Gland Preserving Approach to Salivary Stones

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Disclosures

- Paid consultant & Research Support on sleep apnea devices
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- Paid consultant on head and neck surgical devices (Medtronic)

Sialendoscopy circa 2007

Get Stones….Not Stoned
Introduction:
The Limitations of Surgery

- High-rate of FN paresis (40-50%) and paralysis (5%) after gland resection for inflammatory disorders.
- Glands with chronic sialadenitis are often histologically normal.

Salivary Stones

- Major source of obstructive salivary swelling
- Est. incidence 1 in 10,000-20,000 per year
- Risk factor- smoking; dry mouth (medications)
- Mucous core surrounded by inorganic shell (calcium hydroxylapatite); Mean growth 1mm/year
- Readily diagnosed by US or CT (contrast not needed)
- Stones < 2mm may be missed by either technique

### Treatment strategy

I. Small Stones/Mobile Stones (1-5mm)
   - Interventional Endoscopy

II. Medium sized stones (5-10mm)
   - Endoscopy + combined measures

III. Large Stones (>10mm)
   - Combined approaches

IV. Gland removal
   - Multiple stones (>3) or failures

- Ambulatory Operative Procedure
- General Anesthesia
- Nasal Intubation (SMG)
- Oral Intubation (Parotid)
- OR time 2 hours
Interventional Sialendoscopy for treatment

0.38-0.6 mm

0.7 mm

0.78 mm

0.38-0.78 mm

Small Stones
Case 1
Small (≤ 5 mm) Mobile Salivary Stones (Parotid or SMG)

- 23 year old male presents with intermittent left parotid gland swelling.
- CT scan suggests a small 3mm stone at the hilum of the parotid.
- Patient continues to have symptoms after several weeks of hydration, massage, and sialogogues.

Small (≤ 5 mm) Mobile Salivary Stones (Parotid or SMG)

3 mm stone at hilum of left parotid

1st line- Endoscopic Basket Retrieval

Changing What’s Possible

Changing What’s Possible
Case 2
Small (≤ 5 mm) Fixed Salivary Stones (Parotid or SMG)
- 46 year old woman presents with intermittent left parotid gland swelling.
- CT scan suggests a 5 mm stone at the hilum of the left parotid.
- Patient continues to have symptoms after several weeks of hydration, massage, and sialogogues.

Endoscopic Approach with Stone Shattering

5 mm stone at hilum of left parotid

Intermediate Stones
Case 3
Intermediate (5-10 mm) or Fixed Salivary Stones
- 55 year old woman presents with intermittent right SMG swelling.
- CT scan suggests a 8 mm stone at proximal right Wharton’s duct.
- Patient has had several cases of acute sialadenitis in last 3 months requiring 2 course of antibiotics.
8 mm stone in proximal Wharton’s duct

1st Line - Endoscopic Shattering versus Combined Approach (Endoscopic-Open)

Technique
- **Step 1** - Insert scope to confirm stone is not amendable to endoscopic shattering (hard, fixed, too large); Irrigation of infection and debris; Dilation of duct (assist with visualization during open approach).
- **Step 2** - Incision of tissue overlying duct/gland.
- **Step 3** - Stone localization with endoscope.
- **Step 4** - Direct opening of duct with stone extraction.
- **Step 5** - Passage of scope to irrigate gland and remove remaining fragments.
- **Step 6** - Repair duct (Sialodochoplasty-SMG)

1st Line - Endoscopic Shattering (Forceps; Hand Drill; Laser)

Intracorporeal Laser Lithotripsy (Holmium; 200 micron; 2.5-3.5 watts)
Case 4
Intermediate (5-10 mm), or Fixed Parotid Salivary Stones

- 52 year old man presents with intermittent left parotid gland swelling.
- US of gland: Lymph node v. stone?
- 6 mm irregular stone found on diagnostic sialendoscopy
1st Line: Endoscopic Shattering (Basket; Forceps; Hand Drill; Laser)

Intermediate Stone (5-10mm):
Endoscopic Mobilization and Shattering (Basket, Hand drill, Laser, Forceps)
Papillotomy

Case 5
Intermediate to Large (> 5 mm), Deep (beyond scope), or Fixed Parotid Salivary Stones
- 36 year old man presents with intermittent right parotid gland swelling.
- CT scan suggests a 8 mm stone at hilum of gland.
8mm stone at hilum of right parotid

1st Line- Parotid Transfacial Approach (Endoscopic-Open)

 Technique
  ▪ Step 1- Apply NIMS; Insert scope to confirm stone is not amendable to endoscopic shattering (hard, fixed, too large); Irrigation of infection and debris; Dilation of duct (assist with visualization during open approach).
  ▪ Step 2- Raise preauricular flap
  ▪ Step 3- Stone localization with endoscope/US (needle).
  ▪ Step 4- Divide parotid fascia and gland
  ▪ Step 5- Direct opening of duct with stone extraction.
  ▪ Step 6- Passage of scope to irrigate gland and remove remaining fragments.
  ▪ Step 7- Repair duct (5.0 PDS) and close fascia; pressure dressing.

NIMS on buccal branch

Endoscopic Localization
Localization of Stone: Endoscopy

Opening of duct with direct stone extraction

Localization of Stone: Ultrasound

23 Gauge Needle with Methylene Blue

Pass scope again to remove remaining fragments
**Repair Duct**
5.0 PDS for duct and 4.0 vicryl for fascia. Apply jaw bra pressure dressing for 72 hours.

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**Transfacial Stone Removal**

Mean follow-up of 1 year
- 10/14 (71%) stone-free and symptom-free
- 3/14 (21%) stone-free and improved with intermittent symptoms
- 1/14 (7%) required follow-up parotidectomy
- Complications in 4/14 (29%)- 2 with periauricular anesthesia, 1 salivary fistula, 1 sialocele.
- Facial nerve seen in 5/14 (36%) of cases

**Case 5**
Intermediate to Large (> 5 mm) or Fixed Stones within 2 cm of Parotid Ostium
5mm stone fixed 1cm beyond left parotid ostium

1st Line- Parotid Transbuccal Approach (Endoscopic-Open) Technique
- **Step 1-** Insert scope to confirm stone is not amendable to endoscopic shattering (hard, fixed, too large); Irrigation of infection and debris; Dilation of duct (assist with visualization during open approach).
- **Step 2-** Semilunar incision anterior to ostium; divide buccinator fibers.
- **Step 3-** Localize stone with endoscopic transillumination.
- **Step 4-** Open duct and remove stone.
- **Step 5-** Repair duct (5.0 PDS) and close mucosa.
- **Step 6-** Consider ductal stent (Hood; Sialotechology)
Consider Stent

Direct Transfacial Approach
Massive Parotid Stone with Abscesses

Gland Excision
Massive Parotid Stone with Abscesses

Questions or Concerns:

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