Surf, Sea and Supracricoid Laryngectomy: A Queensland Experience

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PARK BY LAWS WILL BE ENFORCED WHICH CARRY A MAXIMUM FINE OF £500.
Queensland...

- 2500 times the size of Singapore
- Same population as Singapore!
- Half the number of ENT surgeons
- Over two thirds of ENT surgeons in Brisbane and Gold Coast
- Fastest growing state in Australia
- Home of Kevin Rudd!
Head and Neck Service at Princess Alexandra Hospital

- Second largest hospital in Queensland
- 727 beds
- Head and Neck unit sees 840 new cancer cases per year
- 5 visiting medical officers and 1 staff specialist
Head and Neck Cancer in Queensland

- High rate of smoking and alcohol consumption
- Sun related skin cancers extremely common
- Half all parotidectomies done for malignant disease (SCC with lymph node)
- Trigeminal nerve perineural spread of skin SCC common
Supracricoid laryngectomy (SCL + CHP / CHEP)

- First described by Majer & Rieder in 1959
- Rediscovered and modified by the French in 1974
- Not widely reported in English literature until 1990s
- Preservation of the hyoid bone, cricoid cartilage and one cricoarytenoid unit
- Reconstruction – CHP or CHEP
SCL

Indications

• T2 lesions of the glottis or supraglottis (epiglottis)
• T3 lesions with vocal cord fixation, pre-epiglottic space invasion or minimal thyroid cartilage invasion
• (Patient motivation!)

Contraindications

• Arytenoid fixation
• Infraglottic extension (10 mm anteriorly, 5 mm posteriorly)
• Significant pre-epiglottic space involvement
• Cricoid cartilage invasion
• Invasion outer perichondrium of thyroid cartilage
• Extralaryngeal extension
• Poor pulmonary function
• Severe reflux disease
Surgical steps
Exposure

- Thyroidectomy incision extended as necessary for neck dissection
- Subplatysmal flaps elevated 1 cm beyond hyoid to sternal notch
- Sternohyoid divided superiorly and preserved
- Deep straps transected along upper and lower borders of the thyroid cartilage
Strap division
Exposure

- Laryngeal vessels are ligated preserving the superior laryngeal nerve
- Inferior pharyngeal constrictors and external thyroid cartilage perichondrium and transected, allowing the pyriform sinuses to be released as per laryngectomy
- Isthmus of the thyroid gland is divided and transfixed
- Trachea is freed to the carina by blunt dissection along the anterior wall
- Both recurrent laryngeal nerves are identified and preserved
- Cricothyroid joints are disarticulated
Exposure
Resection

- Hyoid periosteum incised anteriorly and laterally
- Pre-epiglottic space dissected from posterior surface of hyoid
- Larynx entered superiorly through a *transvallecular* horizontal pharyngotomy, and inferiorly through *cricothyroidotomy* just above border of cricoid
- ETT removed then inserted via cricothyroidotomy
- Surgeon moves to head of bed for better visualisation
- Vertical pre-arytenoid incision is made with the scissor down to the cricothyroidotomy on the non-tumour bearing side
Resection
Resection

- Thyroid cartilage is then grasped and fractured along the midline, as if opening a book
- Excision of the tumour then proceeds under direct visualisation
- Excision of one arytenoid is possible
Resection
Reconstruction

• Nasogastric tube is best placed at this juncture
• Mucosa of the upper arytenoid is sutured close primarily with 4/0 vicryl
• Arytenoids are drawn forward and sutured to the posterolateral aspect of the cricoid with 2/0 vicryl sutures
• The cricothyroidopexy or cricohyoepiglottopexy is performed using three submucosal ‘0’ prolene sutures around the hyoid and cricoid. The sutures should catch the root of the suprathyroid epiglottis if this structure has been preserved
• Tracheostomy is performed, allowing removal of the ETT
• ‘Pexy’ sutures are tied whilst tension is applied by neighbouring sutures
Reconstruction
Post-operative care

