Salivary Endoscopy: Applications and New Developments
6th June 2014
Head & Neck Symposium
Huntington Beach, Orange County, CA

Rohan R. Walvekar, MD
Associate Professor
Mervin L. Trail Endowed Chair in Head & Neck Oncology
Department of Otolaryngology & Head Neck Surgery
LSU Health Sciences Center, New Orleans, LA
Touro Infirmary, New Orleans, LA
Our Lady of the Lake Regional Medical Center, Baton Rouge, LA

Director, Salivary Endoscopy Program
Director, Clinical Research Program
Director, Head Neck -Public Hospital System

Disclosure
I have the following relationship(s) with commercial interests.

Hood Laboratories
*salivary stent

Cook Industries

Potential conflict of interests have been mitigated by the planning committee in accordance with policies of the SC PMG Regional CME Department.

A commercial interest is any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.

Basic Salivary Endoscopy

Advanced Techniques/Newer Developments
Sialendoscopy aims to visualize the ductal system and perform interventions to treat intra-ductal pathology
- Aimed at the management of non-neoplastic diseases of the salivary gland
- In conjunction with external approaches, the goal is “gland preservation”

Gland Preservation: using sialendoscopy as either a replacement or an adjunct to external approaches.

History
- Arzoz and colleagues used 2.1 mm urethroscope with a 1 mm working channel and used LASER
- 1994 Nahlieli used a rigid mini endoscope to treat salivary disorders
- 1997 Marchal described his experience and introduced a satisfactory set with Karl Storz
- In 2004, Zenk and colleagues reported their initial experiences with using a new highly flexible, semi rigid endoscope with high-quality imaging (6,000 pixels, ext dia of 1.1 mm, working channel of 0.4 mm)

Sialoendoscopic Observations
- 1975, Mason and Chisholm described strands of smooth muscle around the Wharton’s duct wall
- 1991, Katz reported the same observation
- Nahlieli and Baruchin described the same phenomena in the Stensen’s duct
- Sublingual duct opening
  - During submandibular sialendoscopy the sublingual duct opening (known as Bartholin’s duct) has been observed in the anterior part of the Wharton’s duct, up to 5 mm posterior to the papilla
It is important to remember that the Stensen’s duct curves around the anterior border of the masseter before it opens into the oral cavity. An 'acute masseteric bend' can make endoscopy difficult or impossible.

Relevant Anatomy

Submandibular Ductal System
Thomas Wharton (1659)
Ductal opening is the narrowest part of the ductal system and the rate-limiting step for salivary endoscopy.

- Diameter of the submandibular duct is 4mm and parotid duct is 3mm.

It’s important to know the course of the Wharton’s duct and its relationship to the lingual nerve.
Anatomical Considerations

- The Wharton’s duct has a diameter of about 4 mm
  - It is possible to explore up through several generations of branching
    - Marchal says occasionally 4th

- Stensen’s duct has a diameter of about 3 mm
  - It is possible to get pack to the lobule of the ear in some cases

   *Wharton’s duct difficult to enter, easier to navigate / Stensen’s duct easy to enter, difficult to navigate*

INDICATIONS

- Mechanical Indications
  - Salivary stones
  - Ductal stenosis

- Pharmacological indications
  - Recurrent salivary gland swellings not responding to conservative therapy
  - Sialadenitis: bacterial or viral
  - Radio-iodine (RAI) induced sialadenitis
  - Autoimmune disorders: Sjögren’s syndrome
  - Recurrent parotitis of childhood

Epidemiology

- 1 in 15 to 1-30,000 incidence of stones
  - Escudier and McGurk (UK)

- Autopsy studies of sialolithiasis show presence in about 1% but location and symptoms not addressed
Parotidectomy for Inflammatory Disease

- Need to do a total (Johnson JT et al)
- Significant facial nerve risk ~ 25%
Marginal weakness: Incidence after surgery

133 patients excision submandibular gland
- Excluded 12 patients with malignancy
- 29.8% weakness
- All resolved


