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Ultrasound Features of the Kissing Choroidal Sign in a Four-Quadrant Hemorrhagic Suprachoroidal Detachment

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Abstract | **Case Report**

***Purpose*:** To report a rare case of four-quadrant hemorrhagic suprachoroidal detachment (SCH) with partial retinal detachment during cataract surgery, emphasizing the role of serial ultrasonography in diagnosis, monitoring, and surgical planning. ***Observations*:** A 75-year-old man with exfoliative glaucoma and well-controlled hypertension experienced a pre-expulsive SCH during cataract extraction following a capsular bag disinsertion and intraoperative hypertensive surge. Postoperative B-scan ultrasonography revealed four-quadrant dome-shaped choroidal elevations, progressing to a bilobed "kissing choroid" configuration by day 7, with minimal liquefaction. Serial ultrasonography guided timing of delayed surgical drainage, while topical and systemic corticosteroids were administered. Progressive resorption was observed at one month, although some detachment persisted. ***Conclusions*:** SCH with extensive choroidal detachment is a rare but severe complication of intraocular surgery. Serial ultrasonography is essential for diagnosis, monitoring liquefaction, assessing detachment extent, and determining optimal timing for surgical intervention. Awareness of risk factors, prompt recognition, and structured perioperative management can improve outcomes.

Keywords: Suprachoroidal Hemorrhage, Hemorrhagic Choroidal Detachment, Phacoemulsification, Cataract Surgery, Retinal Detachment, B-Scan Ultrasonography.

INTRODUCTION

Suprachoroidal hemorrhage (SCH) is a rare but potentially vision-threatening complication of intraocular surgery, resulting from accumulation of blood within the suprachoroidal space due to rupture of posterior ciliary vessels. Systemic and ocular risk factors include advanced age, glaucoma, zonular weakness, hypertension, and sudden intraoperative hypotony [1–3]. The incidence of SCH during modern cataract surgery is low (0.03–0.1%), but higher rates occur in complex procedures or eyes with predisposing pathology [2, 3]. Prognosis depends on the extent of detachment, retinal involvement, initial visual acuity, and occurrence of expulsive mechanisms. Imaging, particularly ultrasonography (B-scan and A-scan), plays a crucial role in diagnosing and monitoring SCH, guiding surgical timing [4–7]. This report describes a rare case of four-quadrant hemorrhagic SCH with partial retinal detachment during cataract surgery, emphasizing serial ultrasonography for diagnosis, follow-up, and surgical planning.

CASE REPORT

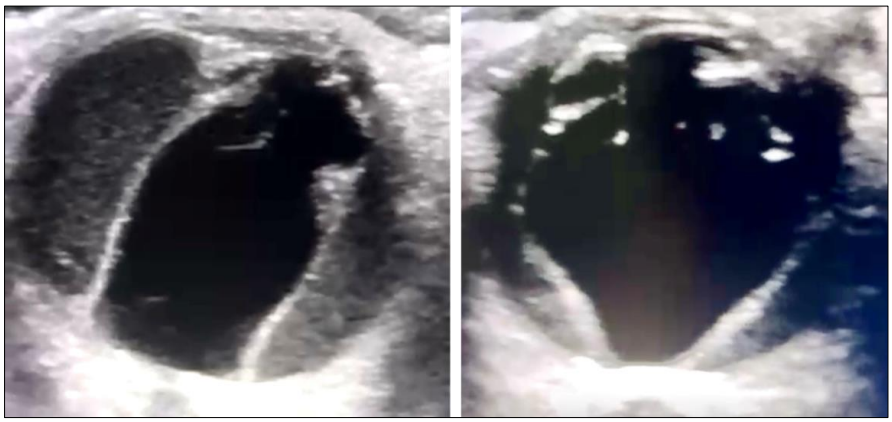
A 75-year-old man with severe exfoliative glaucoma and well-controlled hypertension underwent cataract extraction. Preoperative examination revealed no predictors of intraoperative complications. During surgery, a 250-degree capsular bag disinsertion occurred, necessitating conversion from phacoemulsification to intracapsular cataract extraction (ICCE). Toward the end of nuclear removal, a rapid hypertensive spike (BP 200/110 mmHg) precipitated a pre-expulsive SCH.

Intraoperatively, management included digital tamponade, rapid suture closure of incisions, loosening of the eyelid speculum, reverse Trendelenburg positioning, intravenous mannitol, and medications for elevated blood pressure and pain. Postoperatively, the anterior segment was clear; the patient was aphakic with light perception vision. Fundus visualization was limited, though partial superior retinal detachment was suspected.

Imaging Findings:

Postoperative day 1 (Fig. 1): B-scan revealed four dome-shaped choroidal elevations in all quadrants. A-scan showed high-amplitude reflective spikes with lower reflective echoes corresponding to clotted blood.

Postoperative day 7 (Fig. 2): The four domes coalesced into two thick-walled, mirror-image domes ("kissing choroid"), with persistent hemorrhage and minimal liquefaction



One month follow-up (Fig. 3): Partial resolution of hemorrhage with residual thickened domes, reflecting delayed clot liquefaction

Figure Legends

- **Figure 1:** Postoperative day 1 B-scan showing four dome-shaped elevations in all quadrants, consistent with hemorrhagic suprachoroidal detachment.
- **Figure 2:** Postoperative day 7 B-scan demonstrating coalescence of the four domes into two thick-walled, mirror-image domes ("kissing choroid"), indicating persistent hemorrhage with minimal liquefaction.
- **Figure 3:** One-month B-scan showing partial resolution of the hemorrhage and choroidal detachment, with residual thickened domes indicative of delayed clot resorption.

