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Technical Note

Role of balloon Sinuplasty in the management of solitary maxillary sinus polyp

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Balloon sinuplasty is relatively a new and novel technique in rhinology. Its exact role in management medically resistant sinusitis, indications, limitations and long term efficacy are still under evaluation. Herein we report a case that had solitary maxillary sinus polyp and treated unintentionally by this method. Patient's symptoms didn't resolve after surgery and had to underwent endoscopic sinus surgery which was effectively improved her condition. Difficulty in diagnosis of this rare pathology and its management dilemma in relation to sinuplasty are discussed.

INTRODUCTION

Endoscopic sinus surgery is a major innovation in the rhinology field that is mainly indicated for medically resistant chronic sinusitis. The main procedure philosophy is to preserve mucosa and open sinus ostium thus allowing ciliary function and inflamed mucosa to retain to normal.

Advancement in surgical industry improves safety and the effectiveness of the procedure; however complications such as bleeding, scarring, synchia and orbital or intracranial entry are still reported.

The success of catheter technology in other medical disciplines encourages the introduction of this innovation in sinus surgery. Sinuplasty is a less invasive procedure than endoscopic sinus surgery and has fewer mucosal injuries. The procedure can be performed under local anesthesia as an office setting permitting a rapid recovery time.\(^ 1,2\)

It is obvious that there are certain pathologies that can't be addressed with this technology. Sinonasal polyposis, mucocele, allergic fungal sinusitis, sinonasal osteoneogenesis, cystic fibrosis and ciliary dysfunction are examples of these disorders.\(^ 3\) Distorted sinus anatomy, anatomical variations in ostiomeatal complex such as concha bullosa, haller cell as well as severe nasal septum deviation are relative contraindications.

Solitary Maxillary sinus polyp is less common than ethmoid polyposis and has different pathogenesis, presentation, management and outcome. The presence of clefts in the ethmoid labyrinth instead of discrete ostia, as in other sinuses, and the ill-defined junction between ethmoid and nasal mucosa are anatomical factors that probably make these differences.

In the pre endoscopic era, maxillary sinus polyp and other maxillary sinus lesions used to be approached through radical antrostomy (Caldwell-Luc operation). Endoscopic sinus surgery and powered instruments allowed medial access to the sinus and thus many of these pathologies can
be removed through the nose especially when a wide middle meatus antrostomy performed. The endoscope can also be used through a small sub labial trephine to approach more laterally located disease.(4-6)

There is a lack of evidence in support or against using sinuplasty technique in management solitary maxillary polyp. Herein we report our experience in treatment maxillary sinus polyp with sinuplasty.

**CASE DESCRIPTION**

45 year old medically free lady referred to our rhinology clinic in Prince Hamzah Hospital, (Amman, Jordan), complaining of 6 months history of left sided facial pressure and post nasal drip. Other nasal symptoms were negative. Past, drug and social history were insignificant. She had been on two different antibiotics and nasal spray with mild improvement.

Findings on Rigid nasal endoscopy were limited by the patient cooperation and the congested nasal mucosa. Sinus CT scan was organized and revealed obstructed left maxillary sinus ostium with nearly completely opacified sinus cavity, (Fig. 1). The patient was consented for Balloon sinuplasty. The procedure was performed under local anesthesia. Neuropaties soaked with adrenaline 1:1000 were placed under endoscopic guidance in the left middle meatus, on front of the middle turbinate, anterior nasal septum and the inferior turbinate. After ten minutes, the patties were removed. 10 cc of 2% xylocaine in 1:100,000 adrenaline was injected on the superior part of the middle turbinate, axillary flap area, inferior border of the uncinate process and the anterior part of the inferior turbinate. After confirming the position of the balloon (RelievaLumaTM, Acclarent, CA, USA), it was inflated to 10 atmospheric pressure across the maxillary ostium, deflated and then removed. The maxillary sinus was inspected through the dilated ostium, a hanging polyp was seen. The patient was uncooperative to further widening the main ostium with through cutting forceps to get enough access to remove the polyp. She was discharged home 2-hours after the procedure on Augmentin, nasal spray and encourage continuing nasal irrigation.

One week later and at the first follow up visit, she denied any major improvement in her symptoms. Endoscopic exam showed patent left maxillary sinus ostium. She was instructed to continue on her medical treatment and short course of oral steroid added. She returned back to the clinic after one month with mild improvement. Sinus CT scan was ordered; it showed a patent maxillary sinus ostium with persistent maxillary sinus polyp, (Fig. 2). The patient scheduled for endoscopic sinus surgery, she underwent uneventful surgery and followed up for 6 months with free nasal symptoms.
DISCUSSION

As any newly introduce technology in medicine, indications and contraindications of sinuplasty, limitations, and modifications in technique will continue to emerge until long-term studies will be able to determine its efficacy and establish its ultimate place in the treatment scheme of sinusitis.(7)

Healthy middle age patient with a single sinus infection is the ideal candidate to get the maximum benefit of this novel technology. The procedure in such group of patients can be easily performed under local anesthesia with rapid time recovery.

Visualization of the maxillary sinus ostium is usually obstructed by the uncinate processes which harden getting preoperative diagnostic biopsy. Maxillary sinus polyp, retention cyst, severe inflammation and other pathologies can give the same radiological appearance in CT scan making preoperative differentiation between these very difficult. These disorders are usually diagnosed intraoperative or after when post-operative pathology slides examined. Probably we wouldn’t offer our patient sinuplasty alone if we were sure that the pathology inside the maxillary sinus was a solitary polyp.

Although the etiology of nasal polyps remains controversial, there is a general agreement between rhinologists that the common ethmoid polyps differs than those rarely seen in other paranasal sinuses. According to Bernstein, ethmoid polyps originate from contact areas of the middle meatus, especially the narrow clefts in the anterior ethmoid region that create turbulent airflow particularly when narrowed by mucosal inflammation. Ulceration or prolapse of the submucosa followed with reepithelialization and new gland formation. During this process, a polyp can form from the mucosa because the heightened inflammatory process from epithelial cells, vascular endothelial cells, and fibroblasts affects the bioelectric integrity of the sodium channels at the luminal surface of the respiratory epithelial cell. This response increases sodium absorption, leading to water retention and polyp formation.(8)

Obstruction of maxillary sinus ostium plays a key role in maxillary sinus polyp etiology. A widely accepted theory in its pathogenesis is that it originates from a submucosal cyst secondary to thrombosis of lymphatic vessels caused by a post-infection sinus inflammation. The fact that the maxillary sinusitis is more common than sphenoid and frontal sinusitis may explain why polyps in these sinuses are less frequent than in maxillary sinus.(9)

In summary we found balloon sinuplasty alone is inappropriate surgical method to approach maxillary sinus polyp. Even with dilated patent sinus ostium the pathology couldn’t restore. It is important when consenting patients for sinuplasty to stress the possibility of changing or combine this technique with the classic endoscopic sinus surgery.

REFERENCES