Awake Photoangiolytic Laser Therapy in the Difficult to Expose Laryngology Patient

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Objective

- To identify the pros and cons of awake photoangiolytic laser therapy in the difficult or impossible to expose laryngology patient
**Photoangiolytic fiber-based lasers**

- Relatively safe lasers:
  - Absorption spectrum closely matches Hgb
    - Pulsed Dye Laser
    - Pulsed KTP Laser
  - Generally low energy lasers
  - Limited collateral damage
    - But you sure can if you try!
- Other flexible fiber based lasers available
  - Careful with settings RE: collateral damage

**Photoangiolytic fiber**

**The problem**

- We all are faced with difficult DMLs
- No reliable preoperative predictor for difficult laryngoscopy
  - Clinical indices have low PPV
    - Mallampati, thyromental distance
  - Difficult microlaryngoscopy incidence
    - ~5%

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**Solutions**

*Principle: PATIENT management first; LESION management second*

- Observation usually an option
  - Benign laryngeal lesions ➔ watch
  - Leukoplakia ➔ clinic biopsy, watch
  - Reinke’s edema ➔ watch
  - RRP ➔ can watch for a bit, learn natural history

**Solutions: not just the awake laser!**

1. Imperfect direct laryngoscopy
   - Angled telescope guided surgery
     - RRP ➔ pretty good option; microdebrider
     - Benign lesions, leukoplakia ➔ not advised, risk of bad outcomes
   - Limited control of instrumentation
   - One handed

2. Awake transoral surgery
   - Patient tolerance poor
   - Surgery VERY difficult

3. Flexible fiberoptic **grab-and-pull**
   - Last resort

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*References*

Single Institution Experience: Jan 2007 – present with pulsed KTP
- ~160 direct suspension microlaryngoscopies
- 8 patients treated using awake laser therapy due to difficult microlaryngoscopy
- 7 (3.3%) referred with difficult DML and confirmed in OR
- 1 referred and confirmatory DML not attempted
- Excluded those referred where DML successful

Results

<table>
<thead>
<tr>
<th>Patient</th>
<th>Diagnosis</th>
<th>Number of Procedures</th>
<th>Time interval</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hemorrhagic polyp</td>
<td>1</td>
<td>N/A</td>
<td>Complete TX, no recurrence</td>
</tr>
<tr>
<td>2</td>
<td>RRP</td>
<td>1</td>
<td>N/A</td>
<td>Completely TX, expect recurrence</td>
</tr>
<tr>
<td>3</td>
<td>RRP</td>
<td>3</td>
<td>q3mo</td>
<td>Partial TX, simply abating disease</td>
</tr>
<tr>
<td>4</td>
<td>RRP</td>
<td>5</td>
<td>q3-4mo</td>
<td>Partial TX, simply abating disease</td>
</tr>
<tr>
<td>5</td>
<td>RRP</td>
<td>6</td>
<td>q3mo</td>
<td>Partial TX, simply abating disease</td>
</tr>
<tr>
<td>6</td>
<td>Leukoplakia</td>
<td>2</td>
<td>q1mo</td>
<td>Limited Response, Observation</td>
</tr>
<tr>
<td>7</td>
<td>Reinke's edema</td>
<td>1</td>
<td>N/A</td>
<td>Partial TX, pt. happy</td>
</tr>
<tr>
<td>8</td>
<td>Chondro- radionecrosis</td>
<td>2</td>
<td>q1mo</td>
<td>Partial, treatment ongoing</td>
</tr>
</tbody>
</table>

Hemorrhagic Polyp

RRP
Reinke’s Edema

Advantages
- Airway safety!
- Time efficiency
  - Eliminate challenging/failed DMLs
  - Frustrating for patient and surgeon
- Practical tool
  - Fairly hard to cause peripheral damage
  - Not limited by bleeding
  - Generally successful at managing disease

Limitations
1. **Patient tolerance**
   - Difficulties with anesthesia
     - Anesthesia tips:
       - Dry mucosa prior to topical
       - Difficult to ‘dip on’ patients →
         - tracheal instillation
         - SLN blocks
         - Lidocaine nebs
   - Limited anesthesia time

2. **Surgeon tolerance**
   - Moving target
   - 2D view
   - Limited degree of scope movement
   - Laser limitations:
     - your laser ain’t all that “smart”!

Take Home Points
1. Awake fiber-based laser therapy is effective in managing difficult to expose laryngeal patients
2. Counsel patients effectively
   - Give options for treatment
   - Prepare patients for multiple surgeries
   - Set realistic expectations
   - Prepare patients for failure
3. Don’t be heroic; multiple procedures instead
   - Recognize loss of precision in the awake patient
   - The laser isn’t smart enough
   - Avoid burning normal tissue