Balloon Sinuplasty
Patient Selection

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Outline

• What is sinusitis?
• Are there subtypes of sinusitis?
• How do we measure sinusitis?
• What is sinus pain?
• Are sinusitis and sleep related?
• What disorders mimic sinus pain?
Outline

- Who is a good candidate for balloon sinuplasty?
- Who is a good office candidate?
- Technical considerations?
What is Sinusitis

- *Rhinosinusitis* is defined as symptomatic inflammation of the paranasal sinuses and nasal cavity. The term *rhinosinusitis* is preferred because sinusitis is almost always accompanied by inflammation of the contiguous nasal mucosa.
Sinusitis Sub-classification

- Uncomplicated/ Complicated
- Acute / Chronic
- Bacterial/ Viral
- Allergic
Measurement of Sinusitis

- Lund Mackay score: Should you operate on patients with minimal CT scan abnormalities?
- SNOT 22 added nasal stuffiness and smell taste disturbance: Should you operate on people with low SNOT 22 scores?
Starting Point Myths

- Surgery should not be performed on patients with minimal CT findings
- Surgery should not be performed on patients with sinus headache
- The eyes do not cause headache or dizziness
- Treating sleep disorders do not improve sinusitis
Binocular Vision Dysfunction

- Vertical Heterophoria: high eye, utricle dysfunction, roll tilt
- Superior oblique palsy
- Abnormal binocular vision questionnaire
• Identification of Binocular Vision Dysfunction (Vertical Heterophoria) in Traumatic Brain Injury Patients and Effects of Individualized Prismatic Spectacle Lenses in the Treatment of Post-concussive Symptoms: A Retrospective Analysis

• Jennifer E. Doble, MD, Debby L. Feinberg, OD, Mark S. Rosner, MD, Arthur J. Rosner, MD

• *PM R* 2010;2:244-253
Symptoms

- Dizziness
- Headache
- Head Tilt
- Nausea
- Anxiety
- Problems Reading
- Unsteady While walking
- Motion Sickness
- Neck Pain
Otolaryngology Examination

- Head tilt
- Vertical and horizontal disparity between the eyes
- Convergence insufficiency
- Duplication of symptoms with eye movements
Transient Diplopia or Blurred Vision
Treatment with prism glasses

- Over 8000 patients treated locally
- Optometrists trained in 8 other states
Binocular vision dysfunction

- 80% reduction in severity of dizziness and headache
- 50% reduction in frequency of BVDQ
- 50% reduction in neck pain
- 30% reduction in anxiety
(VEMP) Vestibulatatr evoked myogenic potential

- Occular VEMP measures utricle dysfunction and correlates body sway
- Cervical VEMP has been associated with SSCD Superior semicircular canal dehiscence, may be related to POTS and dysautonomia
Narcolepsy

- Vivid dreams
- Dream before sleeping
- Dream during naps
- Tired all the time
- Sleep paralysis
- Cataplexy
Narcolepsy

- Normal STOP BANG questionnaire
- Abnormal Epworth sleepiness scale
Narcolepsy

- Low orexin or hypocretin measured in cerebral spinal fluid
- Producing cells in hypothalamus damaged likely by a virus
- Normal sleep study
- Short Multiple Sleep latency Test
- Two SOREMP sudden onset REM sleep during naps
Narcolepsy

- Frequent sinusitis and URI’s
- Low Pneumococcal titers
- Stopped getting sick with treatment with stimulants and Pneumovax
Surgery for sinus pain

- ESS performed on 80/211 patients.
- ESS helped 66/80 that had surgery
- Medicines from ENT or neurology helped others for total positive outcome of 90%
Balloon sinuplasty Orios study

Orios study

- Safe as FESS in the operating room
- Similar reduction in SNOT 20
- Snot 20 most improves subgroups were facial pain, and slept better at night.
Results: SNOT-20 Subscores

Baseline - 52+ weeks
SNOT-20 subscore change

- All SNOT-20 subscore changes statistically significant (P <0.0001) at 52+ weeks post procedure (after multiplicity correction)
- Top ranking changes in fatigue-related symptoms consistent with prior studies of effects of traditional FESS

Index patient

- Joe, engineer with facial pain worse at night, repeat URI, and sinusitis
- Deviated septal spur to the right
- Facial pain worse in the opposite maxillary sinus
- CT scan normal
Index patient

- Excel spreadsheet of nocturnal pain every 90 minutes in the early night and every 60 minutes early in the morning
- Correlation with REM sleep cycles
- Complete resolution of symptoms and normal SNOT 22 with septoplasty and balloon dilation of the left maxillary sinus
Sleep fragmentation

- Increases TNF alpha, IL1 and IL6
- Narcolepsy has decreased IGG1 and IGG2
- Idiopathic hyper-somnolence has increased TNF alpha and decreased IGG2
Sleep disruption chronic pain

- Increase IL1, c-reactive protein, TNF alpha, IL6
- These cytokines increase slow wave sleep and decrease REM sleep
Pain

- TNF alpha and IL1 increase pain at sinus receptor site
Sinusitis

- IL1B, IL6 and IL8 are elevated in acute sinusitis
Polymorphisms

- IL6 subtypes have increased chronic sinusitis
- Subtypes of TNF alpha, IL1B, IL6, and IL8 show differences in severity of influenza


5. Mullingtin JM; Simpson NS; Meier-Ewert HK; Haack M. Sleep loss and inflammation. Best Pract Res Clin Endocrinol Metab. 2010 October; 24(5): 775-784


7. Zhang M; Cai C; Chen N; Wang S. The association between genetic polymorphisms of IL-6 and the susceptibility of chronic rhinosinusitis. Lin Chung ER Bi Yan Hou Tou Jing Wai Ke Za Zhi. 2012 Mar;26(5):197-200,204.

8. Morales-Garcia G et al. Pandemic influenza A/ H1N1 virus infection and TNF, LTA, IL1B, IL6, IL8, and CCL polymorphisms in Mexican population: a case control study. BMC Infect Dis. 2012 Nov 13;12:299
Indications Sinus pain

- Intermittent ostial occlusion
- Uncinate pain
- Barotrauma
- Whistling or squeaking from the sinuses
- Sinus pain that disturbs sleep
Contraindications sinus pain

- Binocular vision dysfunction
- Chronic daily or rebound headaches
Contraindications to office balloon

- Unable to speak English
- Anxious patient
- Bleeding disorders
- Patient needing monitoring
- Polyps, deviated septum
Case 1

- 20 female 5 foot 2 chronic sinus infections and pain
- Narrow OMC bleeding and scarring after
- Return to or with propel stents
- Some residual scarring postop CT No sinus opacification
- Treated for narcolepsy and pneumovax
- Treated for Migraine
Case 2

- 50 year old male s/p MMA for OSA
- Device not long enough multiple passes
- Scarred OMC return to OR for revision and propel stents
- 2 years later re-stenosed revision balloon with stents
- Seeing ID for resistant organisms
Office pearls

- Bright light on trans-illumination
- Oral sedation
- Good local anesthesia
- Start with easy cases first
- Perform laying down
- Allow enough time
Pearls

- Avoid bleeding
- Use image guidance
- Cotton better than cottonoids if narrow
- Avoid middle turbinate damage
- Place gel directly
- Avoid local in the pharynx
- Avoid over advancing the maxillary guidewire
Pearls

• Keep metal away from image guidance transducer
• Know your equipment