

WHEN YOUR DIABETIC PATIENT REQUIRES ANTERIOR SEGMENT ATTENTION



How to successfully manage patients with diabetes during cataract surgery.

BY NATHAN C. STEINLE, MD, AND CHARLES C. WYKOFF, MD, PhD

The prevalence of diabetes mellitus continues to increase in the United States. Dynamic population models predict that the total prevalence of diabetes will increase from 14% in 2010 to as much as 33% of the US adult population by 2050.¹ At the same time, the rate of cataract extraction, which is already the most commonly performed surgical procedure in the US Medicare population, continues to increase.² Worldwide, cataract and diabetic retinopathy (DR) are two of the top five leading causes of blindness,³ and patients with diabetes demonstrate earlier cataract formation than age-matched peers.⁴

Somewhat surprisingly, the intersection of cataract surgery and DR is not as well delineated as would be expected, and there has been surprisingly little cross-pollination between physician researchers who make a living in the anterior chamber and those who deal with the back of the eye. A review of the literature uncovers a dearth of prospective trials that provide guidance on the treatment of DR and diabetic macular edema (DME) in the perioperative period surrounding cataract surgery. Another limitation is the lack of a clear distinction between DME and pseudophakic cystoid

macular edema. This article offers our insights into caring for patients with diabetes who require additional care from our anterior segment colleagues.

EFFECTS OF CATARACT SURGERY

In previous decades, concerns arose that the inflammation associated with cataract surgery could lead to a breakdown of the blood-retina barrier, with release of inflammatory cytokines that could subsequently worsen DR and DME. Studies have

shown that cataract surgery exacerbates DR, increases DME, creates vitreous hemorrhages, and predisposes patients to anterior segment neovascularization.^{5,6} However, many of these studies were retrospective and included older, more traumatic surgical techniques such as intracapsular and extracapsular cataract extraction. Some more recent prospective studies have shown that uneventful phacoemulsification cataract surgery may *not* cause

AT A GLANCE

- Given the increasing prevalence of diabetes and rise in the number of cataract procedures performed each year, literature aimed at managing both conditions concomitantly is lacking.
- In the past there was concern that the inflammation associated with cataract surgery could lead to a breakdown of the blood-retina barrier, with release of inflammatory cytokines that could subsequently worsen DR and DME.
- Although no clear guidelines exist for the treatment of patients with DR and DME at the time of cataract surgery, modern phacoemulsification techniques, combined with appropriately employed pharmacologic agents and vigilant retina care, can afford patients the best possible outcomes.

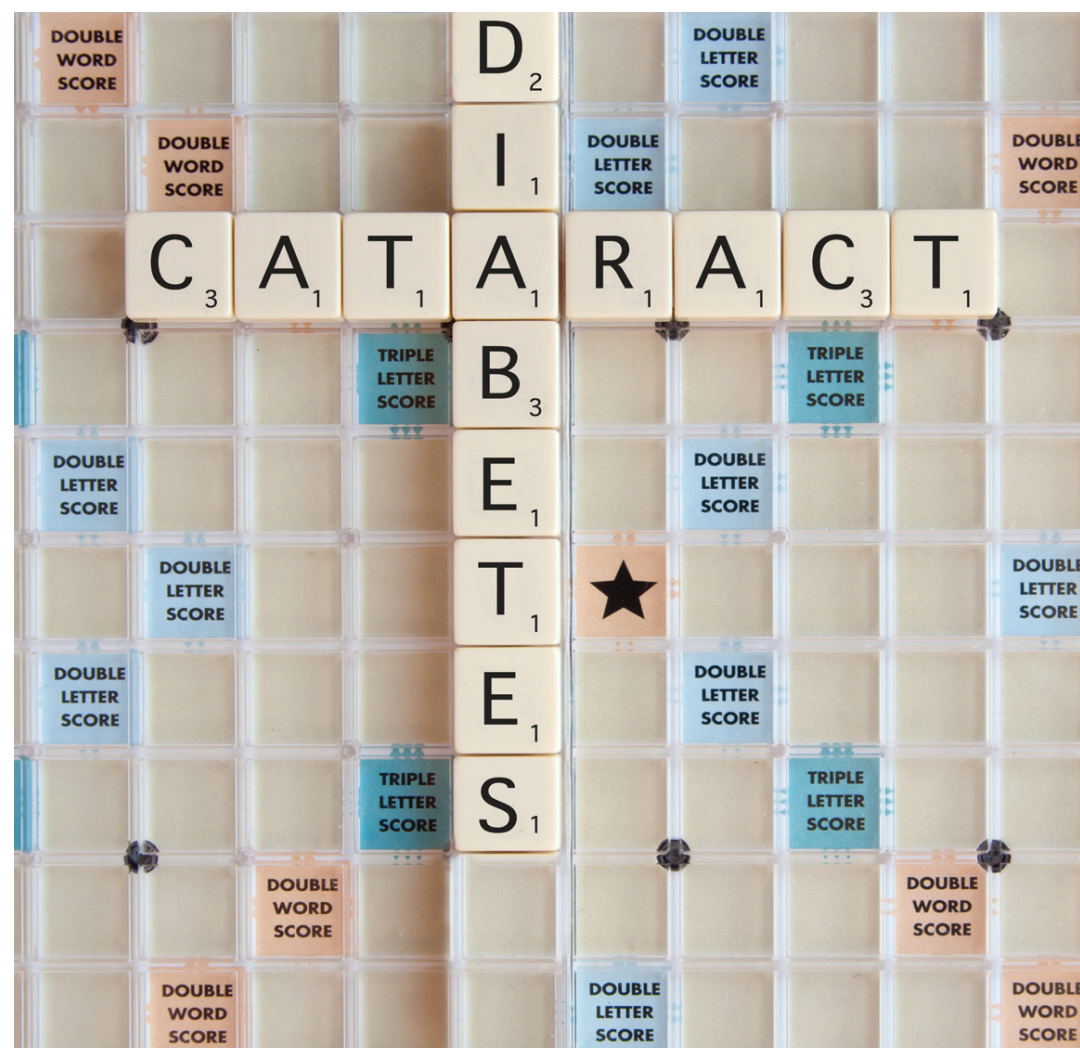
significant DR progression nor carry an increased risk of DME.^{7,8} Other recent studies, however, report that patients with diabetes, even those with no retinopathy, had an increased risk of new macular edema after cataract surgery, and that the risk of developing macular edema was higher in the presence of any DR and rose proportionately with increasing severity of DR.⁹

