To Drain or Not to Drain? The Manchester Buckle Study

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Background

- Subretinal fluid (SRF) drainage during scleral buckle surgery for retinal detachment (RD) is controversial.
- Drainage leads to faster SRF resolution; however, it is associated with complications.
- We compared single surgery anatomical success (SSAS) and postoperative best-recorded visual acuity (BRVA) in the group with vs. without SRF drainage and determined drainage complication rate.

Methods

- A retrospective analysis of patients treated at the Manchester Royal Eye Hospital was conducted between 2008-2023.
- We collected demographic data, morphological and functional preoperative characteristics, operative management, intraoperative complications.
- Postoperative SSAS and BRVA were compared between groups with and without drainage in all eyes, macula on eyes, and macula off eyes.

Results

- We included 609 patients who underwent scleral buckling; 428 without SRF drainage and 181 with drainage.
- The drainage group had a higher proportion of macula off RDs (47.6% vs. 38.8%, p = 0.05) and differed in surgeon grade distribution, with more consultants performing drainage procedures (p < 0.01). Otherwise, preoperative characteristics were similar between both groups (Table 1).
- SSAS, postoperative BRVA were similar between groups with and without drainage in all, macula-on, and macula off eyes (Table 2).
- After adjusting for age, high myopia, trauma, type of RRD, macula status, surgeon grade, external SRF drainage was not independently associated with either postoperative BCVA (B = –0.023, 95% CI –0.093 to 0.048, p = 0.532) or SSAS (OR = 1.39, 95% CI 0.81–2.36, p = 0.23).
- Drainage related complications included 34 subretinal haemorrhages (18.8%), with 32 confined to the drainage site and 2 extending to the macula, which resulted in vision worsening. 11 patients (6.1%) required intravitreal air/gas for hypotony, and 2 patients (1.1%) developed iatrogenic tears.

Table 1. Pre-operative characteristics of a cohort of patients with and without drainage.

Preoperative characteristics	Drainage Group (n = 181)	Non-Drainage Group (n = 428)	p
Age (years, mean ± SD)	37 ± 11	36 ± 13	0.33
Laterality			
• Right Eye (%)	97 (53.5%)	214 (50%)	0.42
• Left Eye (%)	84 (46.5%)	214 (50%)	
Surgeon Grade			
• Fellow (%)	106 (58.5%)	334 (78.1%)	**< 0.01**
• Consultant (%)	74 (40.8%)	87 (20.3%)	
• Registrar (%)	1 (0.5%)	7 (1.6%)	
Macula Status			
• Macula On (%)	95 (52.4%)	262 (61.2%)	**0.05**
• Macula Off (%)	86 (47.6%)	166 (38.8%)	
Type of Retinal detachment			
• Dialysis (%)	40 (22.1%)	117 (27.3%)	0.16
• Break (%)	141 (77.9%)	311 (72.7%)	
Ocular Comorbidities			
• High Myopia (%)	29 (16.0%)	60 (14.0%)	0.52
• Trauma (%)	5 (2.8%)	28 (6.5%)	0.06
Pre-op BRVA (log MAR; all eyes)	0.65 ± 0.81	0.68 ± 0.82	0.85
Pre-op BRVA (log MAR; macula on)	0.11 ± 0.26	0.15 ± 0.21	0.56
Pre-op BRVA (log MAR; macula off)	1.25 ± 0.78	1.26 ± 0.82	0.94

Table 2. Postoperative outcomes of a cohort of patients with and without drainage.

Postoperative outcomes	Drainage Group	Non-Drainage Group	p
SSAS (all eyes)	157 (86.7%)	358 (83.6%)	0.67
Post-op BRVA (log MAR; all eyes)	0.29 ± 0.45	0.32 ± 0.51	0.47
SSAS (macula on)	86 (90.5%)	223 (85.1 %)	0.19
Post-op BRVA (log MAR macula on)	0.14 ± 0.22	0.14 ± 0.31	1.00
SSAS (macula off)	71 (82.5%)	135 (81.3%)	0.80
Post-op BRVA (log MAR macula on)	0.44 ± 0.42	0.54 ± 0.57	0.17

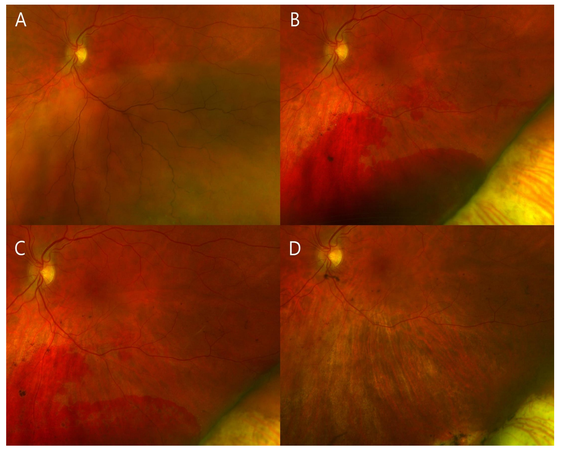

Figure 1. Subretinal haemorrhage in a patient who underwent scleral buckling and external drainage. Preoperative RD (A); Subretinal haemorrhage at 2 weeks (B), and at 2 months (C); Atrophy in the area of the subretinal haemorrhage 4 years post-surgery (D).

Discussion

- Drainage does not provide anatomical or functional benefits in scleral buckle surgery.
- The most common drainage-related complication is subretinal haemorrhage, which is usually confined to the drainage area.
- Drainage is relatively safe, with complications rarely leading to vision loss.
- Routine drainage during scleral buckling may not be justified; however, it can be useful in selected cases, such as extensive and bullous RD.

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Conflict of interests: Nil

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