Complication of SMG Excision

- 86 patients
- Neuropraxia frequent
  - resolved in 92%
  - 3.4% incidence of multiple nerves involved [F>H>L]
- Also noted
  - Scar problems
  - Reduced salivation
  - Change in taste perception
  - 18% residual stones Wharton’s duct

- Hald and Andreassen (1994) ORL J Oto Relat Spec
Radiology for Salivary Gland Inflammatory Disease

Plain Films

CT Scans (with and without?)
- Plain films
  - 20-70% radio-opaque
- CT
  - All stones visible on CT
  - 2mm or less may be missed
  - Dental issues
- CONTRAST???
  - PATIENTS WITH STONES CAN HAVE TUMORS!
Sialography

- Sialogram
  - Invasive
  - Dye allergy
  - Radiologist dependent
  - Contra-indicated in acute disease

CT Sialogram

- Still invasive with same limitations
- Allows for 3 dimensional scans
- Still radiologist dependent
Ultrasound

- Ultrasound investigation of the major salivary glands has been routinely used for the past 25 years
- Ultrasound provides an immediate diagnosis in acute or chronic inflammatory salivary diseases
- Only small portion of the parotid is hidden because of shadow of mandible
  - Can use transducer trans-oral
  - Can visualize sialolithiasis as small as 2 mm

Ultrasonography

Figure 5. Ultrasound demonstrating sialolithiasis with dilatation of Wharton’s duct (small white arrows) secondary to a meatal stone (not shown, see text). There is a non-obstructing intraductal calculus within Wharton’s duct casting an acoustic shadow (large white arrow), together with sludge. S, submandibular gland
MRI Sialography
- Non-invasive
- 3mm T2 weighted fast spin-echo images in sagittal and axial plane
- Volumetric reconstruction then uses characteristics of saliva in ducts to create an image
  - Saliva is the contrast agent

Sagittal MRI
- Stone in hilum with projection into duct

Su et al, Laryngoscope 2006
Basic Instrumentation & Set Up

- Instruments for Exposure of the Oral Cavity
  - Anesthesia - Nasal Intubation Disposable Plastic cheek retractor
  - Dental splints
  - Mouth gag
  - Minnesota and Sweetheart retractors

Basic Sialendoscopy Set

- Exposure
  - Assistants/retract (combined approach techniques)
  - Mouth props or retractors
- Loops
- Microscope
- Robot?
Dilator System
Dilation Techniques: (courtesy Dr. Schaitkin)

Introducer Set

Sialendoscopy
Access Sheaths: Pearls

- Designed to be used as a dilator for the submandibular system papilla; are not approved for the parotid
- Can be used to dilation of stenosis; most submandibular and some parotid as well
- Must always be used over guide wire and must not be passed beyond the guide wire – perforation risk
- Indwelling sheath can be useful and also harmful; titrate its use to your needs.

Dilator System

- Marchal Dilator System
  - Probes No.0000 to No.8
- Schaitkin’s Fluted Dilators (not yet on the market)
  - No.0 – 5
- Conical Dilator
  - Helps to transition between dilators
  - Useful usually once papilla is dilated up to Marchal No.1 or 2 dilator
- Bougies (increasing diameter)
  - Compatible with 0.4 mm guide wire
Basic Sialendoscopy Set
- IV Extension Tubing
- 20 cc syringe
- Vessel loops
- Angled Forces with and without teeth
- Standard Endoscopy Tower and Monitor with recording capabilities**
Accessories
- Disposables
  - Wire baskets
  - Guide wires
  - Stent
    - Salivary Stent (1 mm and 0.6 mm)
    - Salivary Canula (1.5 and 2.0 mm)
  - Balloon Dilator/Laser fibers
- Not Disposable
  - Hand-held micro burr/Stone forceps

Sialendoscopes
- 1.3 mm Marchal*
- 1.1 mm Erlangen*
- 1.6 mm Erlangen*

*Karl Storz, Tuttlingen, Germany

Marchal Sialendoscope

COOK WIRE BASKETS

N CIRCLE

N GAGE
Diagnostic Sialendoscopy
- **100% Successful endoscopy**
- Ductal or papillary stenosis in 7/15 (47%)
- Essentially normal endoscopy in 8/15 (53%)
- Symptoms improved in 13/15 (87%) cases

