VIDEOMANOMETRIC EVALUATION OF DYSPHAGIA FOLLOWING TOTAL LARYNGECTOMY

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BACKGROUND

- Following total laryngectomy surgery:
  - prevalence of dysphagia is high (72%)
  - 42% of patients require a modified diet 3 years post surgery

- Various reconstructive techniques are used

- Effect of specific pharyngeal reconstruction techniques on swallowing outcomes is unknown
AIMS

• Assess pharyngeal pressures and swallowing efficiency following total laryngectomy surgery.

• Examine the association between swallowing efficiency and pharyngeal pressures and the type of surgical closure of the pharynx.
METHODS

• **Patients**
  Total laryngectomy for squamous cell carcinoma.

• **Exclusion criteria**
  - neurological disorder,
  - previous dysphagia,
  - previous surgical treatment for H&N cancer.
METHODS

Pharyngeal videomanometry

Triplicate swallows
- 3, 5, 10 and 20ml of liquid barium
- 5ml fruit puree mixed with barium
- 2 x 2 cm bread slices soaked in barium
METHODS

• Measurements
  - Presence/absence of diverticula
  - Pharyngeal residue post swallow
    (nil, <25%, 25-50%, 50-75%, >75%)
METHODS

PHARYNGEAL MANOMETRY

peak base of tongue

peak hypopharyngeal

hypopharyngeal intrabolus
METHODS

PHARYNGEAL DIMENSIONS
RESULTS

DEMOGRAPHICS

- \( n = 24 \) 46 to 82 y.o. (19 males)
- 12 had self-reported dysphagia
- Adjuvant treatment
  - 18 radiotherapy, 3 chemoradiation
- Time after surgery
  - < 5yrs \( n = 15 \)
RESULTS

SURGICAL VARIABLES

• Level of pharyngeal closure
  mucosa alone: n = 4
  mucosa and muscle: n = 20

• Direction closure
  Transverse, T or Y closure: n = 12
  Vertical closure: n = 8
  Unknown: n = 3

• Myotomy n = 14 (2 unknown)
RESULTS

Pharyngeal residue post-swallow

Percentage of patients

% residue
- Nil
- <25
- 25-50
- 50-75
- 75-100

3ml liquid 5ml liquid 10ml liquid Puree Bread
RESULTS

Peak hypopharyngeal pressure

Intrabolus pressure

- Laryngectomy patients
- Aged controls

**mmHg**

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<th>3ml liquid</th>
<th>5ml liquid</th>
<th>10ml liquid</th>
<th>Puree</th>
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* * p < 0.05

Laboratory normal ranges

* mmHg

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*Laboratory normal ranges*
RESULTS

**Peak hypopharyngeal pressure**

- Mucosa alone closure
- Mucosa and muscle closure

**Intrabolus pressure**

* p < 0.05
RESULTS

Peak hypopharyngeal pressure

- Vertical closure

Intrabolus pressure

- Transverse or combined closure

mmHg

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**RESULTS**

**Pharyngeal dimensions**

**Sagittal Projection**

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<th>Diameter (mm)</th>
<th>Narrowest width</th>
<th>Mean width</th>
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- **Type of closure**
  - Mucosa alone (n=4)
  - Mucosa and muscle (n=20)

- Normal maximal UOS Ø *

*Cook, Dodds et al. AJP 1989*
RESULTS

Anatomical deformations

Anterior pharyngeal diverticula and/or pseudoepiglottis
- mucosa closure 4/4 (100%)
- mucosa and muscle closure 9 of 19 (47%)
Summary and conclusions

Following a total laryngectomy surgery:

- Swallowing function is compromised.
  - with diminished pharyngeal diameter
  - increased intrabolus pressures
  - pharyngeal residue post-swallow.

- Swallowing efficiency appears to be related to the techniques used in the pharyngeal reconstruction
  - tentative evidence that mucosal and muscle closure is superior
    - ↑ peak pharyngeal pressure
    - ↓ diverticula
Acknowledgements