Prophylactic Removal and Microbiological Evaluation of Calcified Plaques After Pterygium Surgery

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The authors have no financial interests to disclose.

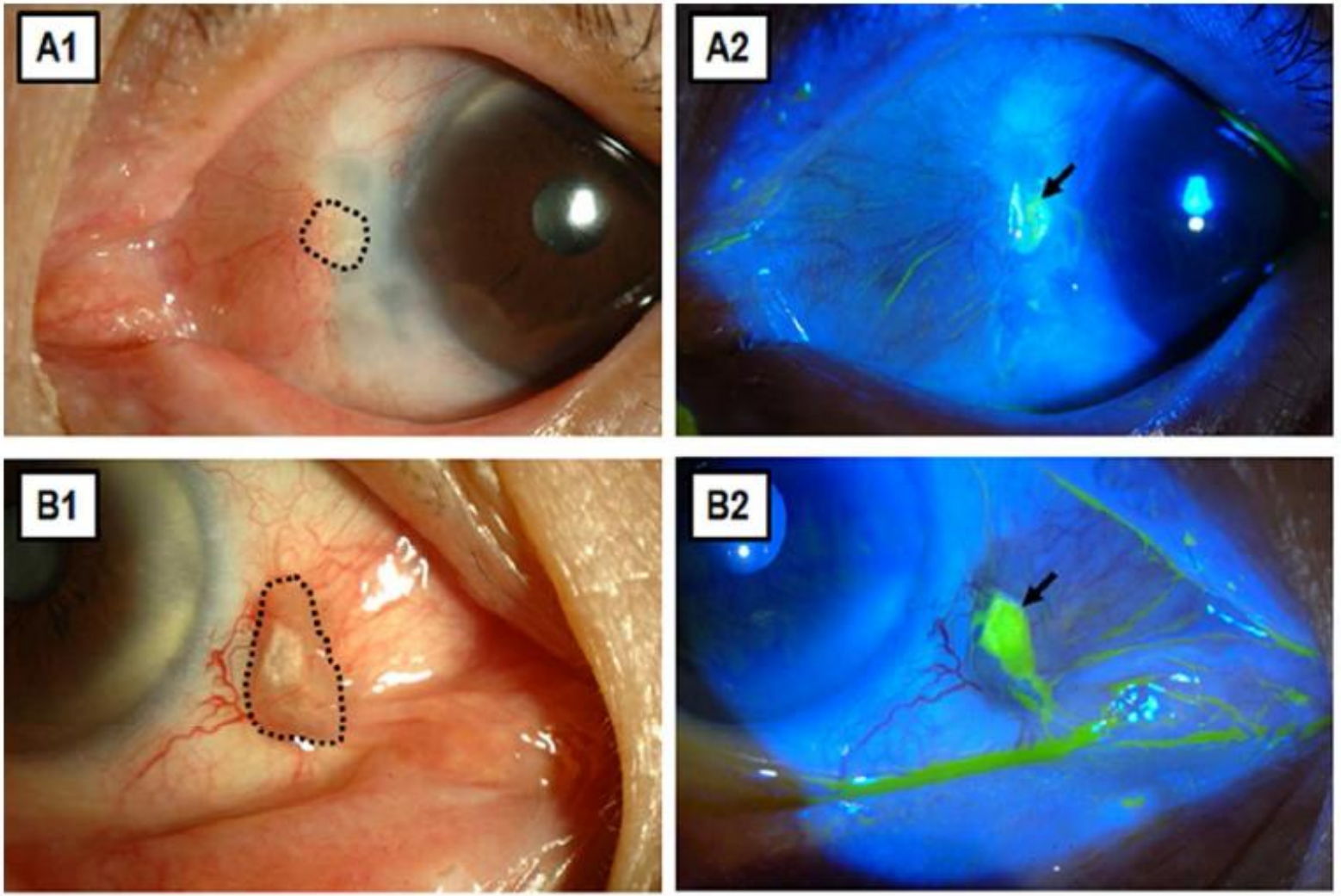
Purpose

- To investigate
  - Microbiological characteristics of prophylactically removed calcified plaques developed after pterygium excision
- To evaluate
  - Clinical outcomes of surface reconstruction for underlying scleral defects

