

Comparison Between the Medical Versus Surgical Interventions for the Management of Nasal Polyp

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Abstract: Nasal polyps is an inflammatory condition affecting the nose and sinuses which is non-IgE-mediated and is often associated with the chronic non-allergic rhinitis, non-allergic asthma, and aspirin intolerance. Although the etiology of nasal polyps is not clear, the foremost symptoms include the nasal obstruction and a disturbed sense of smell. The nasal passage blockage could be treated by polypectomy to maintain the patient breathing through the nose in case a few large polyps are present. The use of surgical procedures can be performed which mainly depends on the severity of the disease to restore the physiology of the nose and to make the nose free from the polyps' drainage of the infected sinuses. The medical treatment of the polyps is essential because the surgical interventions are unable to deal with the inflammatory process of the nasal mucosa. The topical corticosteroids remained the drugs of choice for the reduction in the polyps' size and to prevent the recurrence following surgery and are frequently the main treatment choice in most patients. The use of fluticasone propionate and beclomethasone dipropionate was found to be effective as a medical tool in the management of polyposis. The short-term use of systemic corticosteroids is also an option which can be used for the control of nasal polyps. Still, most patients having nasal polyps are treated by using the combination of medical and surgical procedures.

Keywords: Nasal polyps, inflammation, corticosteroids, surgery, polypectomy

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Nasal polyps are more common in pediatrics, young people, and as well as in old age people. It affects 4% of the population in the whole world. Nasal polyps have unknown etiology and associated with the allergy, asthma, rhinorrhea, postnasal drops and more common facial pain. They are benign lesions arising from the nasal cavity mucosa (1). Computed Tomography (CT)-scan is key to detect the presence and extent of nasal polyp. This scan information assists the surgeon in pre-operative planning. This scan takes in coronal, sagittal, and axial plans. Better visualization of the nasal polyps occurs in 3 mm slice thickness. Nasal polyps can be treated through surgical removal and as well as the corticosteroids (1). They are reported and associated with respiratory disorders like aspirin sensitivity and cystic fibrosis (2). Major symptoms of the NP are the nasal blockage, loss of smell, rhinorrhea. NP can be evaluated through the nasal endoscopy and computed tomography (CT)-scan (3). The aim of the study was to review nasal polyps diagnosis through the computed tomography scans with a focus on the surgical versus medical treatment effectiveness for the patients.

NASAL POLYPS

Nasal polyps have a characteristic appearance and usually observed bilaterally. They are bright, moveable, and mostly arise from middle turbinate surfaces and from the hiatal semilunaris. Nasal polyps are mobile and rarely bleed. There are different types of nasal polyps including antrochoanal polyps, Inflammatory polyps, Nasal polyps due to the cystic fibrosis. Antrochoanal

polyps were 1st described in 1753 and it was found that nasal polyps filling the space of nasopharynx and extending below the uvula (4). Inflammatory nasal polyps are caused by upper airway tract inflammation having unknown etiology. Eosinophilic dominance is seen in these polyps (5). Cystic fibrosis can cause chronic rhinosinusitis (CRS). Cystic fibrosis-related nasal polyps demonstrate an eosinophilic dichotomy (6)

PATHOGENESIS OF NASAL POLYPS

Nasal polyps is the chronic inflammation of the nasal cavity and characterized by the cellular infiltration and stromal edema (7). Studies show that histological feature of nasal polyps are not relevant to skin prick test positivity but to the eosinophils (8). Nasal polyps are closely associated with systemic diseases. The association between nasal polyps and fungal infections is well established (9). Norepinephrine quantity is higher in the base of the nasal mucosa as compared to normal mucosa which could produce the adrenergic receptor-mediated vasoconstriction leading to mucosal congestion and edema.

