Advances in Ophthalmology and Optometry 2 (2017) 135–148

ADVANCES IN OPHTHALMOLOGY AND OPTOMETRY

Managing Dense Cataract Emulsification

Abhay R. Vasavada, MS, FRCS (England)*,
Vaishali Vasavada, MS

Iladevi Cataract & IOL Research Centre, Raghudeep Eye Hospital, Gurukul Road, Memnagar, Ahmedabad 380052, Gujarat, India

Keywords

• Dense cataract • Phacoemulsification • Strategies • Effective • Predictable

Key points

- Dense cataract emulsification is a surgical challenge, and having a surgical technique that is effective, yet safe and predictable is important to ensure consistent outcomes time after time.
- The key difficulties in dense cataract emulsification include nuclear division, nuclear fragment removal without damaging the corneal endothelium or the posterior capsule, and repeatedly producing clear corneas and good unaided vision postoperative day 1.
- The technology must complement the surgeon's technique when emulsifying a dense cataract.

Video content accompanies this article at http://www.advancesinophthalmology.com.

INTRODUCTION

An encounter with a dense cataract can be demanding for both the surgeon and the patient. It is for this reason that phacoemulsification often is not preferred in very dense cataracts. During emulsification of dense cataracts, the difficulties that the surgeon is likely to face are poor visibility, stressful rotation, and difficult and incomplete division of the leathery lens fibers. There is an increased risk of

Financial Disclosures: Dr A.R. Vasavada receives research support grant from Alcon Laboratories, USA. Dr V. Vasavada has nothing to disclose.

*Corresponding author. *E-mail address:* icirc@abhayvasavada.com

http://dx.doi.org/10.1016/j.yaoo.2017.04.003

corneal endothelial damage being caused by the hard fragments repeatedly hitting the endothelium: risk of incurring wound site thermal injury (WSTI) because excessive ultrasound energy is used; and risk of posterior capsule rupture caused by the preset high parameters or a sudden occlusion break [1].

In this article, the authors aim to highlight the surgical paradigms as well as their preferred technique for successfully performing phacoemulsification in a dense cataract.

While emulsifying dense cataracts, significant factors that influence the surgical outcome are as follows: achieving a complete division of the leathery lens fibers, maintaining a posterior plane of emulsification, and low consumption of ultrasound energy. To achieve these, the procedure should be governed by the following paradigms.

IN-DEPTH ANALYSIS: SURGICAL PRINCIPLES OF DENSE CATARACT MANAGEMENT

Incision and anterior capsulorhexis

The smallest incisions compatible with the surgeon's phaco tip and instrumentation should be created. For the main temporal incision, a square or nearly square incision geometry is crucial in order to achieve a self-sealing incision. If the visibility of the capsule is compromised during capsulorhexis because of the poor red reflex, staining the anterior capsule with a vital dye such as Trypan blue improves visualization of the capsular flap (Fig. 1). The creation of a small rhexis (approximately 5 to 5.5mm) confines the floating of the hard fragments within the capsular bag and facilitates posterior plane emulsification. A large rhexis (greater than 6mm diameter) may result in fluid current induced propulsion of the divided fragments out of the bag and sometimes dangerously close to the endothelium. On the other hand, the surgeon should avoid making a rhexis that is too small (smaller than 5mm), which might endanger anterior capsular split during chopping.

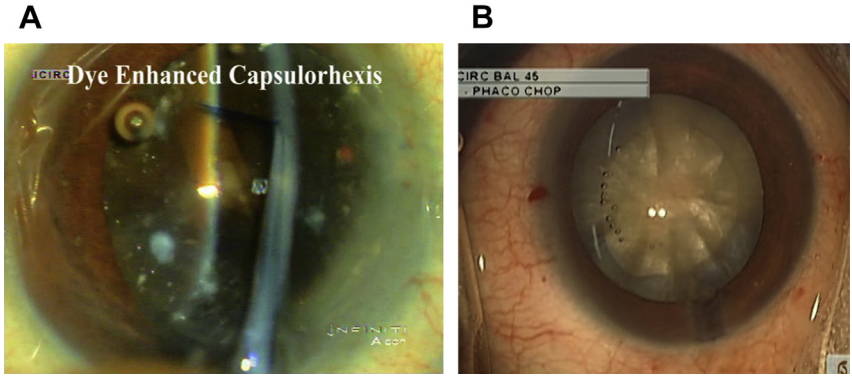

Fig. 1. (*A, B*) Trypan blue dye used to stain the anterior capsule in a dense cataract.