• Post-operative antibiotics for 7 days
• Long term anti-reflux medication
• Daily physiotherapy
• Decannulation is attempted when cuff deflation is tolerated and patients can cough
• Patients are taught supraglottic swallow by speech therapists
• PEG tube is considered in patients who are likely to need prolonged rehabilitation
Patient details

n = 19
Consecutive cases between 1997 – 2008
Performed by 4 surgeons

Age at diagnosis = 52.6 years
15 Male : 4 Female
6 treated for recurrent disease (2 post RT, 2 post laser, 2 post RT & laser)
13 treated primarily
## Tumour characteristics

<table>
<thead>
<tr>
<th>Primary site:</th>
<th>Stage preoperatively</th>
<th>Nodal status</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 glottic</td>
<td>rT1b</td>
<td>N0</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>N1</td>
</tr>
<tr>
<td></td>
<td>rT2</td>
<td>N2a</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>N2c</td>
</tr>
<tr>
<td>5 supraglottic</td>
<td>rT1b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rT2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rT3</td>
<td></td>
</tr>
</tbody>
</table>
# Operative details

<table>
<thead>
<tr>
<th>Procedure/Detail</th>
<th>Count</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>13/19 had SCL-CHP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6/19 had SCL-CHEP</td>
<td></td>
<td>15/19 CLEAR</td>
</tr>
<tr>
<td>7/19 had one arytenoid resected</td>
<td></td>
<td>3/19 Positive</td>
</tr>
<tr>
<td>9/19 had simultaneous bilateral neck dissections</td>
<td></td>
<td>1/19 Close</td>
</tr>
<tr>
<td>5/19 had unilateral neck dissections</td>
<td></td>
<td>1/19 Perineural Invasion</td>
</tr>
</tbody>
</table>
<pre><code>                                                             |       | 2/19 Lymphovascular invasion |
</code></pre>
<p>| Median depth: 5.5 mm                                   |       |                 |</p>
Outcomes

Median length of stay = 18 days
Median days to decannulation = 8.5 days
Median days to complete enteral feeding = 165 days
4/19 patients received adjuvant RT
Complications:
3/19 wound infections, 2/19 chest infections, 1 significant aspiration, 1 post-op haematoma

2 patients had local recurrence; 1 significant aspiration had salvage surgery:
2 had total laryngectomy
1 required pharyngolaryngectomy

Median FU: 15 months
17/19 Alive free of disease
1/19 Dead from disease
1/19 Dead from other causes
Trends from PA case series

- Salvage SCL and resection of one arytenoid associated with more complications and delayed PEG removal, but not longer decannulation
- No difference in overall survival in group treated primarily and group treated for salvage
- Salvage SCL following RT (4/19)
  - All alive and free of disease at 84 months
  - But 2/4 required completion laryngectomy
- Positive margins predicts local recurrence
Staff

You HERO blo wash eh han ahh!!

Please Nor Feget for Washe Han Blo Upla Prapa Ebry Time

*Bepor u touch eh patient*
*Bepor meke Aseptic tasks*
*Aptar touch eh patients body fluids*
  eg. Touch e open sores or blood
*Aptar touch eh all sumthing blo patient*

No Feget!!

Patients blo upla and all you work mate e counting on you!
# Case series of previously untreated cases of early stage disease

<table>
<thead>
<tr>
<th>Series</th>
<th>n</th>
<th>Decannulation (days)</th>
<th>Enteral feeding (days)</th>
<th>Median FU (months)</th>
<th>Disease-specific survival</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laccourreye, Laennec Hospital, Paris, 1990</td>
<td>68</td>
<td>7</td>
<td>15 (Only in 74.6%)</td>
<td>36</td>
<td>71.4%</td>
<td>Neo-adj 3 cycles of Cis/5FU chemo, 17/68 Adj RT to neck</td>
</tr>
<tr>
<td>La Sapienza University – Rome, 2005</td>
<td>253</td>
<td>25 in 97.2% (CHEP); 30 in 90% (CHP)</td>
<td>15 (CHEP); 28 (CHP)</td>
<td>51</td>
<td>79.1%</td>
<td>Adj RT in 10; Uni &amp; Multivariate analysis</td>
</tr>
</tbody>
</table>