Methods

- **Eligible patients**
  - Visit Seoul National University Hospital Between January 2010 and October 2011
  - Present calcium plaques after pterygium surgery
- **Removal of calcium plaques**
  - In patients who showed epithelial defect over the plques
  - Fourteen eyes of 13 patients
- **Microbiologic examinations for removed calcified plaques**
  - Smear: Gram and Gomorimethenamine silver stain
  - Culture: sheep blood agar, chocolate agar, Sabouraud dextrose agar with chloramphenicol, and brain-heart infusion broth
- **Surface reconstruction for scleral defect (scleromalacia)**
  - Small & shallow scleral defects: conjunctival autograft or amniotic membrane transplantation (filling technique)
  - Large & deep scleral defects: homologous scleral graft

Preoperative manifestations: examples



Dotted line: outline of calcified plaques
Arrows: epithelial defects over the calcified plaques

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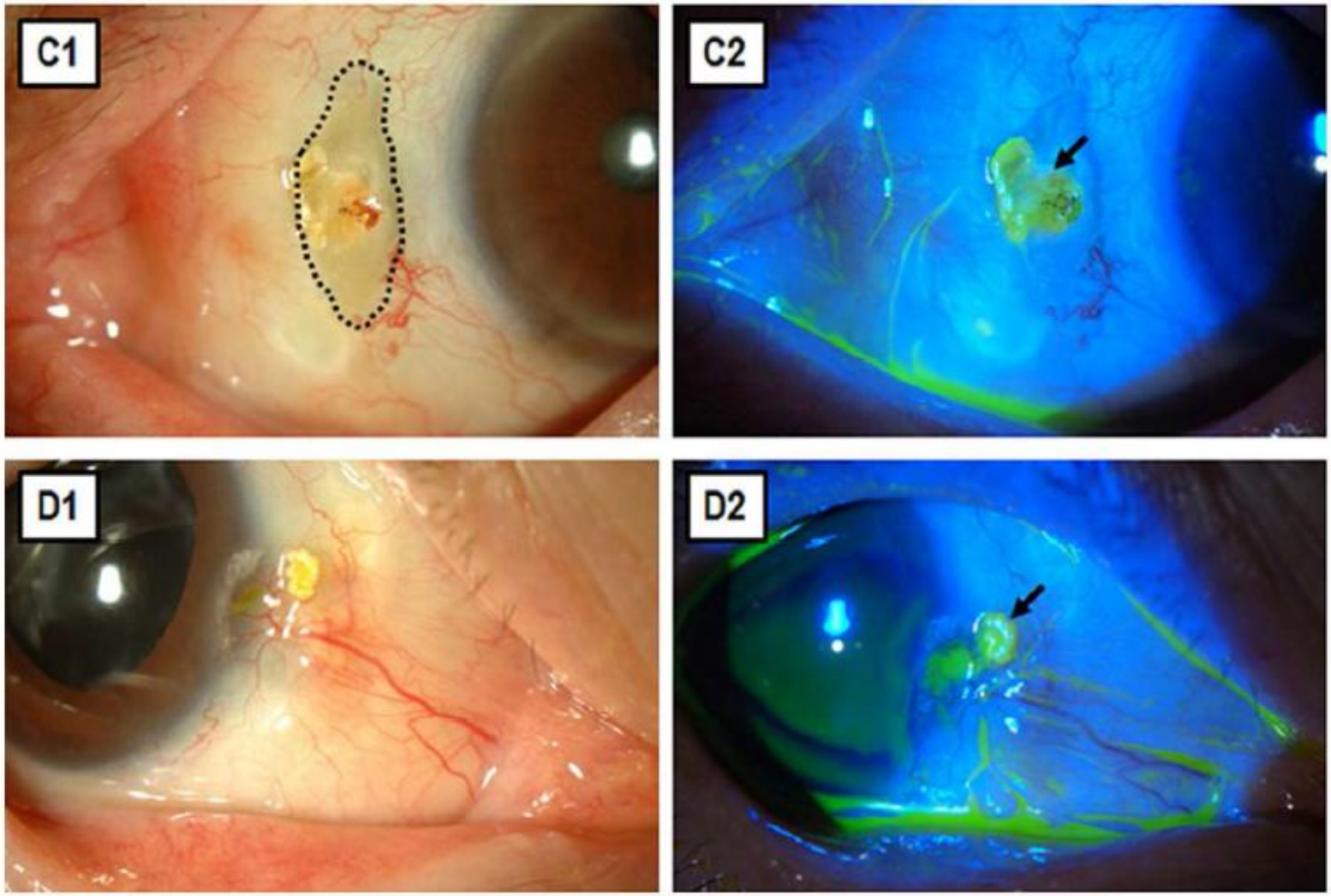

