EasyView OtoBlock

Innovative new OtoBlock enables deeper impression taking

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Introduction

- Ear canal anatomy is unique across individual (see Fig 1).

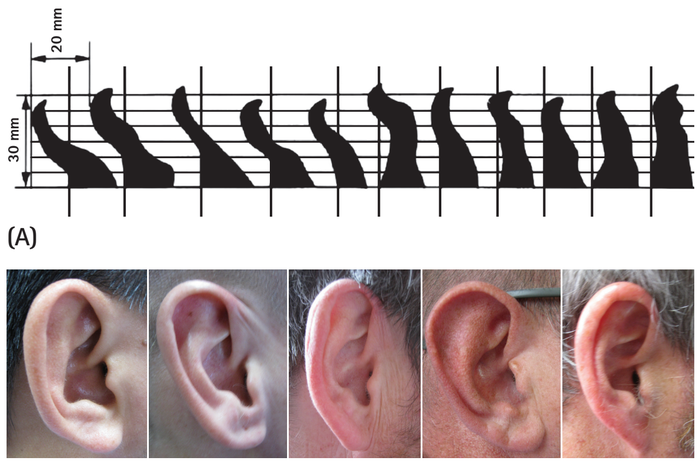

Fig 1: (A) Cross sections of 11 different ear canals detailing the different anatomy (From Schwartz, 2015); **(B)** photos of different external ears.

- Accordingly, crafting optimal custom hearing solutions requires impressions detailing full information of the pinna and external auditory meatus extending past the second bend.
- Standard OtoBlocks (SOB) made from materials such as cotton wool and foam are opaque, providing the clinician with no information past their medial tip during placement, especially regarding canal direction and distance from the eardrum.
- The EasyView OtoBlock (EVOB) is a new innovation that supports deeper impression taking. It utilises a hollow symmetrical seal and has an angled window at the end enabling visualisation of the canal and eardrum beyond the medial tip of the OtoBlock during placement using an Otoscope (Fig 2). Its hollow vent tube also mitigates any pressure vacuum, improving comfort during removal.

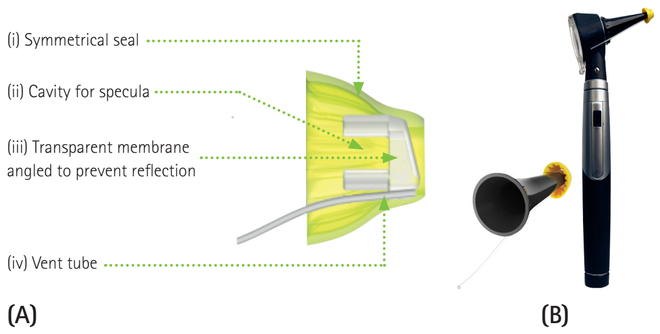

Fig 2: (A) Anatomy of the EVOB showing: (i) symmetrical seal; (ii) Hollow cavity for the specula; (iii) Transparent membrane (angled to prevent reflection) and (iv) Vent tube. **(B)** Placement of EVOB on otoscope prior to insertion into the ear.

Given the EVOB is hollow, it fills with impression material, expanding against the canal wall and becoming part of the ear impression.

Fig 3: Ear impression taken with the EVOB showing full anatomy and good information beyond the second bend and how the EVOB becomes part of the impression which we can scan and use for modelling.

- Previous validation data collected on 22 participants indicates an average improvement in ear canal length of 5.5mm with EVOB versus SOB (Schwarzlos Sooprayen, 2017).

Aims

To replicate the findings of the Schwarzlos Sooprayen (2017) validation study with a larger group of clinicians.

Method

- We ran workshops with experienced Clinical Audiologists when we launched the EVOB in NZ.
- 44 took impressions of the same ear using a SOB and the EVOB (total of 88 ear impressions for analysis).
- Clinicians were free to choose which ear they took the impressions from and which block they used first.
- Impressions were taken according to standard clinical protocol. Welch Allyn otoscopes were used. Impression material was either OtoformA softX used with a Dreve impression gun or Otoform AkX and a standard ear impression syringe. Otolights were used for SOB placement. Welch Allyn paediatric speculae (Ø 2.4-3 mm) were used for EVOB placement.
- Ear impressions were scanned then aligned and compared in our rapid shell modelling application in order to measure the ear canal depth with the SOB and the EVOB (see Fig 4).

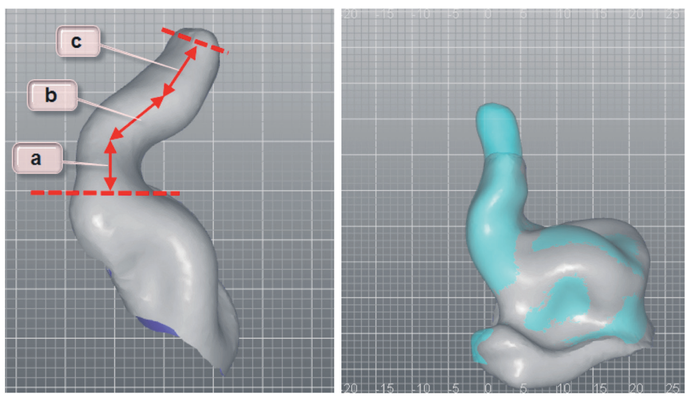

Fig 4: (A) Technique for measuring the absolute canal length in the current study. a + b + c = absolute canal length with SOB. **(B)** Align and compare of impression taken with the SOB (grey) and the EVOB (light blue). In this case the EVOB has enabled an additional 7mm canal depth. Note: grid lines are 1mm.

