Office Procedures in Refractory Chronic Rhinosinusitis

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Outline

- Background
- Advantages and disadvantages
- Procedures
There is good evidence that patients with refractory CRS benefit from surgical therapy compared with medical therapy.

Delaying surgical intervention not only affects symptomatology, but productivity as well.

The costs associated with lost productivity for CRS patients can be substantial.
For which patient it is appropriate?

There is no standard algorithm for determining whether a patient should be managed by an in-office procedure; therefore, a surgeon must provide an individualized approach to each patient based on their clinical presentation and objective findings.
Patient factor

Surgeon skills

Required equipment

Many patients can successfully tolerate sinonasal surgery in the office setting under local anesthesia
Not all patients are comfortable undergoing procedures while awake.

A thorough and honest discussion with the patient about the level of discomfort they may experience is paramount to selecting patients appropriately.
PROCEDURE ROOM SETUP

- **semi recumbent position**

- *There must be room to place the chair supine in case the patient has a vasovagal attack*
Protocol for emergency

- Blood pressure machine
- Continuous oxygen saturation monitoring
- An automated external defibrillator
- Oxygen tank.
- Crash cart” with appropriate medication to run a code (ie, epinephrine, atropine) should be available
Limitations

Procedures may be aborted owing to discomfort from poor access; therefore, it is important to recognize that simple and straightforward procedures performed in the operating room can become substantially more difficult in patients with a deviated septum or narrow nose.
Contraindication

- Access issues on prior endoscopy
- Allergy to local anesthetic
- Scarring from prior surgeries
- Loss of anatomical landmarks in revision cases
- Coagulopathies
Advantages

- High risk patients to GA
- Hemostasis is better
  - No vasodilation by anesthetic agents
  - Position of the head being elevated.
- Enhance topical drug delivery
- Improve the quality of life
- Provide Immediate solutions
- Avoidance of general anesthesia
- Decreased procedural costs
Steps
Decongest and topically anesthetize with 4% lidocaine and 1% phenylephrine, then place pledgets or cotton swabs soaked in lidocaine and phenylephrine at the surgical site for at least 5 to 10 minutes.
Local anesthesia

- Areas of expected dissection can be further injected with 1% lidocaine and 1:100,000 epinephrine.

- Injection is optimally performed slowly with a small needle (25 gauge).

- It is important to consider injecting areas that the scope or instruments may touch along the nasal cavity (i.e., lateral nasal wall if performing a septoplasty with sharp spur) to limit patient discomfort.
OFFICE-BASED POLYPECTOMY

IN-OFFICE TREATMENT OF MUCOCELES

IN-OFFICE SEPTOPLAST

IN-OFFICE MANAGEMENT OF STENOSIS AND SYNECHIA

STEROID-ELUTING STENTS

TOPICAL THERAPY APPLIED IN OFFICE
Surgeons can provide dramatic symptomatic improvement, especially in those with previously operated sinuses, through an office-based polypectomy.
Computed tomography (CT) imaging and endoscopy are necessary for determining if patients are candidates for office-based polypectomy.

MRI any question at all that the polyp may instead be a meningoencephalocele or tumor.

Candidates

Previous sinus surgery and have open bony ostia and sinus cavities that are obstructed with polypoid soft tissue.
Incomplete surgical dissection of multiple or thickened bony partitions may lead the surgeon to suggest a more comprehensive surgery under general anesthetic, depending on the goals of the procedure.
Electrically powered microdebriders frequently used in the operating rooms are commonly used in the clinic setting as well.

The use of coblation to remove nasal polyps has shown some promising results with respect to mucosal healing and decreased blood loss in human subjects, but has not been as adopted widely.

Removal of pedunculated nasal polyps should have minimal bleeding and cause minimal discomfort to patients.

If bleeding does occur or the patient experiences discomfort, the use of pledgets soaked in 1% lidocaine with 1:1000 epinephrine will help with both visualization and pain control.
Complications

- Cerebrospinal fluid leak
- Sphenopalatine artery Injury
  - If the vessel is inadvertently cut, direct cauterization over the mucosa can be performed, although this will likely be quite uncomfortable for the awake patient,
  - or a nasal pack can be placed and the patient taken to the operating for a formal sphenopalatine artery cautery or ligation
- Orbital hematoma
- Extraocular muscle damage
- Blindness
IN-OFFICE TREATMENT OF MUCOCELES

**Indication**

- Patients who have undergone prior sinus surgery will often present with mucocele formation whether from scarring and entrapped secretions, or lateralization of turbinate

- Good candidates for in-office procedures for frontal sinus mucoceles are
  
  - Previously operated patients with mucoceles presenting at the level of the frontal sinus ostia, or at least low enough to be easily accessed with endoscopic instrumentation.
Endoscopic drainage of mucoceles can be successfully done in the office setting

Marsupialization can be achieved with the usual frontal instrumentation of Kerrison, Hoseman, and angled giraffe through-cuts in the office.

The entire lining does not need to be removed as long as there is an adequate opening made to prevent reformation of the mucocele and there is no blockage of surrounding structures.

In a similar fashion, mucoceles in the ethmoid, sphenoid, and maxillary sinuses in previously operated patients can be treated in the clinic.
IN-OFFICE SEPTOPLASTY

- An endoscopic septoplasty can be performed while the patient is awake in a similar fashion to when in the operating room.

- The potential limitation is the
  - Management of the maxillary and palatine spine
  - The use and sound of heavier instrumentation can be disturbing for some patients if fully awake, and one may need to consider intravenous sedation.

- The optimal patient for an in-office septoplasty is one with an
  - Isolated spur or limited cartilaginous deflection
IN-OFFICE MANAGEMENT OF STENOSIS AND SYNECHIAE

- The most common procedures performed in the clinic address postoperative changes secondary to sinus surgery, to keep ostial outflow tracts patent and prevent or address mucus recirculation.

