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Case Report

Revisiting Posterior Lens Capsule Fragility: From Clinical Observation to Safer Surgical Decision-Making

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Introduction

Cataract surgery remains one of the most successful and frequently performed procedures in modern medicine. Despite remarkable technological advances and refined surgical techniques, posterior capsule rupture (PCR) continues to represent a critical intraoperative complication, with potential consequences that directly influence visual outcomes and patient safety [1,2].

Traditionally, PCR has been viewed primarily as a technical event, often attributed to surgical inexperience or procedural missteps. However, growing clinical evidence and long-term observations suggest that this perspective may be overly simplistic.

Increasing attention has been directed toward the intrinsic structural properties of the posterior lens capsule itself, emphasizing its role as a key determinant of intraoperative vulnerability [3].

Anatomically and histologically, the posterior capsule is significantly thinner and mechanically more fragile than the anterior capsule. This inherent fragility is further modulated by multiple factors, including aging, axial length, metabolic disorders such as diabetes mellitus, and degenerative changes within the lens–capsule complex [4–6]. While these factors are well described in the literature, their practical integration into routine surgical planning remains inconsistent.

In contemporary cataract practice, surgical expertise remains indispensable.

Nevertheless, reliance on experience alone—without systematic consideration of capsule-related risk factors—may lead to variability in outcomes, particularly in complex or borderline cases. This underscores the need for a paradigm shift: from reacting to posterior capsule rupture once it occurs, toward anticipating vulnerability and implementing preventive strategies [7].

A patient-specific approach has therefore become essential. Individual variability in posterior capsule integrity necessitates thoughtful modification of surgical parameters, including phacoemulsification energy, fluidics, and nucleus management techniques. Early recognition of potential capsule weakness may also justify the proactive use of adjunctive measures to enhance intraoperative safety. Such individualized decision- making not only reduces the likelihood of PCR but also contributes to more predictable visual rehabilitation [8].

From a broader perspective, posterior capsule rupture represents the intersection of anatomy, technology, and surgical judgment. Technological innovation alone cannot compensate for insufficient understanding of the biological substrate upon which surgery is performed. Sustainable progress in cataract surgery depends

on harmonizing technical advancement with a deeper appreciation of capsular biomechanics and patient-specific risk profiles [9].

In conclusion, revisiting posterior lens capsule fragility should not be interpreted as a critique of current surgical practice, but rather as an opportunity for refinement.

Integrating clinical experience with evolving scientific evidence allows a shift from reactive management to proactive prevention. Editorial discourse plays a vital role in encouraging such reflection, ultimately fostering safer cataract surgery and improved patient outcomes.

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