



Piloting Ultrasound Evaluation of Swallowing (USES) in the Clinical Population with Neurological Diseases

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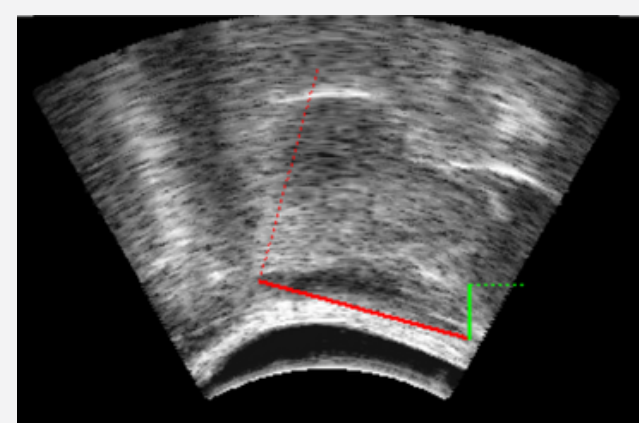
USES



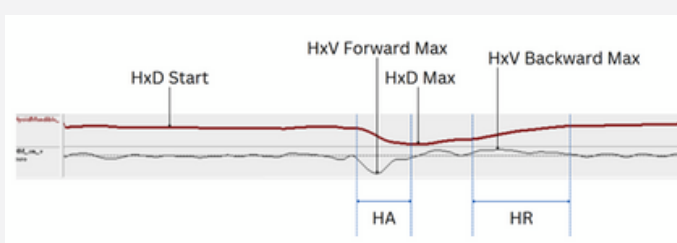
A pocket-size standard B-mode **ultrasound system** is used in USES



Ultrafit headset was used for probe stabilisation



Tracking of key bio-markers (hyoid & mandible)



Extraction of **key measures**:

1. Maximum displacement
2. Forward peak velocity
3. Backward peak velocity
4. Total duration
5. Start-to-max duration
6. At max duration
7. Max-to-end duration
8. Time to forward peak velocity
9. Time to backward peak velocity

BACKGROUND

- USES is an emerging tool for swallowing assessment
- Clinical translation could add another tool to SLTs' swallowing assessment
- Aims:
 - Feasibility and requirement for data acquisition in people with neurological diseases in NHS clinics
 - Explore links of hyoid movement on ultrasound to VFSS findings
 - Evaluate users' experience

METHODS

- 13 participants with neurological diseases took part in USES:
 - Age: 28-63 (means 42.2)
 - Dx: Myotonic Dystrophy (I) & Ataxia Telangiectasia
- Ultrasound probe: 60mm convex probe
- Recording of
 - 2 x saliva swallow
 - 3-5 x 5ml water bolus



RESULTS

Feasibility & requirements

- Data acquisition rate: 85%
- Hyoid movement was successfully tracked on 79% of the data collected
- Patients were able to wear the headset in the clinical setting

USES results compared with VFSS

- MBSImP rating of component 9 (anterior hyoid excursion) - all participants had a rating of 1 (partial excursion) except one (2; no anterior movement)
- On USES, the participant with component 9 rated as 2 showed reduced forward peak velocity but a similar range of displacement

Users' experience (10 participants completed the questionnaire)

- 20% increase in rating USES as 'somewhat uncomfortable' and 'somewhat more uncomfortable to swallow'
- USES rated higher than VFSS in terms of the taste of the drink
- Similar rating for VFSS & USES in terms of ease of understanding image

DISCUSSION

- USES is feasible in the clinical setting an population
 - Further consideration to recording protocol and clinician training to improve the ease of use and reliability of data acquisition
- User experience showed a similar rating to VFSS
- Automatic tracking has potential to provide more detailed information about hyoid movement in swallow (e.g., amplitude, velocity and duration) to support understanding of dysphagia

