the theatre suite. There were 22 responses in total, comprising 13 consultants and 9 trainees from a range of hospitals. No respondent had ever previously participated in a 'practice drill'. Additional items requested included: anterior vitrector (91%), triamcinolone (73%), miochol (59%), suture (41%), and a three-piece IOL (36%), and 23% requested an experienced theatre nurse! Only 13% of surgeons could identify exactly where to find the required equipment. Indeed, 13% stated they were in a (non-specific) cupboard, 23% would ask the theatre nurse, and 50% stated that they did not know the precise location. Following this exercise, an educational session was delivered to all attendees and theatre staff to improve knowledge and orientate them to the theatre environment. This 'vitreous loss fire drill' has since been repeated at 6 monthly intervals to maintain awareness and optimize training exposure.

The purpose of a 'fire drill' is to familiarize the participants with an uncommon emergency procedure (safe evacuation) during a stressful situation (eg, a fire) that requires effective action for an optimum outcome. A similar exercise has been performed for intravitreal antibiotics in the emergency setting.⁴ We recommend that similar practice runs should be conducted with all new trainees, surgeons, and staff for the safe and effective management of vitreous loss. A simple survey can be a cost-effective teaching tool and



Figure 1 Photograph illustrating the contents of a typical emergency anterior vitrectomy kit (AntVitKit) for cataract surgery, containing an anterior vitrector, triamcinolone, miochol, and a 10–0 nylon suture.

reveal where further education and practice are required, and this can supplement the drive towards modern surgical simulation.^{3–6}

The issues raised here have resulted in the creation of an anterior vitrectomy kit (AntVitKit), where these four necessary surgical adjuncts are kept together in a single bag in the drawer of the phacoemulsification machine (Figure 1). This AntVitKit contains the anterior vitrector, triamcinolone, miochol, and a 10–0 nylon suture. When vitreous loss occurs, the surgeon can simply ask for the AntVitKit, and all contents are immediately available within seconds. Once used, this AntVitKit should be restocked at the end of the case, so there is a new supply of the four surgical adjuncts when next required.

To conclude, we have identified the need to run a regular vitreous loss fire drill to ensure that all surgical team members are familiar with all necessary adjuncts to deal with vitreous loss. This is a simple and effective teaching tool to walk-through procedures prior to the actual clinical event. It is useful in the training university hospital environment, but equally it is relevant in situations with low rates of vitreous loss, including private practice settings. Adopting this vitreous loss fire drill will ensure practices are safely rehearsed before this rare but predictable event, and creating an ‘AntVitKit pack’ should reduce stress and optimize the experience for both the patient and surgeon.

Conflict of interest

The authors declare no conflict of interest.

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