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Results

Demographics, surface reconstruction, and culture results

Culture positive rate: 35.7% (5/14)

Stenotrophomonas maltophilia: the most common

Case No	Sex	Age (yr)	Laterality	Latent period (yr)*	Scleral surface reconstruction	Pathogen	Size of epithelial defect (mm^2)	Size of calcified plaque (mm^2)	Postoperative complication
1	M	65	R	2	AMT	Gram-negative species (unidentified)	2	20	None
2	F	74	R	40	AMT	*S. maltophilia* *S. aureus*	2.4	3.75	None
3	F	79	L	4	AMT	None	5.1	11.25	None
4	F	78	R	10	Scleral patch graft	*Streptococcus* species, viridians group *S. maltophilia*	1.5	3.75	None
5	M	65	R	10	Scleral patch graft	*Corynebacterium* species	1.5	24	None
6	M	65	L	10	Scleral patch graft	*None*	3	6.6	None
7	F	72	R	40	None	*S. maltophilia*	0.96	4.5	None
8	F	70	R	10	AMT	None	0.75	3.36	None
9	F	71	L	27	Conjunctival autograft	None	0.7	2	Shrinkage of conjunctival autograft and small cyst formation
10	M	75	L	2	Scleral patch graft	None	0.4	5.04	None
11	M	67	R	40	AMT	None	0.3	2.2	None
12	F	58	R	23	AMT	None	0.5	7.5	None
13	F	74	L	20	AMT	None	3	12.5	None
14	F	74	R	31	AMT	None	1.5	12	None
Mean		70.9		19.9			1.69	8.46	

