



RECENT ADVANCES IN POSTOPERATIVE CARE



What ODs need to know about efforts to improve patient care after cataract surgery.

BY JUSTIN SCHWEITZER, OD, FFAO

The discussion of how to make the postoperative regimen for patients undergoing ophthalmic surgery simpler has been front and center lately. Specifically, there is an unmet need in postoperative drop regimens. According to one study that monitored patient adherence to their regimens after cataract surgery,

50% of patients took less than half of their prescribed medications, and 20% took less than a quarter.¹ In another study, 92.6% of patients improperly administered their eye drops, with issues including missing the eye (31.5%), instilling the wrong amount (64%), contaminating the bottle tip (57.4%), and not washing their hands (78%).²

As part of an effort to eliminate these gaps in care, use of intracameral injections after ophthalmic surgery has become popular, and studies have shown its benefit in reducing the risk of postoperative endophthalmitis.^{3,4} In this article I talk about two new drug delivery systems for use after cataract surgery that were approved last year by the FDA and one that has been around for a few years.

WHAT'S NEW

Dexamethasone Intraocular Suspension 9%

Dexamethasone intraocular suspension 9% (Dexycu, Eyepoint Pharmaceuticals) was approved by the FDA in February 2018 to be administered as a single intraocular dose behind the iris at the conclusion of cataract surgery for the treatment of postoperative inflammation. In an aqueous medium, dexamethasone intraocular suspension 9% forms a 2-mm sphere consisting of dexamethasone in a delivery vehicle of acetyltriethyl citrate.^{5,6} Initially, a high release of dexamethasone occurs, then it tapers rapidly over a 30-day period.^{5,6}

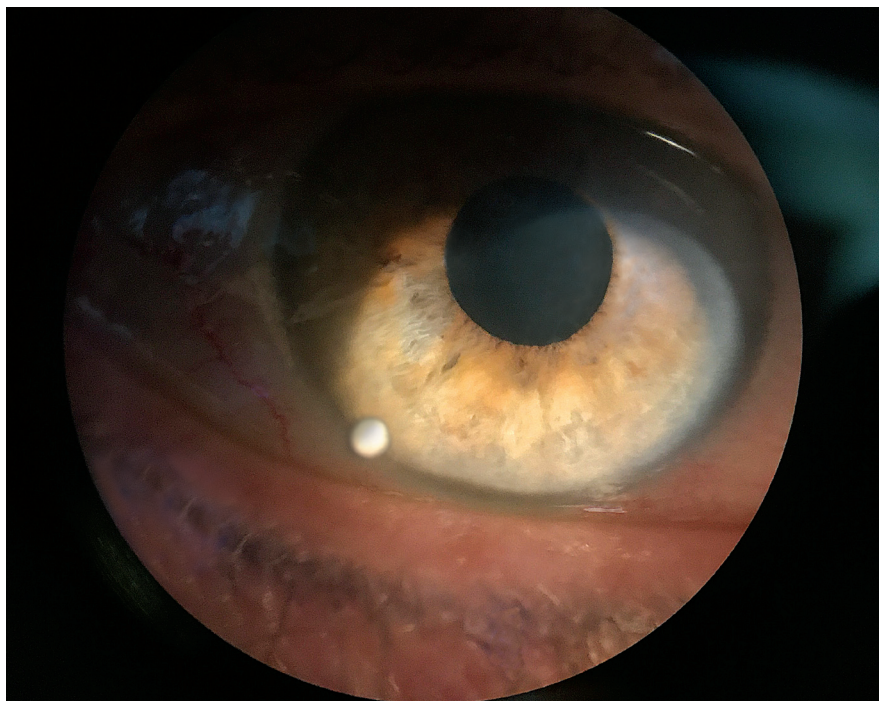


Figure 1. A sphere of dexamethasone intraocular suspension 9% is shown at day 1. Note that the sphere has migrated into the anterior chamber.

In a phase 3 placebo-controlled study of this therapy in patients undergoing cataract surgery, the primary outcome measure was anterior chamber cell clearing (grade 0) on postoperative day 8 in the study eye. Secondary outcome measures included anterior chamber flare (grade 0) and anterior chamber clearing plus anterior chamber flare (grade 0) in the study eye. The study found that 60% of study eyes achieved grade 0 anterior chamber cell,⁵ 89.1% of study eyes achieved grade 0 anterior chamber flare,⁶ and 67.3% of study eyes achieved grade 0 anterior chamber cell and flare, all at postoperative day 8.⁶ By comparison, 20%, 63.8%, and 33.8% of placebo eyes, respectively, achieved those same measures at that interval.^{5,6} The most common ocular adverse events, occurring in 5% to 15% of patients, included increase in IOP, corneal edema, and iritis.⁵

Postoperatively, the sphere of drug is white in appearance, and it may migrate and appear in the anterior chamber before dissolving completely (Figure 1). Over time it degrades as

dexamethasone is released until it is no longer visible. If the sphere does migrate into the anterior chamber, no intervention is needed.

Dexamethasone intraocular suspension 9% is injected in the OR. It has pass-through status and a J-code (J1095), which allows ambulatory surgery centers (ASCs) and hospital outpatient departments (HOPDs) to bill Medicare and other payers. The payment is over and above the facility fee paid to the ASC or HOPD for cataract surgery.

Dexamethasone Ophthalmic Insert 0.4 mg

Dexamethasone ophthalmic insert 0.4 mg (Dextenza, Ocular Therapeutix) was approved by the FDA in November 2018 for treatment of ocular pain following ophthalmic surgery. The insert is placed into the lower lacrimal punctum and into the canaliculus (Figure 2). In June, the FDA expanded the indications for the insert to include treatment of postoperative inflammation after ophthalmic surgery.

