EAR CANAL FOREIGN BODIES IN A SINGLE INSTITUTION'S EMERGENCY DEPARTMENT

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INTRODUCTION

Ear Canal Foreign Bodies (ECFB) are common presenting complaint to emergency departments, accounting for 0.05% of all emergency department visits, averaging 35.3 Ear Canal foreign bodies annually at the University of Missouri. ECFB are often superficial in the lateral 1/3 of external auditory canal (EAC), require non-urgent intervention, and are removed by primary care providers or emergency personnel. According to literature, when divided into "graspable" and "nongraspable" in children, success and complication rates of 64% and 14%, and 45% and 70%, respectively, have been reported [1]. To better understand our institution's management of ECFB, we are asking - **in a tertiary referral center, does foreign body removal success rate vary based on provider training level**? Secondary hypothesis include whether or not the rate of initial removal success varies between younger pediatric vs. older pediatric and adult patients?

METHODS

A retrospective chart review from 2005-2015 for all patients, aged 0-100 years, presenting to the University of Missouri Emergency Department and Women's and Children's Hospital Emergency Department presenting with a chief concern (CC) of ear foreign body was performed. Using ICD9 931, E915 and ICD10 T16.1XXA, T16.2XXA, TX16.9XXA codes captured 1083 patient records for review. Exclusion criteria of no notes available or no ear foreign body and CC resulted in **353 charts for review with CC of ear foreign body**.

Charts were reviewed and basic patient demographics (age, race, sex) were extracted. Subsequently, patients were divided into age groups of ≤12 and >12. Provider training types were divided into Emergency Department attending & resident physician, physician assistant, nurse practitioner, nurse, and medical student (ED Attn; R; PA; NP; N; and M4 respectively).

Initial attempts by outside providers were divided into Urgent Care attending physician, PA, nurse practitioner, and not otherwise specified (UC Attn; PA; NP; NOS respectively), Primary Care attending & resident physician, nurse practitioner, and not otherwise specified (PCP Attn; R; NP; NOS respectively), and Outside Hospital Emergency Department providers were often not delineated in the chart ergo grouped collectively as OH.

Success defined as complete foreign body removal on initial attempt. Success rates sub-analyzed between provider training level groups and age of ≤12 and age >12

Complications extracted from the charts excluded "retained foreign body" to avoid statistical redundancy as this metric captured mostly in success rate.

RESULTS

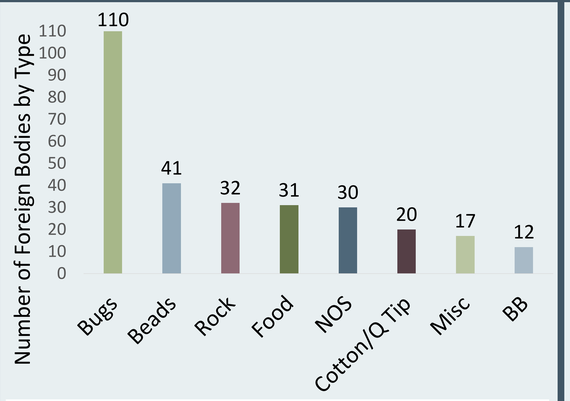

Figure 1 Number of Foreign Bodies Stratified by Type.
The 8 most common ECFB are quantified, with bugs being the most popular – n=110. In total, 64 FB were omitted from the chart, but not overall data analysis, such as jewelry, eraser, and hearing aid parts, among others.

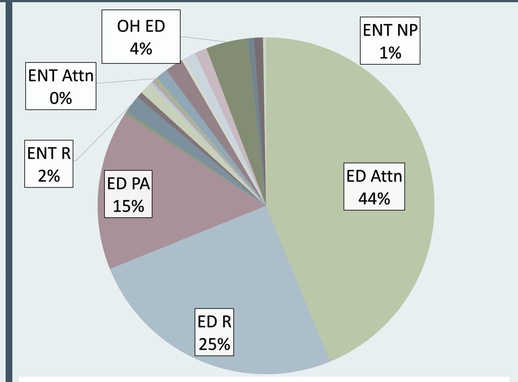

Figure 2 Percentage of ECFB Removals by Provider Type.
Most initial removal attempts were made by ED Attending, ED Resident, and ED PA. ENT NP and ENT Resident accounted for 1% and 2%, respectively, with 0% of initial attempts made by ENT Attending. Not specified – Urgent Care, Primary Care, or ED Nurse/NP as they all accounted for < 2% of attempts.

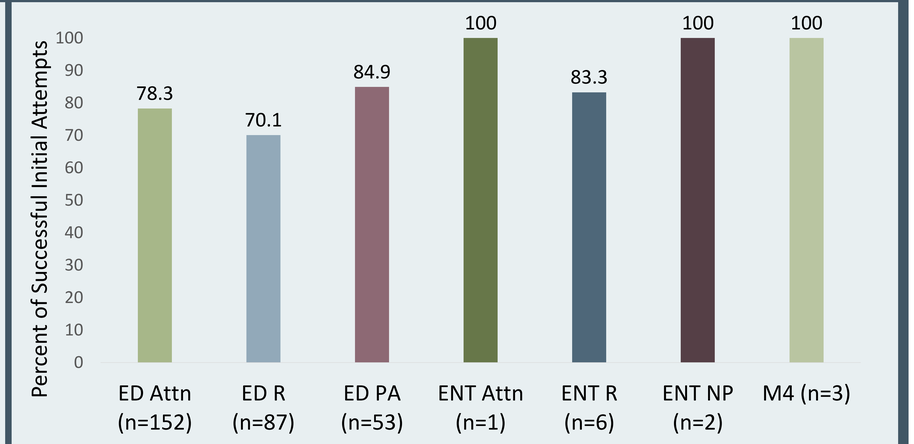

Figure 3 Percent of Successful Initial Attempts by Provider Type.
ENT Attendings, ENT NPs, and M4 Students all had a 100% success rate on initial attempt. ED Attendings, ED Residents, and ED PAs had 3 of the 4 lowest rates, but attempted to remove substantially more ECFBs.

