

Efficacy of Secondary Bioactive Glass Obliteration for Chronically Discharging Radical Cavities

V.J. Kroon, MD^{1,2}, S.W. Mes, MD, PhD^{1,3}, P.A. Borggreven, MD, PhD¹, R. van de Langenberg, MD, PhD¹, D.R. Colnot, MD, PhD¹, J.J. Quak, MD, PhD^{1,2}

1. Department of Otolaryngology and Head and Neck Surgery, Diaconessenhuis Utrecht, Utrecht, The Netherlands

2. Amsterdam UMC location Vrije Universiteit Amsterdam, Department of Otolaryngology-Head and Neck Surgery, Amsterdam, Netherlands

3. Department of Otolaryngology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom.

Introduction

Canal Wall Down (CWD) surgery has several possible disadvantages, including water precautions, dizziness and chronic discharge or purulence. Secondary obliteration and reconstruction of the posterior wall of the external auditory canal could possibly help relieve the symptoms. We present the results of S53P4 Bioactive Glass (BAG) as material for secondary obliteration of troublesome radical cavities.

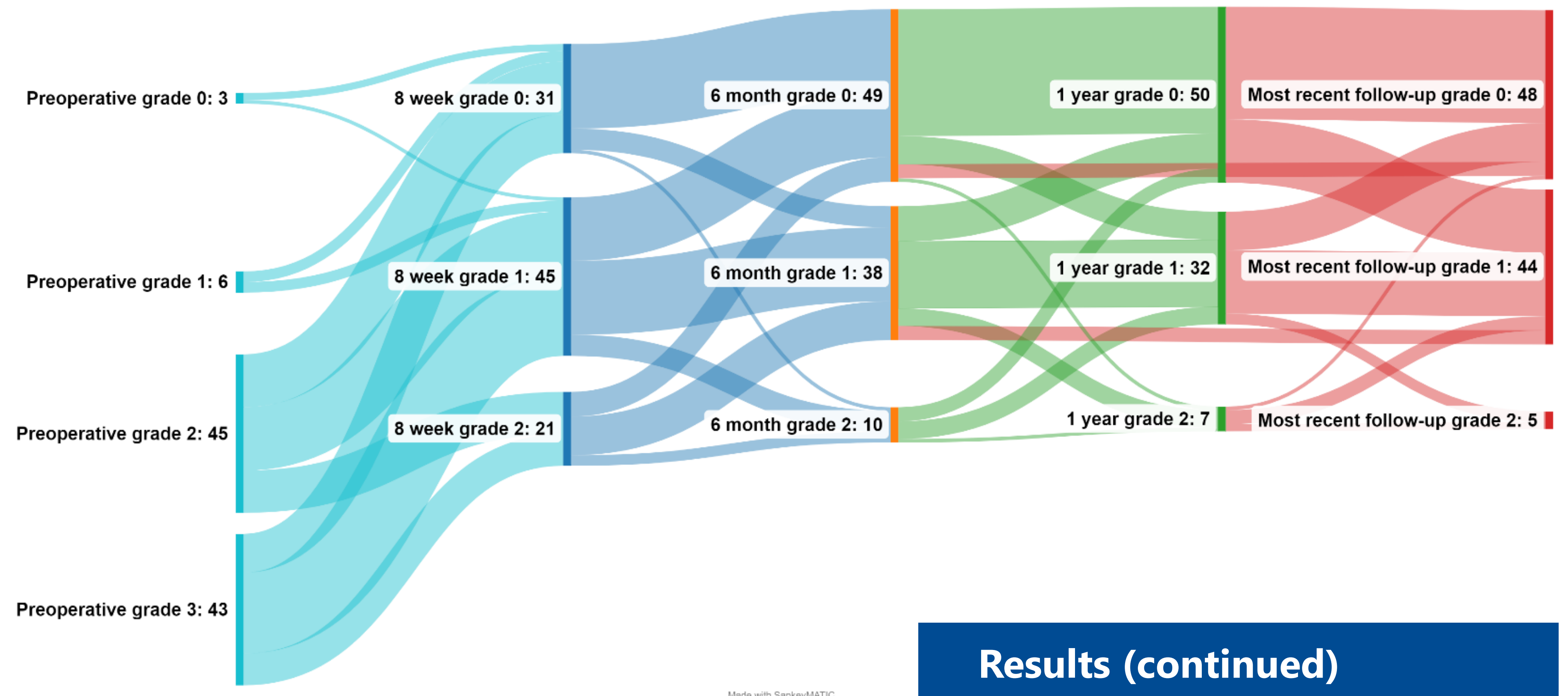
Methods

- Retrospective cohort study
- Between 2011 - 2022
- Previous CWD surgery
- Both adult and pediatric patients
- Cholesteatoma was excluded
- Intervention: Secondary obliteration using S53P4 BAG
- Outcomes: Surgical safety, Merchant grading for otorrhea, audiometry

Results

97 cases were included with a mean age of 51 years (SD14). The average time between the original CWD and secondary obliteration was 25.3 years. Intraoperatively, exposed important structures were seen in 47 cases, being dura (n=19), sinus (n=7), labyrinth (n=6) and facial nerve (n=30).

Postoperative complications were observed in 12% of cases (table), mainly minor and easily treated. In seven cases some form of revision surgery was necessary during follow-up.



Results (continued)

Median follow-up time was 3.9 years (range 0.5-10.4). Preoperatively, 91% of cases had frequent or continuous discharge. At the most recent follow-up moment, 95% of cases had a dry ear, as indicated by a merchant grade of 0-1. Audiometry was available for 78 cases (80%). Average improvement in air conduction was 3.1 dB for all patients and 11.2dB for patients that underwent PORP/TORP reconstruction. Closure of the ABG < 20dB was possible in 13/78 cases (17%).

Pure Tone Average (dB)	Word Recognition Score (%)										
	Improved			No Change				Worse			
	≥50	40	30	20	10	No Change	10	20	30	40	≥50
Improved											
40				1							
30		1		2	2						
20		1	1		7						
10	1	1	1		26	1					
No Change				1	5						
10					10				2		
20					3			1			
30											
40											
Worse											
≥50											

Postoperative complications, n (%)	
Minor	
Extrusion of ossicular prosthesis	2 (2)
Stenosis of the external ear canal	1 (1)
Otorrhea requiring oral antibiotics	3 (3)
Recurrent perforation tympanic membrane	4 (4)
Major	
Skin defect due to loss of BAG during healing requiring I.V. antibiotics	1 (1)
Cerebrospinal fluid leakage	1 (1)
Total	12 (12)

Conclusions

- Secondary obliteration using bioactive glass is safe and effective
- Few complications, seldom major
- Dry ear rate of 95%
- Limited hearing improvement, but ability to use hearing aids