Lid Speculum With a Drape

A disposable, cost-effective device for pre- and intraoperative infection control.

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Postoperative endophthalmitis can severely damage ocular tissues. The most common infecting agents are *Staphylococcus aureus*, from the bacterial flora of the eyelid, and *Propionibacterium acnes*, present on the meibomian and sebaceous glands. It has been reported that endophthalmitis occurs when these agents gain entry into the eye through a contaminated surgical field. Therefore, pre- and intraoperative infection control is crucial to prevent endophthalmitis.

Preoperative prophylaxis to minimize contamination of the surgical field includes topical antibiotics, thorough disinfection, and appropriate draping. Among these measures, appropriate draping prevents exposure of the eyelashes and eyelids to the surgical field and thus reduces bacterial contamination. Conventional draping includes using an adhesive drape to cover the eyelashes and eyelids and a metallic lid speculum to hold the eyelids open. However, conventional draping does not completely cover the eyelashes and eyelids at the medial and lateral angles of the eye, and meibomian secretions can enter the surgical field from gaps between the adhesive drape and eyelids. We recently designed a simple and reliable draping system using a new lid speculum, which is described below. A video highlighting use of this device can be viewed at http://eyetube.net/?v=pomep.

**LID SPECULUM WITH A DRAPE**

**Description.** The lid speculum with a drape is a cylindrical device consisting of two rings, an upper (58 mm) and a lower (five sizes: 25, 26, 27, 28, and 29 mm), each made of thermoplastic resin, and a transparent elastic silicone membrane that attaches to the rings (Figure 1). The eyelids are sandwiched between the upper and lower rings, and the opening of the rings is the surgical field. The eyelids are kept open by the tension of the thermoplastic resin. Eyelashes, eyelids, and the meibomian glands are physically blocked by the transparent elastic silicone membrane, preventing contact with surgical instruments and with the surgical field. Tension is also applied to the entire eyelid, preventing damage that can sometimes occur with a conventional metallic lid speculum. Our lid speculum is disposable.

**Installation and removal.** To select the appropriately sized lower ring, measure the width of the patient’s palpebral fissure and select a ring of the same size or one size smaller. Installation of the lid speculum with drape is simple: Fold the upper ring, pull the upper eyelid up, and insert the lower ring first into the conjunctival sac of the upper eyelid and then into the lower eyelid in a similar manner. Removal is also easily achieved by reversing the procedure.

**CLINICAL APPLICATIONS**

We have used our novel lid speculum with drape for several clinical applications, including cataract surgery, intravitreal injection, vitreous surgery, and glaucoma surgery.

**Cataract surgery.** We typically perform cataract surgery with a superior corneoscleral incision, and this lid speculum provides an adequate surgical field intraoperatively.

![Figure 1. Lid speculum with a drape. (1) Upper ring: 58 mm, thermoplastic resin; (2) bottom ring: 25 to 29 mm, thermoplastic resin; (3) translucent elastic membrane: silicone.](http://eyetube.net/?v=pomep)
Additionally, insertion of surgical instruments is not impeded, and the speculum does not come loose due to blinking during surgery. In summary, this device fulfills its original function as a speculum. Draping is perfect, eyelashes are kept out of the surgical field, and no meibomian secretions enter the eye to contaminate the surgical field (Figure 2).

**Intravitreal injection.** During intravitreal injections, the contact of surgical instruments with eyelashes and eyelids has not occurred. An adequate surgical field can be secured, and injections can be completed without trouble. In clinical practice, the intravitreal injection of anti-vascular endothelial growth factor agents is increasing. Because this lid speculum is disposable and does not require sterilization, it is cost-effective in treating many patients.

**Vitreous surgery.** When using a wide-angle viewing system with a conventional lid speculum, the patient’s exhalations can leak from the space under the drape and sometimes cloud the lens. Our lid speculum design attaches completely and does not cause such problem. This lid speculum provides a somewhat tight surgical field for 23- or 25-gauge, three-port pars plana vitrectomy; however, compression and other treatments can be performed without problem (Figure 3).

**Glaucoma surgery.** In trabeculectomy, view of the surgical field is adequate, and the filtration bleb remains unaffected at the time of speculum removal. Appropriate draping prevents the prolapse of eyelashes into the surgical field and contamination of the surgical field from exposed eyelids and meibomian secretions. The newly developed speculum with a drape completely drapes the eyelashes and eyelids. It can be easily installed and removed, and the silicone material is friendly to eyelids and provides an adequate surgical field for the surgeon. Intra- and postoperative complications have not been seen. Because this new lid speculum is disposable and does not require sterilization, it is a cost-effective device.

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