Postoperative management included topical corticosteroids, atropine, intravenous methylprednisolone, and serial ultrasonography. Indirect ophthalmoscopy complemented imaging once media clarity allowed assessment of hemorrhage location and progression.

DISCUSSION

Suprachoroidal hemorrhage (SCH) is an uncommon but potentially vision-threatening complication of intraocular surgery, resulting from the accumulation of blood within the suprachoroidal space due to rupture of long or short posterior ciliary vessels [1–3]. Its incidence during modern phacoemulsification is low (0.03–0.1%), but higher in complex cases or eyes with predisposing factors, including advanced age, exfoliative glaucoma, zonular weakness, systemic hypertension, and sudden intraoperative hypotony [1–3].

The risk is further increased when conversion from phacoemulsification to intracapsular cataract extraction (ICCE) or extracapsular cataract extraction (ECCE) becomes necessary [3–5]. Older techniques such as ECCE and ICCE are associated with higher rates of SCH compared with modern phacoemulsification due to greater intraoperative manipulation, larger incisions, and increased globe instability [5].

Clinically, SCH can manifest intraoperatively as anterior chamber shallowing, hardening of the globe, rapid progression of a posterior dark shadow, absence of the red reflex, elevation of intraocular pressure (IOP), posterior capsule stretching, and prolapse of intraocular contents including iris, lens, vitreous, or retina [2-5]. Postoperatively, patients may present with sudden ocular pain, decreased visual acuity, or perception of light only.

Imaging plays a pivotal role in confirming SCH, assessing its extent, configuration, and guiding the timing of intervention [6–9]. B-scan ultrasonography is the gold standard, revealing dome-shaped elevations corresponding to choroidal detachments, often with a "kissing choroid" configuration when domes touch centrally [6–9]. A-scan ultrasonography differentiates hemorrhagic from serous detachments based on characteristic high-reflective spikes from clotted blood, which evolve as liquefaction occurs [6–8]. Dynamic and serial B-scans allow monitoring of dome height, apposition, and liquefaction, providing critical guidance for the timing of posterior sclerotomy or drainage [7, 8]. Comparable ultrasonographic features have been reported in cases by Doniparthi *et al*., Rahma *et al*., and Yeung *et al*., demonstrating the utility of imaging in both diagnosis and surgical planning [9–12].

Differential diagnoses in the postoperative setting include retrobulbar hemorrhage, acute angle-closure glaucoma, serous choroidal effusion, posterior scleritis, and choroidal masses such as granulomas or hemangiomas [13]. A thorough history, particularly recent intraocular surgery, is essential for distinguishing SCH from these mimickers.

The prognostic impact of SCH depends on several factors. Poor visual outcomes are more likely with four-quadrant involvement, concomitant retinal detachment, intraoperative expulsive events, delayed clot liquefaction, initial perception of light vision, or posterior pole hemorrhage [5-10]. In our patient, four-quadrant hemorrhagic choroidal detachment with partial retinal detachment and delayed clot liquefaction required close monitoring with serial ultrasonography, allowing optimal timing for intervention without risking further expulsive complications.

Management strategies for SCH include immediate intraoperative stabilization, topical and systemic corticosteroids, and delayed posterior sclerotomy or drainage once clot liquefaction permits safe intervention [7-12]. Vitrectomy may be necessary for associated retinal pathology or persistent detachment. Stepwise protocols favor medical stabilization and careful imaging follow-up before attempting surgical drainage, unless urgent indications such as uncontrolled IOP elevation or anterior chamber obliteration arise [7-11]. Modern phacoemulsification generally provides more favorable outcomes compared to ICCE or ECCE, with reduced incidence of severe SCH [5-11].

Prevention and perioperative considerations are crucial. Comprehensive preoperative assessment, optimization of systemic blood pressure, management of glaucoma and elevated IOP, and avoidance of sudden hypotony or Valsalva maneuvers during surgery reduce SCH risk [1-7]. Intraoperative measures include appropriate patient positioning (reverse Trendelenburg), careful wound closure, gentle tissue manipulation, and rapid recognition of early signs of choroidal effusion or hemorrhage [1-7]. In glaucoma filtering procedures, partial-thickness scleral flaps are preferred over full-thickness approaches to minimize SCH risk [1].

In summary, this case highlights the rare occurrence of a four-quadrant hemorrhagic choroidal

detachment with a bilobed "kissing choroid" configuration following complicated cataract surgery. Serial B-scan and A-scan ultrasonography were essential for diagnosis, monitoring clot liquefaction, and guiding surgical intervention. Recognition of systemic and ocular risk factors, careful intraoperative management, and structured postoperative follow-up are critical for optimizing outcomes in such complex cases.

CONCLUSION

This case highlights a rare four-quadrant hemorrhagic SCH with bilobed "kissing choroid" configuration following complicated cataract surgery. Serial B-scan and A-scan ultrasonography was pivotal for diagnosis, monitoring clot liquefaction, and determining optimal surgical timing. Early recognition and careful echographic follow-up are essential for optimizing visual outcomes in complex cases.

Patient Consent: Written informed consent was obtained for publication of this case report and images.

Declaration of Competing Interest: The authors declare no competing interests.

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Ethical Approval: Ethical approval was not required for this case report according to journal guidelines.

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