**Indications for sialendoscopy**
- Sialolithiasis (n = 13, 46%)
- Sialadenitis (n = 11, 39%)
- JRP (n = 3, 11%)
- Sphincter (n = 1, 4%)

Bowen M et al. Diagnostic and Interventional Sialendoscopy: A preliminary experience. 2010 Laryngoscope (accepted for publication)

Sialoscope Cannulation
- **Progressive dilation**
  - Marchal Dilator System (No.0000 to No.6)
  - Conical dilator
- Seldinger technique
  - Guide wire and bougies
- Papillotomy
  - 25% (7/28)

**Successful endoscopy**
- 96% (27/28)

Papillotomy for diagnostic endoscopy...consequences...
STENTS

- Schaitkin Salivary Duct Cannula (Hood Labs, USA)
  - 1.5 and 2.0 mm
- Walvekar Salivary Stent (Hood Labs, USA)
  - 1.2 and 1.0 mm stents with Guide Wire
  - 1.0 and 0.6 mm
- Duration: 2-4 weeks

The Learning Curve

Training Opportunities

- LSU Salivary Endoscopy Workshop
  - New Orleans
  - HANDS ON TRAINING
  - 2-Day Workshop
- Karl Storz: CASE OBSERVATIONS
  - Rohan Walvekar
    - LSU, Baton Rouge LA
  - Boyd Gillespie
    - MUSC, South Carolina
  - Barry Schaitkin
    - University of Pittsburgh, PA
Acknowledgements

- Dan W Nuss MD, Faculty and Residents, Department of Otolaryngology, Head Neck Surgery, LSU HSC, New Orleans, LA
- Barry Schaitkin, MD (University of Pittsburgh)

Thank You: rwalve@lsuhsc.edu

LSU Salivary Endoscopy Course, March 21st-22nd, 2015

Salivary Endoscopy: Applications and New Developments

6th June 2014
Head & Neck Symposium
Huntington Beach, Orange County, CA

Rohan R. Walvekar, MD
Assistant Professor
Mervin L. Trail Endowed Chair in Head & Neck Oncology
Department of Otolaryngology & Head Neck Surgery
LSU Health Sciences Center, New Orleans, LA
Our Lady of the Lake Regional Medical Center, Baton Rouge, LA
Touro Infirmary, New Orleans, LA

Director, Salivary Endoscopy Program
Director, Clinical Research Program
Director, Head Neck -Public Hospital System
Basic Salivary Endoscopy

Advanced Techniques/Newer Developments

Mechanical Indications
- Salivary stones
- Ductal stenosis

Pharmacological indications
- Recurrent salivary gland swellings not responding to conservative therapy
- Sialadenitis: bacterial or viral
- Radio-iodine (RAI) induced sialadenitis
- Autoimmune disorders: Sjögrens syndrome
- Recurrent parotitis of childhood

INDICATIONS

Interventional Sialendoscopy

- Endoscopic removal of stone
- Combined approach technique for large or impacted stones.

Small stones: submandibular < 4mm, parotid < 3mm

Interventional sialendoscopy
- Wire basket
- Laser lithotripsy
- Balloon dilatation

large stones: submandibular > 4mm, parotid > 3mm
Endoscopic Removal of Stone
Small Stones – Complete Endoscopic Removal

- Maximum diameter may not always be relevant; the shape of the stone can affect the ability to perform an endoscopic extraction.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5 mm</td>
<td>Removal failed</td>
</tr>
<tr>
<td>7.2 mm</td>
<td>Removal successful</td>
</tr>
</tbody>
</table>

Difficult to access stone…
So close yet so far......
Laser for larger stones (5-7 mm)