THE PERIOPERATIVE PERSPECTIVE

There is even less clarity regarding the timing and treatment of patients with preexisting DME in the perioperative period. Effective treatments for DME in the setting of cataract surgery include focal laser, topical steroids or nonsteroidal antiinflammatory drugs (NSAIDs), periocular steroid injections, intravitreal steroid injections, and anti-VEGF injections.¹⁰ As is often the case when there is a plethora of treatment options, there is no universally accepted best treatment option for patients with DME who require cataract surgery.

Lessons From the Literature

There is information to be gleaned from data from the phase 3 RIDE and RISE trials examining ranibizumab (Lucentis; Genentech) treatment in patients with DME.¹¹ There was no increase in the frequency of cataract surgery in patients receiving ranibizumab compared with those receiving sham injections. Among patients who underwent cataract surgery during the first 2 years of the studies, cataract removal was performed at approximately the same time for both sham and ranibizumab-treated study eyes (on average, around month 12). Furthermore, patients who received ranibizumab treatment for DME during the RISE and RIDE trials and did have cataract surgery did not experience worsening of vision. Similarly, the 148-week results of the VIVID and VISTA trials showed that aflibercept (Eylea; Regeneron)



injections for the treatment of DME were associated with minimal cataract formation and minimal need for cataract surgery.¹² Thus, as opposed to the known association of higher rates of cataract formation with intravitreal corticosteroid therapy for DME, anti-VEGF therapy with ranibizumab or aflibercept does not appear to increase cataract progression.

Other studies have also examined the use of anti-VEGF agents around the time of cataract surgery for the prevention or treatment of DME. In eyes with no baseline DME, several studies have shown promise in reducing macular edema rates after cataract surgery with prophylactic use of intraoperative ranibizumab or

bevacizumab (Avastin; Genentech).¹³⁻¹⁵ In eyes with DME, prospective studies have been conducted in which patients undergoing cataract surgery were assigned to receive either cataract surgery alone or cataract surgery combined with intravitreal bevacizumab.^{16,17} The bevacizumab-treated eyes had decreased retinal thickness and significantly improved visual acuity compared with control groups at month 3 in these trials. No ocular adverse events were observed when bevacizumab was injected intravitreally immediately after phacoemulsification. In another prospective study comparing intravitreal bevacizumab with intravitreal triamcinolone 4 mg administered at the conclusion of cataract

surgery, both bevacizumab and triamcinolone improved vision, but patients in the triamcinolone arm had a more sustained reduction in central macular thickness.¹⁸

Intraocular steroid implants have also shown promise. The dexamethasone intravitreal implant 0.7 mg (Ozurdex; Allergan) seems to blunt DME worsening for at least 3 months after phacoemulsification.^{19,20} One must use caution to minimize risk of anterior chamber migration of the dexamethasone implant, as the implant can cause significant corneal decompensation.²¹

Additionally, a post hoc analysis of data from the FAME study related to the fluocinolone acetonide intravitreal implant 0.19 mg (Iluvien; Alimera Sciences) for DME in the setting of cataract surgery has been completed.²² In most patients who underwent cataract surgery after injection of the implant, there was a net gain in vision from preoperative baseline and from original study baseline.

An Individualized Approach

Physicians should take an individualized approach to treating patients with DME in the perioperative period. Patients' systemic glycemic and hypertensive control should be maximized preoperatively. In the general population, the routine use of topical NSAIDs during cataract surgery is controversial.²³ In patients with diabetes undergoing cataract surgery, a large meta-analysis concluded that a combination of topical NSAIDs and topical corticosteroids reduced the odds of developing macular edema postoperatively compared with treatment with topical corticosteroids alone.²⁴ Two recent studies specifically investigating the topical NSAID nepafenac also showed benefits postoperatively.^{25,26}

Thus, the addition of NSAIDs to the cataract drop regimen can be considered, especially in patients with DR or DME. If there are identifiable

extrafoveal microaneurysms causing localized clinically relevant edema, focal laser can be considered.

However, if the macular edema is center-involving, then anti-VEGF agents seem to be well tolerated preoperatively, intraoperatively, and postoperatively. Intravitreal injection of corticosteroids is also a reasonable option, especially for patients without clinically significant intraocular pressure rises with past steroid exposure. Intravitreal steroid injections have the added benefit of increased duration of efficacy in the perioperative period.

DELIVER THE BEST CARE POSSIBLE

DR and DME need not be absolute contraindications to performing cataract surgery when clinically indicated. Distinct guidelines are lacking regarding an optimal treatment strategy for patients with DR and/or DME who require cataract surgery. Nonetheless, the prevalence of diabetes continues to increase, and we will see increasing interplay between these two areas of eye care. Modern phacoemulsification techniques, combined with appropriately employed pharmacologic agents and vigilant retinal care, can afford patients with diabetes the best possible visual and anatomic surgical outcomes. ■

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