HISTOPATHOLOGICAL FINDINGS

Nasal polyps are free from the nerves. Patients of the nasal polyps without cystic fibrosis show extensive thickening of epithelial membrane extending into the submucosa. Stromal eosinophil count is high. Usually, the cells consist of the lymphocytes, eosinophil and plasma cells with numerous neutrophils. On the other

hand, patients with the cystic fibrosis have a slightly visible basement of surface epithelium without any submucosal hyaline. In non-cystic fibrosis polyps, nasal polyps show the features of ulceration, epithelial damage and remarkable de-squamization (10). As per histology, nasal polyps are characterized by reducing vascularization, reduced glandular tissue, fibrosis, edema along with damaged epithelium (11). Histological evaluation, demonstrate a rough distinction between the eosinophilic polyps and neutrophilic polyps in 65-90% cases. Up to 25% of cases show that the nasal polyps are characterized by the eosinophil inflammation, intrinsic asthma is associated with 40% of cases of nasal polyps (12).

Nasal polyps; recent findings: Nasal polyps are chronic inflammation of the nasal and paranasal sinuses but having unknown etiology. Early symptoms of NP are rhinorrhea, sneezing, and loss of smell. Nasal polyps have previously reported an association with asthma and other respiratory diseases, primary ciliary dyskinesia, aspirin sensitivity and cystic fibrosis. Nasal polyps are not life-threatening but have a considerable impact on the quality of life (10). A study has reported the impaired quality of life when nasal polyps are associated with asthma. A significant improvement was observed after 6 to 12 months of medical and surgical interventions (13). Steroid treatment and sinus surgery lead to similar improvement in the quality of life, either Nasal polyps are with or without asthma. People with nasal polyps after surgical or medical treatment have a better quality of life. Nasal polyp's management should rely on medical treatment and in the case of drug failure surgical treatment should be performed. Nasal polyps' size and symptoms were improved after the surgical and medical treatment for 6 to 12 months (14).

A recent study demonstrated the comparison between the surgical removal of the nasal polyps and systemic steroid treatment which was performed on n=53 patients. The steroid treatment results were observed after one year. The results between the surgical and medical treatments were very much alike. Clinical experience showed that surgical treatment should be preferred but it has certain complications to the patients like bleeding and deformity (15), on the other hand medical treatment (systemic steroid) not advocated. Seventy two percent of patients showed an improvement in the CT scans who were treated with steroids orally (16).

The conclusion of the recent studies was that systemic and local steroid should be used for the primary treatment of polyps. Surgical removal should only be performed in complicated cases. Complications were negligible in both medical and surgical treatment. No doubt the management of nasal polyposis is a disputed subject without any doubt, but the medical treatment remains undisputed. The long-term use of medical treatment (systemic and topical corticosteroids) scares the patients.

But the surgical treatment leads to the bleeding for a few days after surgical intervention/ procedure. Medical and surgical treatment was successful in 85% among patients; over the follow-up period of 3 years. Only 15% had to undergo surgery after medical treatment. The studies have shown that long term use of the corticosteroid improves the polyp's size and reduce the symptoms. Most authors debated that medical treatment should be preferred but if there is no considerable improvement then surgical treatment should be the second choice (17).

RADIOLOGICAL FINDINGS

For the investigation of the nasal polyps' plain x-rays are not sensitive for the detection of the nasal polyps but it shows the ossification of the affected sinuses (18, 19). Computer tomography (CT)-scan is most effective for the detection of the nasal polyps, it shows the extent of the nasal polyps and shows the anatomical variations. CT- scan shows the staging of the nasal polyps and for this purpose Lund-Mackay system was used. This system consists of the score from 0-2 and this score show the absence of opacification, partial or complete opacification of every sinus system.

This system was validated but correlation didn't satisfy for the further outcomes (19). The best procedure of imaging system of paranasal sinuses is the CT-scanning in coronal, axial and plans reconstruction (20). With the modern generation of the equipment, magnetic resonance imaging using an alternative to see the inflammation of the sinuses (21). The CT scan is performed before the endoscopic surgery, medical and surgical treatment for the assessment of nasal polyps (22). CT scan was used to analyze sinus symptoms. Pre-operative and post operative Lund-Mackay score was evaluated by sinus computed tomography scans. Post operative CT scan was performed between 12-18 months after surgery in all cases and compared with CT Scan results of pre operative patients. A score of "0 to 24" was calculated as per Lund and Mackay (23).

