

Otitis Media prior to Cochlear Implantation; an evaluation of history taking across the life-course.

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Introduction

Cochlear implants are neuro-prostheses which are surgically inserted into the cochlea to restore hearing function in individuals with persistent profound to severe hearing loss. The factors affecting hearing performance and implant success are poorly understood. Otitis media is associated with increased cochlear implant complications and the effect of peri-implantation otitis media on cochlear implant performance is not fully understood. Macrophage priming, a mechanism of innate immune memory, can lead to developing maladaptive immune responses. In the context of otitis media and cochlear implants early life middle ear inflammation could predispose individuals to aberrant immune responses to cochlear implantation and subsequently affect wound healing and hearing performance. **Exploration of the relationship between historic otitis media and cochlear implant outcomes requires reliable documentation of middle ear histories prior to implantation.** This project evaluates documentation practice for a history of otitis media at University of Southampton Auditory Implant Service (USAIS).

Methods

Records from 718 cochlear implant cases at USAIS spanning nearly a decade were accessed. The data for the 562 patients that met the criteria for inclusion was reviewed for evidence of recording of middle ear history. 156 cases were excluded due to either implant surgery at a different clinic, or other incomplete health history. Cochlear implant recipients were considered to have a documented history of otitis media if specific terms were found in clinical documents. Records were assessed for middle ear health factors including; middle ear investigations, history of otological surgery, middle ear damage and symptoms and treatments of otitis media. Ethical approval (ref 62161) was granted by the Faculty of medicine ethics committee, Southampton.