The dexamethasone ophthalmic



Figure 2. The shape of the dexamethasone ophthalmic insert 0.4 mg before insertion (top) and after it has been inserted and swells (bottom).

insert 0.4 mg is a resorbable intracanalicular hydrogel insert that enables sustained and tapered release of dexamethasone for up to 30 days.⁷ The preservative-free formulation is conjugated with fluorescein for visualization. As the insert swells in the presence of tear fluid, the vertical canaliculi is occluded, thereby concentrating drug release on the ocular surface.⁷

In three prospective phase 3, multicenter, randomized, parallel-arm, double-masked, vehicle-controlled studies of this therapy in patients undergoing cataract surgery, the primary outcome measures were absence of pain (grade 0) in the study eye at postoperative day 8 and absence of anterior chamber cells (grade 0) in the study eye at postoperative day 14. In pooled results of the three studies, 79.2% of study eyes (n = 539) achieved grade 0 for absence of pain at postoperative day 8, and 42.7% of study eyes achieved grade 0 for absence of anterior chamber cells at postoperative day 14.^{8,9} By comparison, 56.9% of placebo eyes (n = 385) achieved absence of pain on day 8 and 27.5% of placebo eyes achieved absence of anterior chamber cells on day 14.^{8,9}

The most common ocular adverse events were increased IOP (> 10 mm Hg above baseline) in 6.3% of study eyes versus 3.4% of placebo eyes and anterior chamber inflammation including iritis in 7.1% of study eyes versus 9.1% of placebo eyes.^{8,9}

Dexamethasone ophthalmic insert 0.4 mg currently has a C-code (C9048) that is payable in a surgical

(Continued on page 76)

(Continued from page 73)

environment such as an ASC or HOPD. The insert also has a procedure code, 0356T, insertion of a drug-eluting implant including punctal dilation and implant removal when performed into lacrimal canaliculus, each. Effective October 1, 2019, the insert will have a new J-code (J1096) for intracanalicular use that will allow payment in all settings of care, including the office. Optometrists who are familiar with placing punctal plugs will be able to use the insert in the clinical setting.

Phenylephrine 1%/ketorolac 0.3%

The combination of phenylephrine 1% and ketorolac 0.3% (Omidria, Omeros Corporation) was approved by the FDA in 2014 for the indication of reducing postoperative pain and maintaining pupil size by preventing intraoperative miosis. Effective October 1, 2019, the drug will have a J-code (J1097). Patients receive 4 mL of the

combination drug added to 500 mL of balanced salt solution intracamerally during cataract surgery.

In a study evaluating 223 patients randomly assigned 1:1:1 to receive vehicle, phenylephrine, ketorolac, or phenylephrine 1%/ketorolac 0.3%, superiority of the combination was demonstrated in comparison with either agent alone. The combination demonstrated significantly better maintenance of mydriasis and control of ocular pain compared with the vehicle, ketorolac, or phenylephrine.¹⁰

THINGS ARE LOOKING UP

The new delivery systems and techniques outlined here show promise for improving adherence to postoperative dosing regimens. They hold the potential to make postoperative care for our patients more straightforward and make it easier for patients to get the medications they need after ophthalmic surgery. ■

1. Hermann MM, Ustundag C, Diestelhorst M. Compliance with topical therapy after cataract surgery using a new microprocessor-controlled eye drop monitor. *Invest Ophthalmol Vis Sci*. 2005;46(13):3832.
2. An JA, Kasner O, Samek DA, Lévesque V. Evaluation of eyedrop administration by inexperienced patients after cataract surgery. *J Cataract Refract Surg*. 2014;40(11):1857-1861.
3. Braga-Mele R, Chang D, Henderson B, Mamalis N, Talley-Rostov A, Vasavada A; ASCRS Clinical Cataract Committee. Intracameral antibiotics: safety, efficacy, and preparation. *J Cataract Refract Surg*. 2014;40:2134-2141.
4. Shorstein NH, Winthrop KL, Herrinton LJ. Decreased postoperative endophthalmitis rate after institution of intracameral antibiotics in a Northern California eye department. *J Cataract Refract Surg*. 2013;39(1):8-14.
5. Dexycu [package insert]. EyePoint Pharmaceuticals. 2018.
6. Donnenfeld E, Holland E. Dexamethasone intracameral drug-delivery suspension for inflammation associated with cataract surgery: a randomized, placebo-controlled, phase III trial. *Ophthalmology*. 2018;125(6):799-806.
7. Dextenza (dexamethasone ophthalmic insert) 0.4 mg [package insert]. Ocular Therapeutix. 2018.
8. Walters TR, Bafna S, Vold S, et al. Efficacy and safety of sustained release dexamethasone for the treatment of ocular pain and inflammation after cataract surgery: results from two phase 3 studies. *J Clin Exp Ophthalmol*. 2016;7:1000572.
9. Tyson SL, Bafna S, Gira JP, et al; Dextenza Study Group. Multicenter randomized phase 3 study of a sustained-release intracameral dexamethasone insert for treatment of ocular inflammation and pain after cataract surgery. *J Cataract Refract Surg*. 2019;45(2):204-212.
10. Donnenfeld ED, Whitaker JS, Jackson MA, Wittmann J. Intracameral ketorolac and phenylephrine effect on intraoperative pupil diameter and postoperative pain in cataract surgery. *J Cataract Refract Surg*. 2017;43(5):597-605.

JUSTIN SCHWEITZER, OD, FFAO

- Vance Thompson Vision, Sioux Falls, South Dakota
- Co-Chief Medical Editor, *Modern Optometry*
- justin.schweitzer@vancethompsonvision.com
- Financial disclosure: Consultant (Eyepoint Pharmaceuticals, Ocular Therapeutix)