Chapter 2

Gas-Forced Infusion: The Solution for Surge

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History

The main problem we had in bimanual phaco/phakonit was the destabilization of the anterior chamber during surgery. We solved it to a certain extent by using an 18-gauge irrigating chopper. Then this author suggested the use of an antichamber collapser, which injects air into the infusion bottle. This pushes more fluid into the eye through the irrigating chopper and also prevents surge. Thus, we were able to use a 20 gauge or 21 gauge irrigating chopper as well as solve the problem of destabilization of the anterior chamber during surgery. Now with microphakonit because of gas forced infusion we are able to remove cataracts with a 0.7-mm irrigating chopper. Subsequently, we used this system in all our co-axial phaco cases to prevent complications like posterior capsular ruptures and corneal damage.

Introduction

Since the introduction of phacoemulsification by Kelman,[1] it has been undergoing revolutionary changes in an attempt to perfect the techniques of extracapsular cataract extraction surgery. Although advantageous in many aspects, this technique is not without its attending complications. A well-maintained anterior chamber without intraocular fluctuations is one of the prerequisites for safe phacoemulsification and phakonit.[2]

When an occluded fragment is held by high vacuum and then abruptly aspirated, fluid rushes into the phaco tip to equilibrate the built-up vacuum in the aspiration line, causing surge.[3] This leads to shallowing or collapse of the anterior chamber (Figure-2-1). Different machines employ a variety of methods to combat surge (Figure-2-2). These include usage of noncompliant tubing,[4] small bore aspiration line tubing,[4] microflow tips,[4] aspiration bypass systems,[4] dual linear foot pedal control,[4] and incorporation of sophisticated microprocessors[4] to sense the anterior chamber pressure fluctuations.

The surgeon-dependent variables to counteract surge include good wound construction