ECSWL
- Supine, 30 min session, outpatient
- 4.42 sessions per patient mean
- Average size 6mm
  - Fragments: 0.7mm
- No sedation
  - During sessions discomfort & cough
  - Proportional to the power
  - Resolved with reducing power
- Petechial hemorrhage
- Localized swelling
- 2 patients had fillings fall out

Results:
50% effective as primary treatment
- Stone free
- Complaint free (with residual)
- Symptoms improved (with residual)
- Failure
Long-term Data (191 patients)
- 35% no stones
- 15% stones with very mild symptoms
- 13% recurrence of pre-treatment symptoms
- 38% submandibular gland removal or trans-oral stone removal

Large Stones or Megaliths: Parotid Gland

Combined approach Technique for Parotid Stone

- Endoscopic Localization with Trans-illumination and External Face Approach into Parotid Region
- Parotid Stone Excision and Remove
- With Caution Prevention

Fig. 11. Combined Approach Technique for Parotid Stones via an External Approach.
When sialendoscopy does not work?
Transoral papilla sparing combined approach technique

- 75 year old woman with 3 m history of right parotid swelling that resolved with conservative therapy (including antibiotics)
- History of passing 2 salivary stones right side

Other relevant history
- Non-Insulin Dependent Diabetes
- History of dry mouth, dry eyes – SSA, SSB negative
- No history of renal stones, Gout
- History of Gall stones +

CT scan (Feb 2014)

- Multiple stones right parotid gland
- Largest 7 mm hilar stones
- Small stones along distal aspect of duct ~ 3 mm
Surgery: 5th March 2014

- Parotid endoscopy with identification of first stone
- Wire basket to trap stone
- Stone lodged with basket at 2 cm from papilla
- Transoral Buccal Incision
- Stenson duct localization in buccal space followed by sialolithotomy and stone removal
- Trans buccal placement of endoscope, Cook access sheath to complete removal of remaining stones with endoscopic removal and Laser ablation.
- Wound irrigation removal of stone fragments
- 1.2 mm stent placement over guide wire past and duct repair with 6-0 prolene
Post op evaluation

- April 2014
  - Stent removed in 2 weeks
  - Papilla intact with salivary flow present via natural papilla
  - No facial nerve paresis, sialocele in cheek
  - Patient symptomatically better
- May 2014
  - Patient continues to be asymptomatic
  - Happy with outcome
  - Plan: observe and intervene if symptomatic
CT scan (April 2014)

- Gland dilation resolved
- 2mm distal stone? Extra-ductal
**Conclusion**

- Trans-buccal-papilla sparing combined approach technique with stent placement approach is feasible for management for parotid stones
- Trans-buccal access overcomes the masseteric bend and provides direct access to the parotid hilum for management of multiple stones
- Disadvantages
  - More invasive
  - Opportunity for facial nerve paresis, sialocele, duct stenosis

**Large submandibular stones**

**Technical considerations during hybrid procedures**

- Mouth Opening
- Large teeth
- Stone location
- Limited Operative Exposure
- “Dynamic field”
- Operative time
  - SMG – 90 minutes (37 -235 minutes)
Robot Assisted Stone Removal for Large Submandibular Stones

TORS Sialolithotomy – LSU Experience (2010 – 2013)
Geoffrey Peters, MD; Jason Trahan, Sc.B.; Michael DiLeo, MD; Rohan R Walvekar, MD*

- 12 cases
- Average age: 53 years, (31-80)
- L:R – 5:3
- Stone location: hilar-intraglandular
- Stone size: 9-20mm (one patient with multiple stones)
- Gland preservation: 11/12
- Recurrence 1 patient – SMG gland excision
- Stent: 7/12 patients
- Lingual Nerve Paresis: Temporary 20%

RESULTS AND COMPLICATIONS

- ENDOSCOPIC APPROACH

- COMBINED APPROACH
Results: Indications (N=56)

- Stalolithiasis: 32 (58%)
- Recurrent Salivary Swelling: 11 (19%)
- Sialadenitis: 11 (19%)
- R1-induced sialadenitis: 2 (3%)
- Miscellaneous: 1 (2%)