## Treatment Outcomes

<table>
<thead>
<tr>
<th>RT for T1 T2 glottis Mendenhall WM (2001)</th>
<th>T1a</th>
<th>T1b</th>
<th>T2a</th>
<th>T2b</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 year disease specific survival</td>
<td>98%</td>
<td>98%</td>
<td>95%</td>
<td>90%</td>
</tr>
<tr>
<td>5 year local control with laryngeal preservation</td>
<td>95%</td>
<td>95%</td>
<td>82%</td>
<td>76%</td>
</tr>
</tbody>
</table>
Case series of previously untreated advanced disease (T3 / T4)

<table>
<thead>
<tr>
<th>Series</th>
<th>n</th>
<th>Length of stay</th>
<th>Decannulation (days)</th>
<th>Enteral feeding (days)</th>
<th>Median FU (months)</th>
<th>Disease-specific survival</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laccourreye, Laennec Hospital, Paris, 1998</td>
<td>60</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>60</td>
<td>72.7% (Local control 91.7%)</td>
<td>Neo-adj 3 cycles of Cis/5FU chemo, 17/60 Adj RT</td>
</tr>
<tr>
<td>Brazilian National Cancer Inst, 2005</td>
<td>43</td>
<td>5.7</td>
<td>29.6</td>
<td>33.8</td>
<td>60</td>
<td>78% (Local control 94.7%)</td>
<td>14/43 had adjuvant RT; 10 cases excluded due to poor FU</td>
</tr>
</tbody>
</table>

RTOG 91-11. Headline figure of 88% larynx preservation at 2 years and reduction of laryngectomy by 43%

But, 23% poor swallow, 3% can’t swallow and 36% 5 year disease-free survival in the concurrent chemoradiotherapy group
## Comparable case series

<table>
<thead>
<tr>
<th>Series</th>
<th>n</th>
<th>Primary: Salvage</th>
<th>Stay (days)</th>
<th>Decannulation (days)</th>
<th>Enteral feeding (days)</th>
<th>Median FU (months)</th>
<th>Disease-specific survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johns Hopkins, 2007</td>
<td>24</td>
<td>14:10</td>
<td>6</td>
<td>37</td>
<td>70</td>
<td>36</td>
<td>100%</td>
</tr>
<tr>
<td>Lausanne, Switzerland, 2000</td>
<td>69</td>
<td>54:15</td>
<td>35</td>
<td>27</td>
<td>25</td>
<td>53</td>
<td>80.1%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>19</td>
<td>13:6</td>
<td>18</td>
<td>8.5</td>
<td>165</td>
<td>15</td>
<td>94%</td>
</tr>
</tbody>
</table>
SCL after radiation failure?

Supracricoid Partial Laryngectomies after radiation failure: A multi-institutional series


Multicentred Italian retrospective study
78 men, mean age 59.6 years
Stage I and II disease initially
64 – 66 Gy RT. No chemo
Median disease-free interval between RT and salvage surgery = 16 months

62 SCL-CHEP
16 SCL-CHP
41/78 had one arytenoid resected
21/78 had simultaneous neck dissections – 15 unilateral, 6 bilateral

Disease-free survival = 95.5% at 3 and 5 years
Overall survival = 85.2% at 3 years; 81.8% at 5 years
All but 2 decannulated, all but 2 returned to enteral feeding
Conclusions

• SCL is an oncologically sound operation
• It has a role in selected untreated cases and in the salvage setting
• It is an option that should always be considered when contemplating total laryngectomy
• It may enhance quality of life without jeopardising survival rates. Further research in this area is necessary
• Unlike laser microsurgery, it requires minimal equipment and is easier to master