*Time interval between pterygium excision and calcified plaque removal

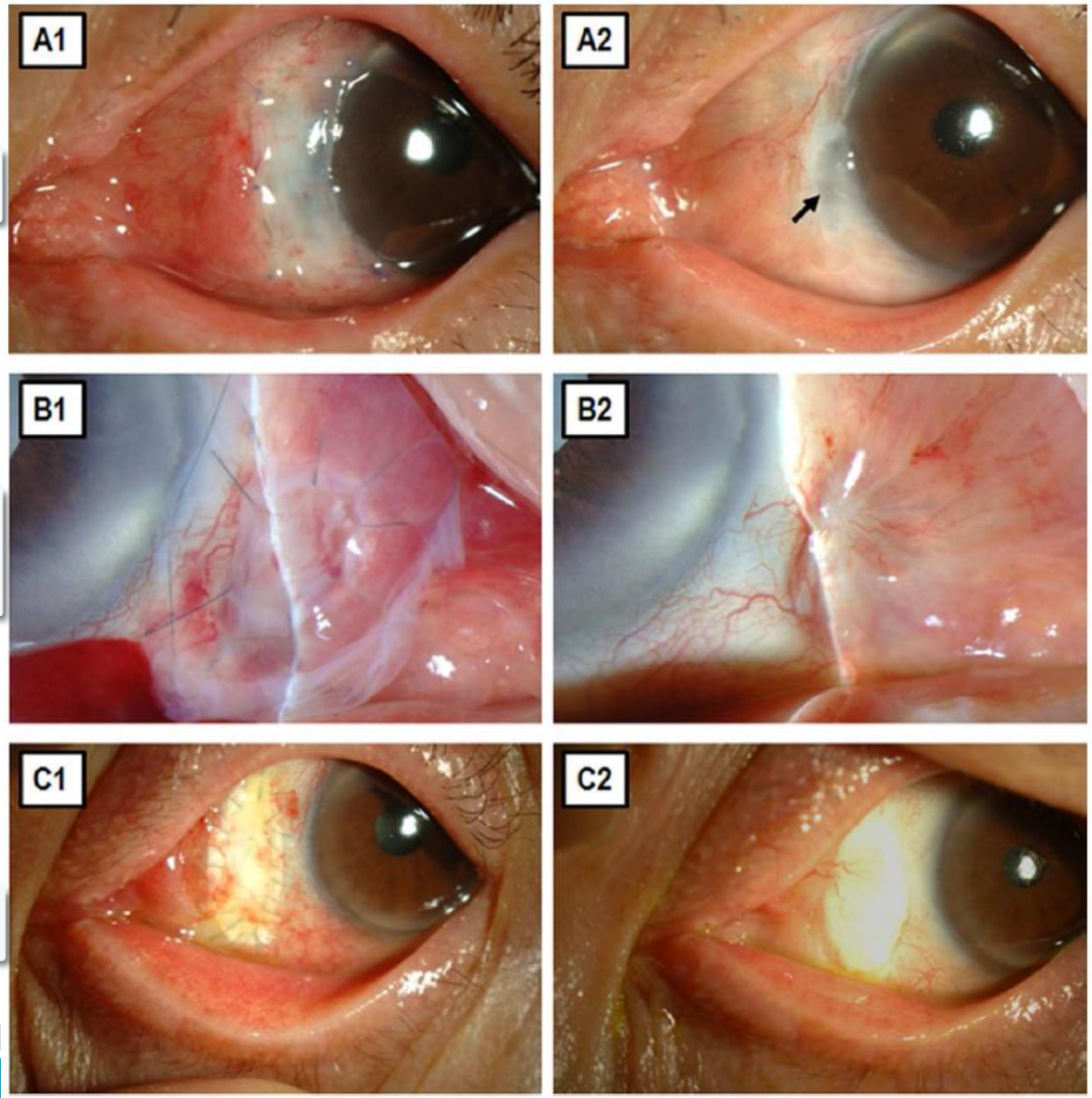
AMT = Amniotic membrane transplantation with filling technique; S. maltophilia = Stenotrophomonas maltophilia; S. aureus = Staphylococcus aureus

Surface reconstruction: examples

Conjunctival autograft

Amniotic membrane transplantation

Scleral patch graft



Culture positive vs. Culture negative (Risk factor analysis)

Size of calcified plaque: the only significant risk factor for growth of microorganism

	Culture positive (n=5)	Culture negative (n=9)	*P* value
Age (yr) at time of surgery	70.8 ± 5.72	70.3 ± 6.28	0.958
Male : Female	2 : 3	3 : 6	0.679
Latent period (yr)*	20.4 ± 18.2	18.6 ± 12.9	0.255
Size of epithelial defect (ED, mm^2)	1.67 ± 0.55	1.69 ± 1.66	0.577
Size of calcified plaque (CP, mm^2)	11.2 ± 9.96	6.93 ± 4.17	0.001†
ED/CP	0.28 ± 0.24	0.24 ± 0.15	0.591

All data represent the mean ± SD

*Time interval between pterygium excision and calcified plaque removal

†Mann-Whitney U test

Conclusions

- Calcified plaques after pterygium surgery
  - May develop and cause persistent overlying epithelial defect after a long time interval (Mean 19.9 years in this series)
  - Could play a role as infection sources (35.7% positive culture rate of microorganisms in this series)

- Risk factor for culture positive results
  - Size of the calcified plaques

➔ Prophylactic removal of the plaques and tectonic graft procedure for the underlying scleral defects should be considered, especially in large plaques