- If a surgeon sees the beginnings of scar formation early in the postoperative period, appropriate debridement at this time can prevent mature scar formation.
Fig. 5. Balloon sinuplasty device. (Courtesy of Acclarent, Irvine CA; with permission. © Acclarent, Inc. 2017.)
Balloon ostial dilation was initially coined “balloon sinuplasty” by Acclarent (Menlo Park, CA) in 2005.

The goal of balloon dilation is to dilate the sinus outflow paths without actually removing tissue from the sinus cavity.

There are a number of safety and feasibility studies, most of which have been done when sinus dilation has been performed in the operating room, with patency rate ranging from 85.1% to 91.6%.

A large retrospective review by Levine and colleagues showed that 73.8% of 1036 patients maintained improved symptoms at a mean follow-up of 40.2 weeks.

A multicenter prospective trial, specifically assessing outcomes of balloon dilation in the office, showed significant reduction of disease specific quality of life measures (P<.0001) at 1 year with significantly fewer acute sinus infections (P<.0001), less antibiotic use (P<.0001), and fewer physician-related visits (P<.0001).

A recent systematic review showed subanalysis of patients solely undergoing balloon dilation in the office setting having a significant reduction in the impact of disease-specific quality of life measures, but not as great as those receiving the treatment in the operating room.

Need for unbiased research in this area further evaluating outcomes of balloon dilation in the office setting.
Possible Complications

- Fairly safe in the office setting
- The reported major complication rate per sinus is calculated at 0.0035% in the operating room.
- The US (FDA) has reported 3 complications secondary to balloon dilation when performed in the operating room.
- Two involved penetration of the lamina papyracea
- One patient had a cerebrospinal fluid leak
- Recent systematic review of balloon dilation in the office could not make conclusions on the safety of the procedure, but prior large studies have shown it to be safe in the office setting.
Steroid-eluting stents can be a viable option in scenarios that require a continued slow release of topical steroids in patients with nasal polyposis despite complete functional endoscopic sinus surgery.

Steroid-eluting stents were initially placed intraoperatively within the open ethmoid cavity to preserve sinus patency and reduce medical and surgical interventions after surgery and showed promising results.
Further studies showed the in-office placement of steroid-eluting stents into the open ethmoid cavity in postoperative patients was safe, feasible, and effective.
Patient Selection

There is no defined population that steroid-eluting stents are used for among patients with CRS, but the stent is used primarily for:

- Patients who would benefit from topical steroid delivery.
- Patients with refractory CRS with nasal polyps who cannot tolerate oral steroid therapy
- Cannot tolerate or cannot obtain topical steroid irrigations
- Lateralizing turbinate
Evidence

- This practice is based on a recent study by Han and colleagues, who performed
- RCT
- 100 patients with CRS with nasal polyps refractory to medical therapy
- Candidates for revision FESS
- Results: showed a symptomatic improvement and statistically significant reduction in polyp grade

The only implant that has FDA approval is a product called Propel Steroid-Releasing Implant.

It has 370 mg of mometasone furoate within polymer matrix allowing for the diffusion of the drug over time, and the implant is expected to dissolve within 30 days.

There are a number of other steroid-eluting stents available, but only Propel is discussed because it is the only product with FDA approval (in the operating room).
Patients are best seen around 1 month postoperatively for debridement of any remaining matrix material.

The stent may be removed earlier if crusting on the stent impedes sinus drainage.
Possible Complications

There have been minimal adverse effects reported in the trials using the Propel stent, which include infection, crusting, and granulation tissue formation.

These complications usually can be avoided with appropriate follow-up.

With other sinus implants that are not FDA approved, major complications such as orbital violation resulting in severe orbital pain and permanently dilated pupil have been reported.

There is a few therapies that have been used in the office setting and may provide an option for those who have exhausted all forms of conventional therapy in this challenging subset of patients.
The general goal of topical antibiotic therapy is to deliver high concentrations of antibiotics while limiting the systemic absorptions and associated side effects.

Approximately 30% of cultures are positive for Pseudomonas aeruginosa or methicillin-resistant Staphylococcus aureus after functional endoscopic sinus surgery.

Topical Chemical Surfactant

Baby shampoo

- Can be added to a patient’s own home saline irrigation, but in-office direct irrigation with an endoscope may help to address the direct source of biofilm.

- Showed that 1% baby shampoo nasal irrigations reduced thickened nasal secretions and postnasal drainage.

More research regarding chemical surfactants is required with respect to safety.

Impregnated Topical Gel Therapy

Alava, used 2 to 10 mL of 1200 mg/5 mL of mometasone furoate gel in symptomatic patients after functional endoscopic sinus surgery and noted improvement in their symptoms and a reduction in the amount of topical and oral steroids used. Further research is required to determine the long-term efficacy. They are not currently FDA approved.

Patients suffering from persistent biofilm may benefit from (PDT) in the office setting.

In vitro studies have shown that photodynamic therapy reduced CRS polymicrobial biofilm by greater than 99.99% after a single treatment.

An in vivo study using 23 symptomatic patients with CRS after surgical showed objective and subjective improvement.

Need more research.

Choosing the appropriately tolerant patient to undergo office procedures will increase your chances for success.

Procedures commonly done in the operating room can be performed in the office, if the appropriate anesthetic and patient monitoring is in place.

Knowing the relative contraindications for specific in-office procedures will help to avoid complications.
Reference

Andrew Thamboo, MD, MHSc, FRCSC, Zara M. Patel, MD* Office Procedures in Refractory Chronic Rhinosinusitis, Otolaryngol Clin N Am 50 (2017) 113–128
Thank you