Indications: Endoscopic approach: distribution of stone and outcomes

<table>
<thead>
<tr>
<th>Stone Size</th>
<th>SMG</th>
<th>Parotid</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4mm</td>
<td>14/19</td>
<td>9/5</td>
</tr>
<tr>
<td>&lt;3mm</td>
<td>3/3</td>
<td>2/2</td>
</tr>
</tbody>
</table>

- For stone <4mm (SMG): retrieval rate was 67% (14/21)
- For stone <3mm (Parotid): retrieval rate was 100% (3/3)
Results: Size of stones
- Range 2mm to 12mm
- Site of sialoliths
  - Parotid gland: 38%
  - Submandibular gland: 62%
- **Endoscopic approach**

<table>
<thead>
<tr>
<th></th>
<th>Removal successful</th>
<th>Removal failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMG</td>
<td>2 – 9 mm</td>
<td>4 – 12 mm</td>
</tr>
<tr>
<td>Parotid</td>
<td>2 – 7 mm</td>
<td>2* – 7 mm</td>
</tr>
</tbody>
</table>

2*: Inflamed duct

- Maximum diameter may not always be relevant, the shape of the stone can affect ability to perform an intraoral extraction

7x5mm - removal failed
7x2mm - removal successful

Walvekar RR, Carrau RL, Schaitkin B. Sialendoscopy: predictors of successful endoscopic sialolithotomy (in press American Journal of Otolaryngology)

**Overall Complication rate 25%**
- Major 2%
- Minor 23%

<table>
<thead>
<tr>
<th>Major Complications</th>
<th>2% (1/56)</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avulsion of the duct</td>
<td>1</td>
<td>Salvage superficial parotidectomy</td>
</tr>
</tbody>
</table>
### Minor Complications

<table>
<thead>
<tr>
<th>Minor Complications</th>
<th>23% (13/56)</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non retrieval of stone</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>- SMG stone</td>
<td>2</td>
<td>SMG excision via cervical approach</td>
</tr>
<tr>
<td>- Retained small stones</td>
<td>1</td>
<td>Conservative massage of gland</td>
</tr>
<tr>
<td>- Parotid stone</td>
<td>1</td>
<td>Second stage parotidectomy</td>
</tr>
<tr>
<td>Failure of procedure</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>- Acute masseteric bony</td>
<td>2</td>
<td>Conservative management and symptom control</td>
</tr>
<tr>
<td>- Ductal stenosis</td>
<td>4</td>
<td>Conservative management. 1 case required a subsequent external approach with ductal stenting</td>
</tr>
<tr>
<td>Retained stone in SMG</td>
<td>1</td>
<td>None-passed through fistulous tract in the neck</td>
</tr>
<tr>
<td>Minor ductal tear</td>
<td>1</td>
<td>Stone-uneventful recovery</td>
</tr>
<tr>
<td>Superficial mucosal necrosis at injection site</td>
<td>1</td>
<td>None-healed with secondary intention</td>
</tr>
</tbody>
</table>

---

### RESULTS AND COMPLICATIONS

- **ENDOSCOPIC APPROACH**
- **COMBINED APPROACH**

---

**Combined approach technique for management of large salivary stones**

Rohan R. Walvekar, MD; Steven R. Bomeli, MD, Ricardo L. Carrau MD, Barry Schaitkin, MD (unpublished data)

- N=19 patients (20 procedures)

- Mean age: 52 years (range, 15 to 69 years); 13F – 6M

- Procedure time – mean operative times >1 hour in 85%
  - SMG - 90 minutes (range, 37 to 235 minutes)
  - Parotid - 133 minutes (range, 75 to 210 minutes)

- At least one stone dimension (length or width) was larger than 4mm in submandibular cases and 3mm for parotid cases*

**Stone Dimensions**

<table>
<thead>
<tr>
<th>Stone Site</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submandibular</td>
<td>5-23</td>
<td>1-16</td>
</tr>
<tr>
<td>Parotid</td>
<td>5-13</td>
<td>2 - 6</td>
</tr>
</tbody>
</table>

