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POSTER #16

Severe Ocular Surface Toxicity Following Prolonged Povidone-Iodine Exposure During Complicated Cataract Surgery

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BACKGROUND & PURPOSE

Povidone-iodine (PVP-I) is standard for endophthalmitis prophylaxis in cataract surgery. Cumulative toxic effects from repeated intraoperative application during prolonged procedures can cause severe ocular surface injury.

This case illustrates the clinical consequences and highlights prevention strategies.

CASE PRESENTATION

68-year-old male | Dense brunescent cataract

Intraoperative details:

- Posterior capsule rupture → anterior vitrectomy via limbal approach
- Total surgical duration: 75 minutes
- Standard 5% PVP-I preoperatively + repeated dilute PVP-I irrigations throughout procedure

Postoperative day 1 findings:

- Severe pain and photophobia
- Diffuse punctate epithelial erosions
- Schirmer test: 4 mm (preoperative: 12 mm)
- Tear break-up time: 3 seconds
- Persistent epithelial defect 3.2 x 2.8 mm by week 1

Impression cytology:

Grade 2 goblet cell loss with squamous metaplasia

TREATMENT & OUTCOMES

Treatment protocol:

- Intensive preservative-free artificial tears (hourly)
- Autologous serum eye drops 20%
- Therapeutic bandage contact lens

Outcomes:

- Complete epithelialization by week 4
- BCVA at 3 months: 20/30 (residual stromal haze)
- OSDI score at 3 months: 32 (moderate dry eye persists)

PREVENTION STRATEGIES

- Minimize total PVP-I contact time with ocular surface
- Ensure thorough saline irrigation after each application
- Consider lower PVP-I concentrations for repeated intraoperative use
- Pre-treat high-risk patients (dry eye) with prophylactic lubrication

KEY FINDINGS

Duration	Toxicity	Healing	Residual
75-min surgery PVP-I x multiple	Grade 2 goblet cell loss	Complete at week 4	OSDI 32 20/30 BCVA

Mechanism: Direct cytotoxicity + goblet cell destruction by cumulative PVP-I

CLINICAL PARAMETERS — TIMELINE

Parameter	Preoperative	POD 1	Week 1	Week 4	Month 3
Schirmer (mm)	12	4	3	7	9
TBUT (sec)	N/A	3	2	5	6
Epithelial defect	None	Diffuse PEE	3.2x2.8mm	Healed	None
OSDI score	N/A	72	68	45	32
BCVA	N/A	CF	HM	0.4	20/30

PEE = punctate epithelial erosions | CF = counting fingers | HM = hand motion

CONCLUSIONS

1. This case illustrates severe cumulative ocular surface toxicity from repeated PVP-I exposure during prolonged complicated cataract surgery, mediated through direct cytotoxicity and goblet cell destruction.
2. Despite complete epithelialization at 4 weeks, moderate dry eye (OSDI 32) and residual stromal haze persisted at 3 months, highlighting long-term sequelae.
3. PVP-I remains essential for endophthalmitis prophylaxis; however, total contact time should be minimized and thorough saline irrigation ensured after each application.
4. Lower PVP-I concentrations should be considered for repeated intraoperative use, particularly during prolonged procedures or in patients with pre-existing dry eye disease.

CLINICAL IMPLICATIONS

- Minimize PVP-I contact time in prolonged surgery
- Thorough irrigation after each PVP-I application
- Lower concentration for repeated intraoperative use
- Pre-treat dry eye patients before cataract surgery

KEYWORDS

Povidone-iodine | Ocular surface toxicity | Cataract surgery | Chemical keratopathy | Dry eye disease | Goblet cell loss

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