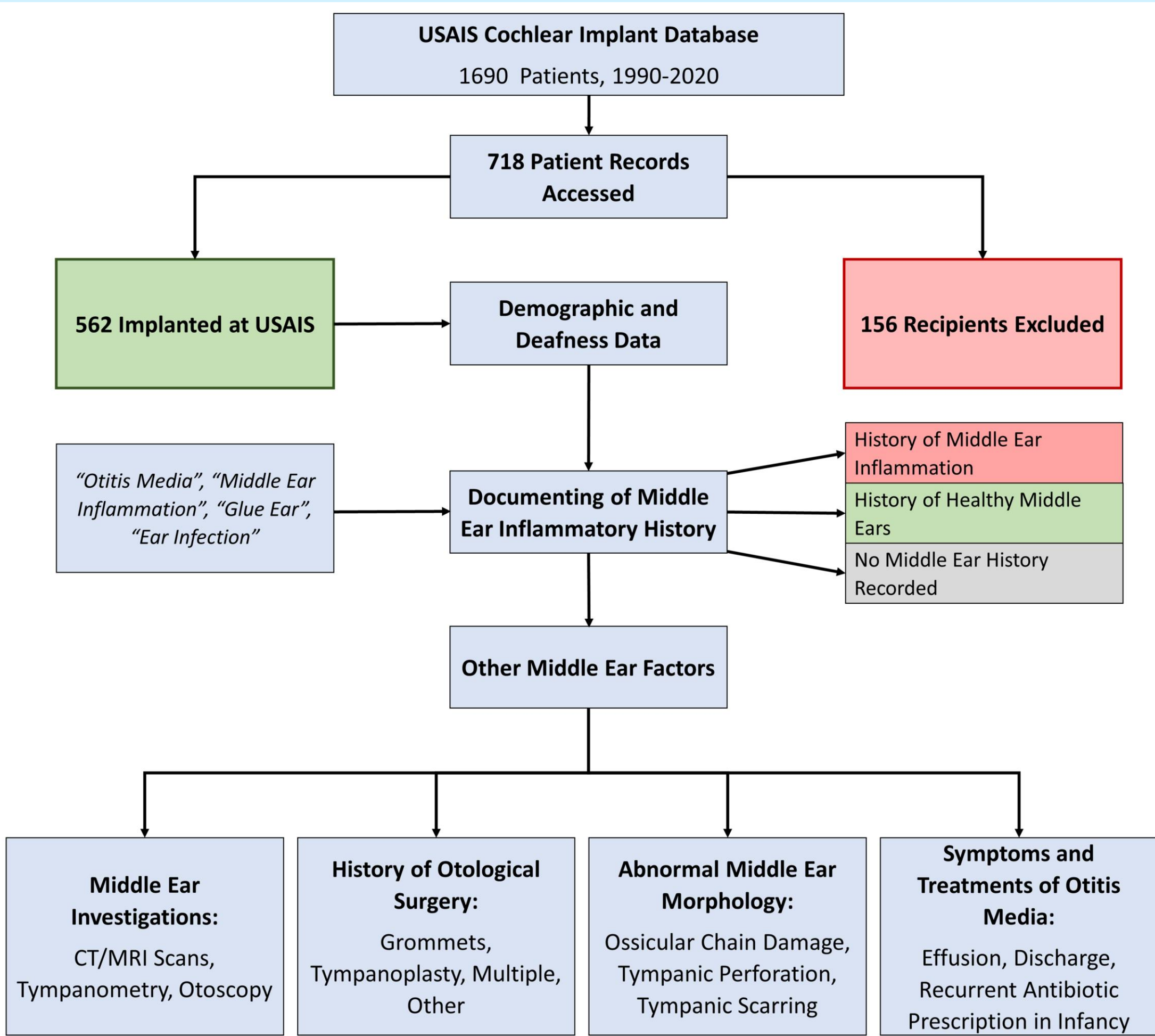


Figure 1. Flowchart illustrating the process for data collection including the number of participants evaluated, the terms utilized for documenting middle ear inflammation and other factors relating to the middle ear which were also collected.

Outcomes

- There is incomplete recording of middle ear history and Otitis media prior to cochlear implantation.
- Recording is more complete for children than adults.
- Some recipients who have had otitis media are not documented as having had a history of otitis media.

Conclusion

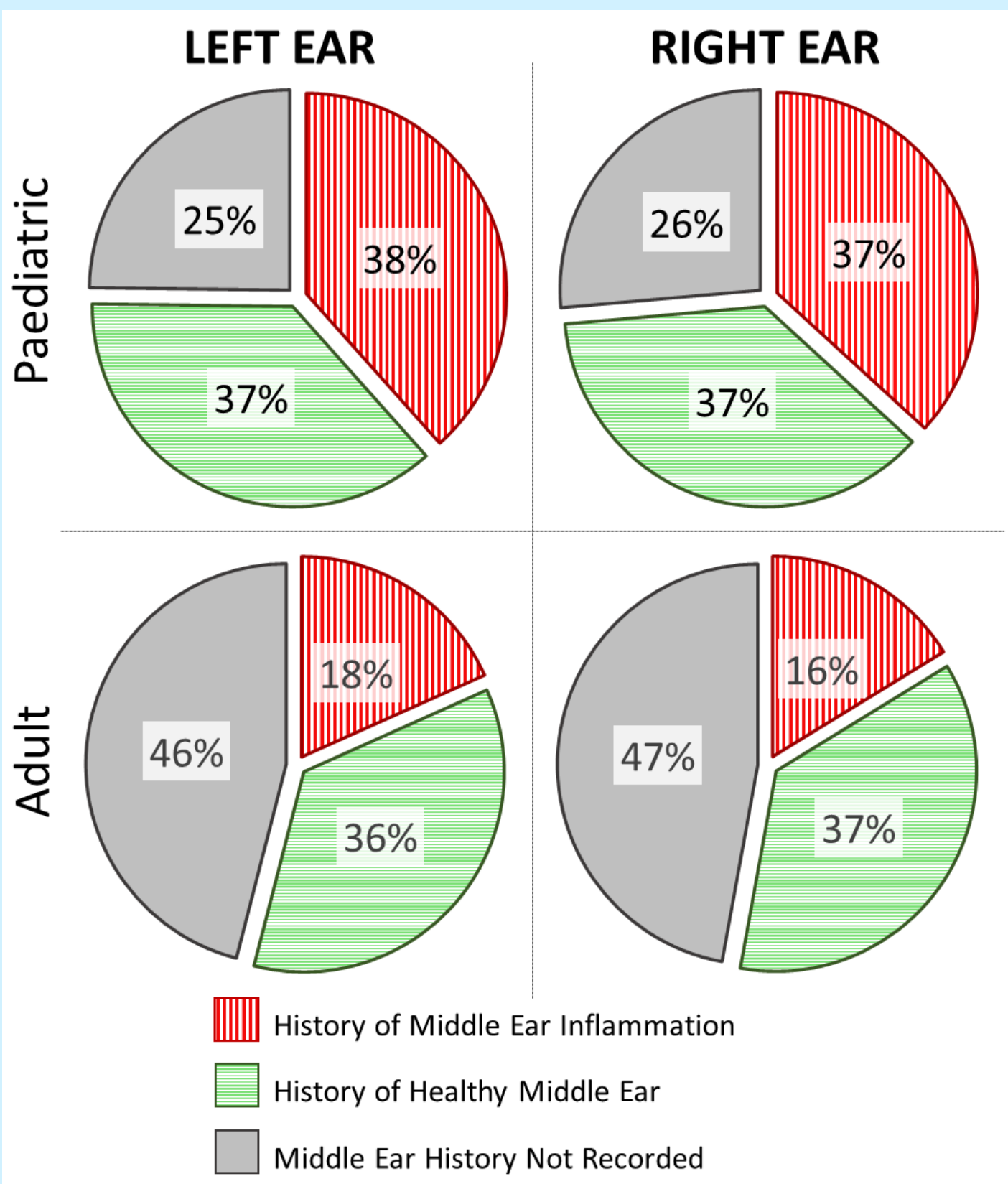
Analysis of the documenting of middle ear inflammatory histories at USAIS prior to implantation has identified that a history of otitis media has not been recorded for all patients. Due to coincidence of otitis media and the peak of cochlear implantation in children, there is as predicted, more thorough documentation amongst the children. Reliable, consistent recording of otitis media irrespective of patient age at time of implantation is needed so that the role of early-life middle ear inflammation as a prognostic factor and its effect on cochlear implant performance can be determined. Understanding this relationship may in the future facilitate research into strategies to improve hearing performance with an implant and deepen understanding of the mechanisms by which prior immune insults affect cochlear implantation outcomes.