**Site and Location**

<table>
<thead>
<tr>
<th>Location</th>
<th>SMG</th>
<th>Parotid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ductal</td>
<td>4</td>
<td>3</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>Hilar</td>
<td>8</td>
<td>1</td>
<td>9 (45%)</td>
</tr>
<tr>
<td>Intra-glandular</td>
<td>1</td>
<td>2</td>
<td>3 (15%)</td>
</tr>
<tr>
<td>Intra-glandular and Hilar</td>
<td>0</td>
<td>1</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>7</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

N=28 cases
- Success of combined approach technique and symptomatic relief – 20/28 (90%) (18/18) 100%
- Failure – 9 (non retrieval and recurrent symptoms) of which 8 underwent submandibular gland excision
  *Marchal F et al. Laryngoscope 2007*

- Longer follow up is required to substantiate these statistics
- No major complications
- Minor complications 20%
- 2 patients – non retrieval of stone required gland excision
- 1 patient – lingual nerve paresis – resolved spontaneously
- 1 patient – recurrent symptoms – resolved with conservative measure

**Diagnostic and Interventional Sialendoscopy: A Preliminary Experience**


N=28 procedures
Mean age 44 years, range (7 to 75 years)

Indications for sialendoscopy
- Sialolithiasis (n=13, 46%)
- Sialadenitis (n=11, 39%)
- SRP (n=3, 11%)
- Sjogrens (n=1, 4%)
Interventional Sialendoscopy Data for Stones

<table>
<thead>
<tr>
<th>Method of removal</th>
<th>% (N)</th>
<th>Mean size (mm)</th>
<th>Range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic removal</td>
<td>13 (100%)</td>
<td>8.2</td>
<td>4 - 20</td>
</tr>
<tr>
<td>Combined removal</td>
<td>7 (54%)</td>
<td>10.8</td>
<td>4 - 20</td>
</tr>
<tr>
<td>Failure of removal</td>
<td>4 (31%)</td>
<td>6.2</td>
<td>4 - 10</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submandibular</td>
<td>11 (85%)</td>
<td>8.2</td>
<td>4 - 20</td>
</tr>
<tr>
<td>Ductal</td>
<td>5 (38%)</td>
<td>5.8</td>
<td>4 - 9</td>
</tr>
<tr>
<td>Hilar</td>
<td>4 (31%)</td>
<td>7.8</td>
<td>4 - 15</td>
</tr>
<tr>
<td>Hilar-glandular</td>
<td>2 (15%)</td>
<td>15</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Multiple stones</td>
<td>3 (23%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parotid</td>
<td>2 (15%)</td>
<td>8</td>
<td>6 - 10</td>
</tr>
<tr>
<td>Ductal</td>
<td>1 (8%)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Hilar-Glandular</td>
<td>1 (8%)</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Major Complications 4% (1/28) Treatment
- Salivary fistula: Pressure dressing, avoidance of sialogogues
- Non retrieval of stone 4
  - Submandibular gland stone: SMO excision via cervical approach
  - Retained stone (2mm): Observation and conservative management
  - Non retrieved (6mm and 4mm hilar-glandular): Second-stage planned CA procedure
  - Papillary stenosis: Revision dilation and stent placement
  - Minor ductal tear: Conservative management
  - Recurrent symptoms: Conservative management

Minor Complications 25% (7/28) Treatment
- Glandular and/or floor of mouth edema: Can contribute to the need to stage a second procedure
- Either combined approach or glandular excision

Minor Complications 25% (7/28) Treatment
- Glandular and/or floor of mouth edema: Can contribute to the need to stage a second procedure
- Either combined approach or glandular excision

Complications

Juvenile Recurrent Parotitis or Recurrent Parotitis of Childhood

- Second most common salivary gland disease in children
- Recurrent, non obstructive, non suppurative swelling of one or both parotid glands
- Etiology – idiopathic, possible etiologies
  - Congenital malformation of the parotid duct
  - Genetic aberrations
  - Viral or bacterial infections
  - Allergic or autoimmune mediated
- Current treatment
  - Warm compresses, sialogogues, antibiotic therapy
Radioactive iodine (RAI) treatment (\(^{131}I\)) related Sialadenitis - Sialendoscopy

- Thyroid ablation for thyrotoxicosis
  - Graves disease (1,4/1000)
  - Autonomous functioning toxic nodule
  - Toxic multinodular goiter

- Ablation of residual thyroid tissue and for surveillance status post total thyroidectomy for differentiated thyroid cancer.

