

Earmould-induced allergic contact dermatitis leading to novel earmould material: A case study

Kieran Fereday¹, Dr Lorraine Lewis¹ & Paul Clark²

¹Audiology Department, University Hospital of Wales

²CAD/CAM Technology Department, University Dental Hospital of Wales

Introduction

An 86-year-old female with Alzheimer's disease previously diagnosed with left moderate hearing loss and single sided deafness (SSD) in the right ear, attended the walk in repair clinic at University Hospital of Wales Audiology department. She reported that the left earmould material was causing allergic contact dermatitis. The patient has 30+ known allergies to several materials, including various plastics, gold, silver, and titanium which was discovered by the Dental department years previously. The Audiology earmould manufacturer were not able to provide a material which the patient not allergic to. Audiology contacted the Dental Hospital CAD/CAM team who were able to recommend a denture manufacturer who identified Valplast® (nylon based) as the material for the new earmould.

3D mould process

The CAD/CAM specialist 3-D scanned the patient's earmould impression using a digital blue light scanner, thus creating a 3-D rendering. Some manipulation to the design was needed via the use of sophisticated CAD software before the earmould version was formed in wax via a 3D printer. The wax version was then encased in a dental gypsum plaster mould and using the 'lost wax process' technique, the wax version was removed using boiling water to leave a cavity behind to the same dimensions of the original wax version. An injection moulding process was used by the denture manufacturer to create a Valplast® earmould and Audiology drilled in the sound bore hole as it could not be inserted during the final manufacturing process.

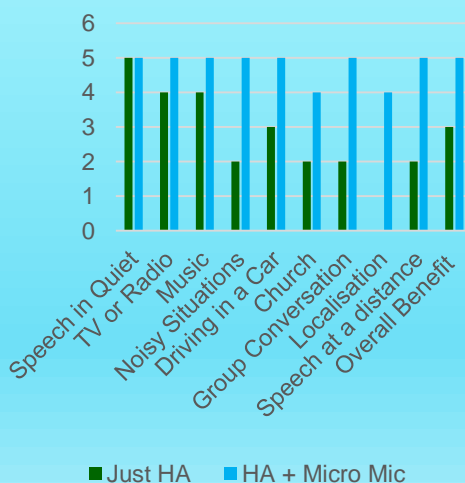


Micro mic fitting for unilateral hearing loss

The Valplast® mould was fitted in conjunction with a micro-mic and the BBSS questionnaire was completed with the patient and her daughter. Lower scoring situations were typical of those experienced by people with SSD.



BERN Benefit in Single Sided Deafness (BBSS)



BBSS results:

Results, 8 weeks after the fitting of Micro mic showed an increase in satisfaction for 9/10 listening situations in comparison to just the hearing aid alone.

Patient reported outcome measure (PREM) free text:

"I want to thank the department for going above and beyond to help my mum gain a resolution to her allergic reaction."

All other questions showed very high satisfaction with the services received from Audiology and Dental.