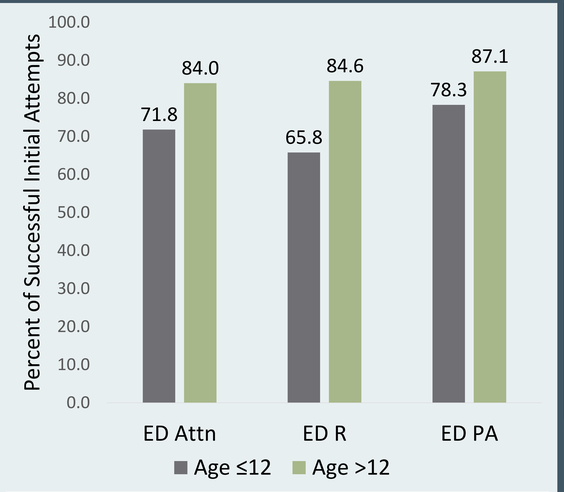

Figure 5 Percent of Successful Initial Attempts Stratified by Age and Provider Type.
The attempts by each provider type were stratified into 2 cohorts, ≤ 12 and > 12 years. ED PA had the highest rate among both cohorts. ED Resident and ED Attending had the lowest rate among ≤ 12 and > 12 years, respectively. No statistically significant difference was seen between provider types (p = 0.12-0.26).

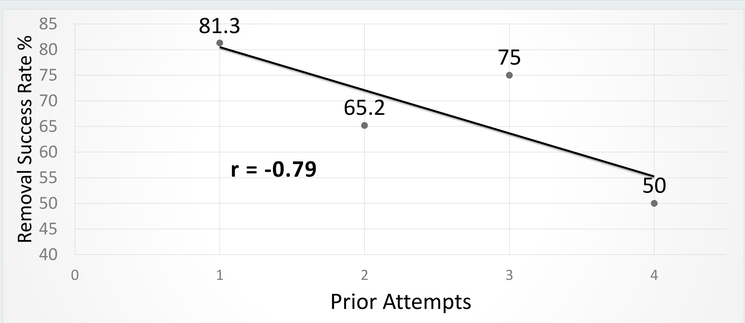

Figure 7 Success Rate of ECFB Removal by Number of Prior Attempts.
As the number of prior attempts increases there is a general decrease in the rate of success as evident by r = -0.79.

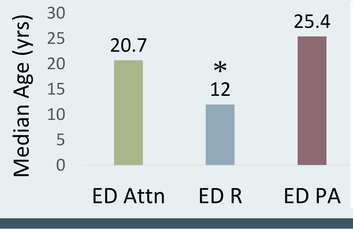

Figure 6 Median Age in Years of Patients with ECFB Stratified by ED Personnel Making Intitial Attempt.
The median age of patients seen by ED Residents was the youngest at 12 years. This was statistically younger, p = <0.01, than ED Attending (20.7 years) and ED PA (25.4 years). No statistical difference between the age of patients seen by ED Attending or PA.

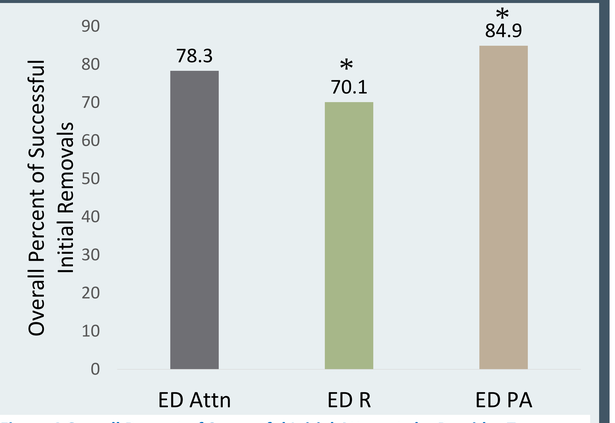

Figure 4 Overall Percent of Successful Initial Attempts by Provider Type.
Overall, ED Pas had the highest success rate of initial ECFB removal at 84.9%, and ED R the lowest success rate at 70.1%. This was a significant difference, p = < 0.01. No statistical difference otherwise.

CONCLUSIONS

- Overall Complication Rate was noted to fit the wide range in the literature – 8.2% at the University of Missouri vs. 1 - 48%.
- Emergency provider training level does not appear to affect removal success. Only significant difference between ED Physician Assistant and ED Resident likely due to significantly younger median age in the ED Resident cohort.
- Expected strong correlation between multiple prior attempts and successful subsequent removal without operative intervention.
- We are advocating for early cessation after initial removal failure and prompt ENT referral in order to avoid further trauma

FUTURE DIRECTIONS

- The next step is to complete statistical analysis of success rate based on ear foreign body type
- We are currently surveying data from University of Missouri Otolaryngology Clinics for success rates in order to develop local data-based practice guideline for ear canal foreign body triage and management

RESOURCES

1. DiMuzio J, Deschler D. Emergency department management of foreign bodies of the external auditory canal in children. *Otology & Neurotology*. 2002: (23); 473-475.
2. Thompson S, Wein R, Dutcher P. External auditory canal foreign body removal: management practices and outcomes. *Laryngoscope*. 2003: 113; 1912-1915
3. Schulze S, Kerschner J, Beste D. Pediatric external auditory canal foreign bodies: a review of 698 cases. *Otolaryngology-Head and Neck Surgery*. 2002: 127(1); 73-78