Symptoms & Signs consequent to RAI treatment (\(^{131}I\))

**Symptoms**
- Recurrent painful or painless swelling of one or more glands
- Dry mouth
- Dental caries
- Difficulty swallowing
- Impaired quality of life

**Signs**
- Tongue blade test
- Reduced quantity of saliva
- Thick and/or turbid saliva
Interventional sialendoscopy for treatment of radioiodine-induced sialadenitis

Steven R. Bomell, MD; Barry Schaitkin, MD, Ricardo L. Carrau MD, Rohan R. Walvekar, M.D

Laryngoscope. 2009 May; 119(5):864-7

-N=12; mean age 46 years (range, 25 to 77 years)

-All referred after single dose of RI, mean 143mCi (range, 101 to 185mCi)

-Time of presentation - 10.4 months (range, 5 to 16 months)

-32 glands were scoped (20 parotid; 12 submandibular)

-Median follow up 6 months (range 0.5 to 33 months)

Mucus plugs and debris were removed with irrigation or using a wire basket

Stenosis were dilated using serial dilation or balloon dilation

-Glands were injected with 40 mgs of triamcinolone acetonide injectable suspension (Kenalog-40) diluted in 5 cc of sterile saline solution was injected via the irrigating channel of the scope

-Complications

  - Major 0%(0/32)
  - Minor 15%(5/32)

-Minor complications

  - Acute masseteric bend – 1
  - Nonretrieval of parotid stone due to stenosis – 1
  - Severe ductal stenosis - 3

-Symptom relief in 75% - no recurrence of symptoms after a single interventional endoscopy

-Two other series reported success in 50 and 100%

-In our opinion, success is attributable to removal of debris, dilation of stenosis, and steroid injection

### Sialendoscopy & Sjogren’s

#### Early Stage
- Findings like any other inflammatory disorder
- Blanched ducts
- Debris

#### Late Stage
- Scarred or stenotic ducts
- Atrophic ducts that are difficult to cannulate
- Thick mucopus
- Strictures

### Ultrasound

- Hypo echoic areas
- Heterogeneity
- Unclear borders
- Inflammatory enlarged intra parotid nodes
- Cystic changes within gland

### Sialography: “sausage links”
Sialendoscopy can provide symptomatic relief and help reduce frequency and intensity of symptoms related to SS.

Botox injections are also helpful in this regard; evidence is lacking in literature to support its use.

SS is still a systemic disease – a coordinated effort with Rheumatology / Ophthalmology is recommended.

TO CONCLUDE,
- SIALENDOSCOPY IS SAFE AND EFFECTIVE
- MINIMALLY INVASIVE
- AVOID EXTERNAL INCISIONS AND COMPLICATIONS OF OPEN SURGERY
- GLAND-SPARING
- DOES NOT BURN BRIDGES TO TRADITIONAL TECHNIQUES
- REPEATABLE

TRULY A PARADIGM SHIFT IN THE MANAGEMENT OF NON NEOPLASTIC SALIVARY GLAND DISEASES.
<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT</td>
<td></td>
</tr>
<tr>
<td>42415</td>
<td>EXCISION LATERAL LOBE, W/DISSECTION AND FACIAL NERVE PRESERVATION (Z)</td>
</tr>
<tr>
<td>42440</td>
<td>EXCISION OF SUBMANDIBULAR (SUBMAXILLARY) GLAND (X)</td>
</tr>
</tbody>
</table>

Thank You rwalve@lsuhsc.edu

LSU Salivary Endoscopy Course, March 21st - 22nd, 2015