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A mucocele of the paranasal sinus is a benign process. *

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Thirty-seven million Americans suffer with chronic sinusitis. Chronic sinusitis is defined as sinus inflammation and symptoms lasting greater than three months. The sinus lining which produces mucous becomes thickened from the inflammation and blocks the natural outflow tracts of the sinuses. This causes the symptoms of headache, congestion, drip, facial pressure around the eyes and forehead, cough, fatigue, smell and taste disturbance and fever. Adults produce one to two liters of mucous a day. When the normal outflow tracts are blocked and unable to drain, the mucous builds up causing these symptoms. The clear mucous turns thick, then white, yellow and finally green. Bacteria cause the infection at this point but the initial blockage could be secondary to a virus, allergy, polyp, trauma or a growth.

* Coexistence of a Nasal Mucoepidermoid Carcinoma and Sphenoid Mucocoeles: CT Diagnosis and Treatment Implications. Schaeffer, BT; Som, PM et al. Journal of Computerized Tomography, 4(4): 803-805, July-Aug 1985
When the mucous is completely trapped inside the sinus because the outflow tracts are blocked, the sinus walls will slowly expand over a period of time. This may occur over many months or years.

The bony walls are thinned out due to pressure exerted by the mucous in a closed space. The bony walls are thinned out symmetrically in a round smooth fashion. This can occur in any of the sinuses but more commonly in the frontal and ethmoid sinuses. The enlarged fluid filled sinus caused by slow expansion by a benign process is called a mucocele. When the mucous filled sinus is infected it is called a mucopyocele. When sinuses expand beyond the sinus cavities they may impinge on the orbit or brain causing complications of sinusitis.

Radiologic imaging properties are diagnostic when using CT or MRI scans. CT modality delineates the bony structures as opposed to MRI that tend to subtract bone signals. MRI with and without contrast helps in delineating the soft tissue signal. Separation of the mucocele from the orbit or brain structures is best seen with this modality. A malignant process is favored with significant irregular bone erosion verses remodeling or symmetrical thinning of the bone structures.

Mucoceles require surgical intervention and can usually be treated with endoscopic sinus surgery. Differentiation of a mucocele from a very common mucous retention cyst needs to be clarified. Normal CT scans of the sinus may contain a retention cyst in 10-40% of asymptomatic patients. These are benign, small fluid filled or solid polyloid growths inside the sinus, which may or may not contribute to sinusitis. If they are by the outflow tracts they may be the cause of a sinus infection. Their size may wax and wane with an acute exacerbation of sinusitis. Depending on the size and location will determine whether a mucous retention cyst needs to be removed.

Mucoceles are expansile lesions of the sinus, which could expand into surrounding structures of the eye and brain causing complications of sinusitis. Endoscopic drainage is usually feasible and curative. The possibility of a co-existent tumor should be excluded. The following four cases illustrate these points.
Histories of illustrated cases of mucoceles

CASE #1 A 20 year old female went to her neurologist with headaches. A MRI was performed which identified an ethmoid-mucocele from a concha bullosa. An endoscopic drainage of a mucopyocele was performed.

CASE #2 Fronto-ethmoid mucocele was noted on scan after the patient complained of unilateral congestion for several months. Endoscopic exam of the nose revealed a unilateral middle meatal polyp. Imaging studies showed expansion of the ethmoid from a concha bullosa infection and expansion of the frontal sinus with posterior table erosion. Endoscopic drainage was performed of a mucopyocele.

CASE #3 Bilateral sphenoid mucocele. This patient presented to his local hospital with severe headaches without fever. A CT and MRI showed bilateral sphenoid mucoceles. The sella and lateral recess of right sphenoid sinus was eroded. The patient was transferred to my care at LIJ. This patient underwent bilateral endoscopic sphenoidotomy with removal of posterior septum and drainage of infected mucus under pressure. The mucocele was drained. There was abnormal tissue in the sphenoid sinus consistent with a sinus tumor. Tissue for biopsy was inconclusive. Patient has declined further biopsy.

CASE #4 Frontal Mucocele. 45-year-old male noted his left eye pushed down and out. He denied diplopia. CT/MRI showed posterior table erosion of the frontal sinuses and orbital rim erosion. This was initially drained endoscopically but there was residual soft tissue mass which pathology disclosed as inverted papilloma. A subsequent craniotomy was performed. The frontal sinus was cranialized and frontal duct had the mucosa removed with a drill. The naso-frontal duct was occluded with muscle.

See You Tube video LINK of these cases on Dr. Schaeffer’s Channel: NOSEMD
Mucocele endoscopic sinus surgery video

Dr. B. Todd Schaeffer is a board certified endoscopic sinus and skull base surgeon. He is the chief and associate chair at North Shore University Hospital in Manhasset in the Department of Otolaryngology-Communicative Disorders. He has been performing advanced endoscopic sinus surgery for over twenty years. The past seven years he has partnered with neurosurgeons to endoscopically remove brain tumors through the nose. Dr Schaeffer can be reached at (516) 775-2800