Results

- Interestingly, 64% of clinicians spontaneously chose to take impressions from the right ear.
- Results show that ear impressions taken with the EVOB were on average 3.2mm, or ~30%, longer than those taken with the SOB. A paired sample t-test inidicates that impressions taken with the EVOB were significantly longer that those taken with SOB (P <.001).

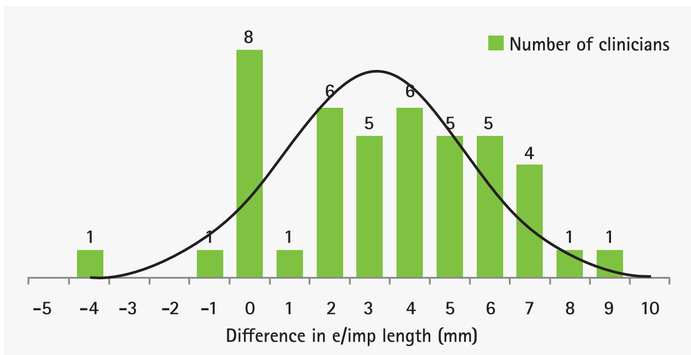

Fig 5: Histogram showing the difference in ear impression length (mm) for the 44 clinicians at the workshop. Positive numbers indicate deeper impression with EVOB.

- A regression analysis comparing the length of impressions taken with the EVOB versus SOB indicate a positive, significant correlation (p <.001). When the linear regression best fit is compared to unity in Fig 6, this shows that in general the additional length provided by the EVOB was greater when the impression taken with the SOB was shorter.

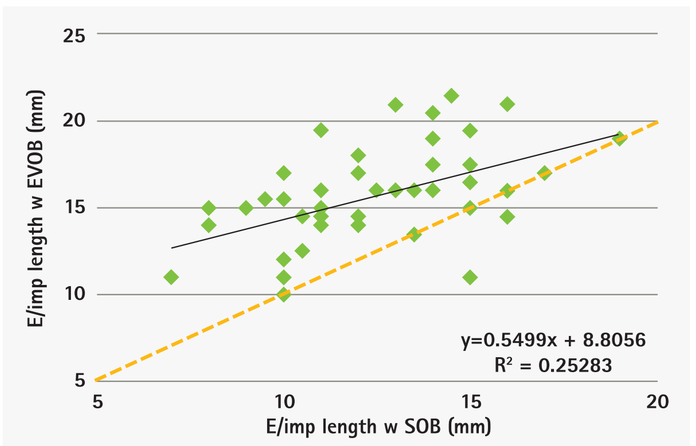

Fig 6. Regression analysis of impression length with EVOB versus SOB. Plot line (black) shows best fit from linear regression (p <.001) and orange dashed line shows unity.

- The benefits provided by the EVOB compared to SOB are not only about additional length; impressions taken with EVOB provide more information about the sound path to the ear drum (Fig 7) and were rated as more comfortable by a number of clinicians having impressions taken.

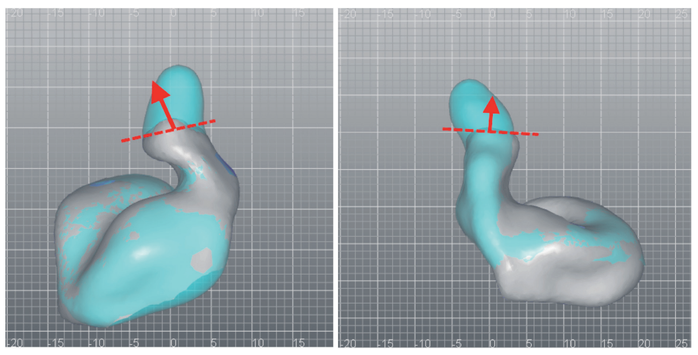

Fig 7: Align and compare of ear impressions taken with a SOB (grey) and EVOB (light blue). These two examples illustrate how the extra information provided by the EVOB will enable more accurate placement of the sound bore following the path towards the ear drum.

Discussion

- Results show a significant average improvement in impression length of 3.2 mm with the EVOB, consistent with the findings of Schwarzlos Sooprayen (2017).
- The average improvement in the current study is less than the average 5.52mm reported by Schwarzlos Sooprayen (2017), which may be due to a combination of factors such as their smaller sample size, different measurement technique (from base of impression, we estimated length from ear canal opening) and a significant outlier in their data (15mm improvement).
- The finding that additional length provided by the EVOB was greater when the impression taken with the SOB was shorter is perhaps due to the increased visibility the EVOB window provides, increasing confidence, or due to the fact that for already deep impressions – there is less room for additional length gains.

Conclusion

Overall the results indicate the EVOB supports clinicians taking deeper impressions that are more comfortable for the client.

REFERENCES: Schwarzlos Sooprayen, J-K (2017) Deeper ear impressions with EasyView Otoblock. Phonak FSN, Phonak AG.
Schwartz, S. (2015) Virto V custom presentation. LIO meeting, Greece

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