11-11-2021

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7:46 – 7:50 am

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Introduction: Dacryoliths of the lacrimal excretory system are found in patients undergoing surgical treatment of primary canaliculitis and nasolacrimal duct obstruction.[1,2] Dacryoliths of the canalicular pathway are classically attributed to *Actinomyces* species, yet a growing body of literature throughout Asia and the Middle East supports a shift towards *Streptococcus* and *Staphylococcus* species being the most common cultured organism.[1-4] The Midwest microbial profile in 2009 was reported to maintain *Actinomyces* as the most common organism.[1] The objective of this paper is to update the American Midwest demographic and microbial profile of lacrimal system dacryoliths to direct tailored regional approaches to treatment.

Methods: A retrospective chart review from January 2015 to 2021 of patients with history of surgical procedure for lacrimal removal of dacryolith were identified. Demographic and clinical information, microbial culture data and surgical pathology were obtained. Patients were included with canaliculitis, canalicular obstruction, dacryocystitis and nasolacrimal duct obstruction. Specimens were cultured for anaerobes and aerobes and dacryoliths underwent histopathologic evaluation with a combination of Gram, Gomori's methenamine-silver (GMS), Brown and Brenn Gram, and periodic acid-Schiff (PAS) stains.

Results: A total of 81 patients were identified, 48 (59%) were included in the study. Patients were excluded for incomplete chart or culture data (17%) or other foreign body removed, not dacryolith, (23%). There were 67 women (83%) and 14 (17%) men with a ratio of women to men of 5:1. Patient age ranged from 4-92 years (mean 64 years). All organisms were identified by frequency (Table 1). The most common organism isolated was *Actinomyces* spp (23%), followed by *Staphylococcus* spp (21%) and *Streptococcus* spp (19%). Histopathologic staining accounted for 45% of *Actinomyces* isolation when culture data was negative. In a subgroup analysis of 7 (15% of total) lacrimal sac dacryoliths, the most common organism was *Staphylococcus* spp (29%), no *Actinomyces* were isolated from the lacrimal sac and nasolacrimal duct (Table 2).

Conclusions: The microbial profile of Midwest dacryoliths maintains a predominance of *Actinomyces* spp in cases of canalicular pathology, in contrast to the regional shifts in microbial data reported around the world. Histopathologic evaluation aids significantly in fungal isolation likely due to slow or poor growth on culture. *Actinomyces* was not found in lacrimal sac dacryoliths in this study. Future prospective evaluation is needed to elaborate on these findings and their clinical significance in patient care.

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Table 1

Table 1: Dacryolith Microbial Analysis

Pathogen (n = 48)	Number of cases (%)
Actinomyces spp	11 (23%)*
Staphylococcus spp	10 (21%)
Streptococcus spp	9 (19%)
Fusobacterium nucleatum	4 (8%)
Peptostreptococcus spp	4 (8%)
Parvimonas micra	3 (6%)
Propionibacterium spp	3 (6%)
Serratia marcescens	3 (6%)
Fungal spp⁺	3 (6%)
Escherichia coli	2 (4%)
Prevotella spp	2 (4%)
Pseudomonas aeruginosa	2 (4%)
Gemella morbillorum	2 (4%)
*Histopathologic staining yielded 5/11 (45%) of positive cases	
⁺Includes one *Candida albicans*, one *Aspergillus fumigatus*, one non-specific yeast	
The following bacteria were positive in only one case (2%): *Proteus mirabilis, Klebsiella oxytoca, Enterobacter cloacae, Capnocytophaga sputigena, Aggregatibacter aphrophilus, Haemophilus influenzae, Stenotrophomonas maltophilia*	

Table 2

Table 2: Lacrimal Sac Dacryolith

Pathogen (n = 7)	Number of cases (%)
Staphylococcus spp	2 (29%)
Peptostreptococcus spp	1 (14%)
Serratia marcescens	1 (14%)
Escherichia coli	1 (14%)
Klebsiella oxytoca	1 (14%)
Fungal yeast forms	1 (14%)
Actinomyces spp	0 (0%)

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