DYSPHAGIA AND DYSPHONIA FOLLOWING TOTAL LARYNGECTOMY SURGERY

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“We like to bring together people from radically different fields and wait for the friction to produce heat, light and magic. Sometimes it takes a while.”
Review and Aims

- Commenced late 2005
- Our research group has grown
  - Dedicated post-doc research fellow
  - New PhD student dedicated to laryngectomy research
- Our research aims:
  - Swallowing – assessment and treatment
  - Tracheosophageal voice function
  - Relationship between swallowing and voice
PhD Findings – swallowing dysfunction

- Recognising 72% of laryngectomees - difficulty swallowing
- Symptoms include
  - food sticking in throat every day (92%)
  - taking a longer time to swallow (89%)
  - build up of food in throat (77%)
  - tightness in throat every day (68%)
- Most laryngectomees
  - cannot swallow a tablespoon (92%)
  - > 1 swallow to clear bread (70%)
- A significant number
  - cannot swallow bread at all (25%)
Where swallowing dysfunction present
- distress (extreme – 40%)
- negative impact on survivorship
  - 57% no longer eating out socially
PhD Findings – Implications for surgeons/clinicians

- Great variation in surgical closure techniques
  - Got the ENT’s talking!
- No evidence as to ‘best’ closure technique
- Swallowing difficulties appear immediately post-op
- 50% had anatomical derangements in pharynx
- 100% had ‘altered swallowing’ – 50% unaware!
- Swallowing dysfunction in laryngectomy until now
  - under-reported by patients
  - under-recognized by clinicians
Progress in last 12 mths?

- Pilot study on swallowing treatment
  - World first - treatment is safe and effective
  - Awaiting publication

- NHMRC HNC cancer/swallowing grant
  - Relevant to laryngectomy population
  - $400,000 over 3 years

- Full ethics approval for 3 new laryngectomy studies
- Purchasing of equipment
  - Endoflip - $20,000 and $500 per catheter

- Recruitment on 3 laryngectomy studies
Normal Swallow - Throat
Normal Swallow - Throat

Propulsion

Relaxation
Normal Swallow – Food pipe
Peristalsis
Relaxation
Pilot study: Dilatation for post-laryngectomy dysphagia

Findings:
- Response rate 67%
- Safe, day procedure
- No complications
- Average 3 dilatations
  - (max 9)
Randomized Controlled Trials

Dilatation to improve swallowing function

1. Post Laryngectomy
2. Head and neck radiotherapy

• Disciplined - highest level of evidence

• Long term durability?

• Predictors of success

  - Pressure recording, x-ray images, EndoFLIP
Endoflip: Measuring sphincter stiffness directly
Key Points

- Dilatation – promising
- Solid proof needed → randomised trial
- State of the art technology
- Obtained funding and approvals
  - 4 patients enrolled → need 44

HELP
Insights into the Biomechanics of the Pharyngoesophageal Segment during Tracheoesophageal Speech in Patients Following Total Laryngectomy

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Tracheoesophageal Voice
Current Knowledge – Disagree

Pressure
It’s a Fan!

It’s a Wall!

It’s a Rope!

It’s a Spear!

It’s a Snake!

It’s a Tree!
Hypotheses

- P2 Too Stiff (Low Compliance)
- P1 Too Low
Aims

• Examine the pressure gradient across the vibration segment, during phonation

• Examine the compliance of the vibration segment: compliance = 1/stiffness
Aims

• The fundamental question is to examine how these measurements impact on the quality and intelligibility of Tracheoesophageal speech
Methods: Fluoroscopy with HRM
Methods - EndoFLIP
Methods: Visi-pitch

Key Points

- For the first time the pressure gradient across the vibration segment is studied in laryngectomees

- For the first time the tissue property of the vibration segment is studied in laryngectomee

- For the first time two most cutting edge technology are used in studying what impacts on the quality and intelligibility of the speech in laryngectomees
Thank you

Grace Teng Zhang
Why the Questions Still Exist

- **Difficulties of recruiting patients**
  - Small sample size in past studies or case report

- **Diversities in the patients population**
  - Different treatment procedure; pre-existing conditions

- **Technology restrictions**
  - Cost of solid state HRM
Preliminary results