Results

a. Documentation Practice

There is a difference in practice of documenting middle ear histories between children and adult recipients (Figure 2). The documentation is more complete for paediatric recipients than adults.

Figure 2. (see right) Visual comparison of documenting practice of otitis media histories between adult and paediatric cochlear implant recipients.



b. Otological Surgery

Middle ear health factors were analysed and several recipients who had prior otitis media were not documented as having had it. For example looking at histories of surgery (Figure 3); around 10% of recipients who had been recorded as having healthy middle ear histories, and around 10% of those without documented middle ear histories, had histories of prior middle ear surgery. The most common procedure was for grommets suggesting histories of middle ear inflammation.

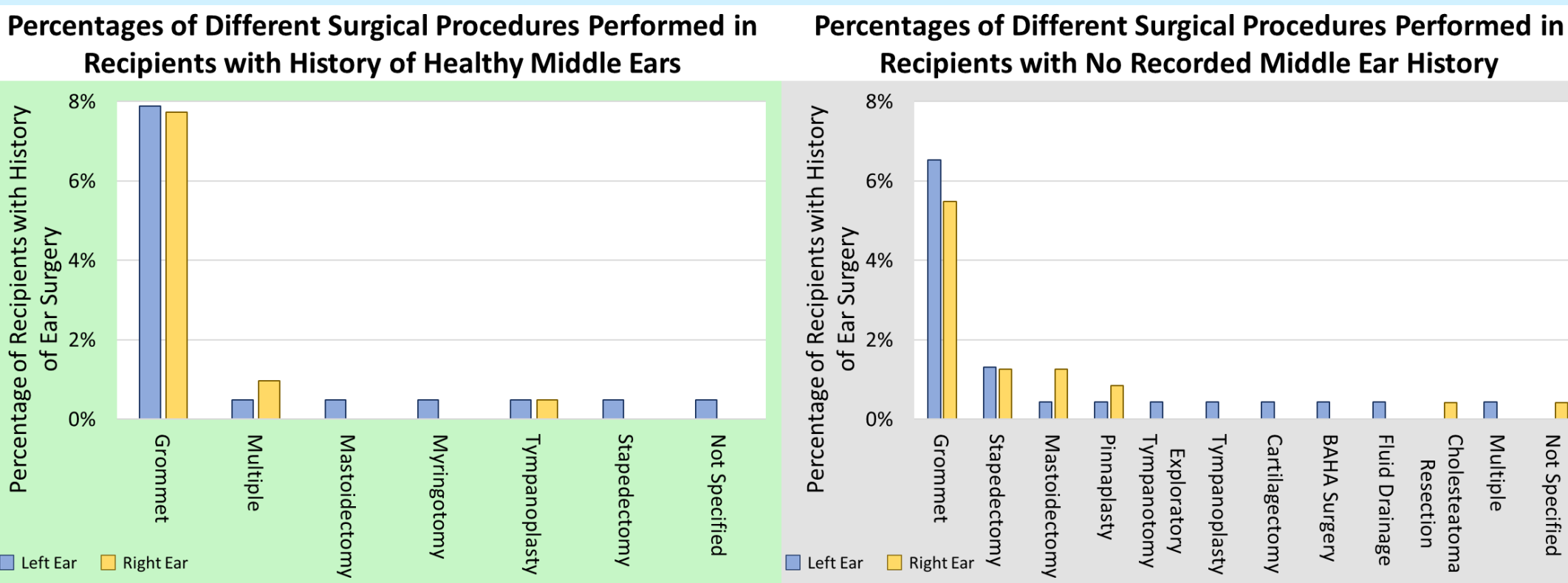


Figure 3. Surgical procedures performed in cochlear implant recipients who were documented with histories of healthy middle ears, or with no history documented.