Nasal polyps' classification can be based on the microbiology, magnetic resonance imaging, CT scan, and immunological evaluation. A recent study showed that patient who had positive skin test had a higher frequency of polypectomy as compared to the patients with negative skin test (5).

Treatment of nasal polyps: Topical corticosteroid is used to treat the nasal polyps. As eosinophilia is associated with nasal polyps, corticosteroids majorly exert a specific effect on eosinophils that's why we use the corticosteroid to suppress the eosinophil's inflammation and production of the eosinophil (24). Even after the surgery corticosteroids are also used for 6-12 months. Postoperative steroid treatment which lasted for months also improved wound-healing (25).

A significant improvement in the CT scans was observed in 72% of patients treated with oral steroids (26). According to a study, there were one hundred and thirty-nine patients who had undergone FESS (functional endoscopic sinus surgery) from 1985 to 1990 for those patients who had constantly chronic sinusitis and nasal polyps and were not responding to common medical therapy (intranasal steroids, antibiotics) and to surgical therapy in some cases (27). Systemic corticosteroids in low dosage given to the patients for the treatment of the polyps lasting several months could delay the surgical process which was seen approximately 80% of all cases. However, fall back of nasal polyps was recorded in over 50% of patients having steroidal therapy. A meaningful improvement was observed in those patients who have nasal polyps after medical and surgical treatment. Such interventions improved quality of life in patients with NP and especially improved the patient's body pain, vital force, social functioning, and general health. All nasal symptoms distinctly improved after topical and systemic steroids or endoscopic sinus surgery treatments (28).

Combined therapy of oral and intranasal steroids is most effective to treat the NP and this combination also reduces nasal obstruction, improves the sense of smell and other NP associated symptoms. Recent endoscopic sinus surgery improves the nasal symptoms in patients with nasal polyps (4, 29). Only medical treatment improves the nasal symptom scores, but the surgery had added the advantage of nasal obstruction reduction and secretion (30). The initial medical treatment consists of a 6-week regular dose of Dexamethasone-Rhin spray (DRS) and an alkaline nasal drop. The 20mg standard measurable dose of DRS was delivered into nostrils twice a day.

Patients enduring from the chronic rhinosinusitis with nasal polyposis received a 12-week course of fluticasone propionate drops with the dose approximately 400 mg twice daily into each nostril (31).

After endoscopic sinus surgery, all patients have prescribed 500 mg erythromycin, DRS twice daily for 2 weeks. After the surgical treatment, the patients should advise to continue the intranasal sprays and corticosteroids. Both steroids and endoscopic sinus surgery reduce the polyp size but this effect was significantly higher in patients treated by ESS when compared with steroid therapy alone (32). Previous studies demonstrate that intranasal steroids are most effective for the reduction of the polyps' size. The research demonstrated that there was 56.4% reduction of polyp size after 1 year of combined steroids treatment (33). Reduction in polyp size after ESS than steroid treatment (30). The treatment of nasal polyposis is debated. Surgical or medical treatment or both have been recommended as the treatment of choice (34). A number of studies have reported good results after endoscopic sinus surgery and major improvement of nasal blockage were seen in the patients of nasal polyposis (23). At least

1 month before surgery medical treatment should be used in typical nasal polyposis patients because some studies have demonstrated that, even surgery is not required in some cases after medical treatment (35). Sometimes the infection is also observed due to blockage of the nasal cavity by nasal polyps. Different antibiotics can further stop the growth of the nasal polyps can reduce the bleeding during and after surgery. Antibiotics are very effective to reduce the growth of staphylococci, streptococci and anaerobic bacteria commonly found in chronic sinusitis. Corticosteroids are the treatment of choice for nasal polyps and chronic sinusitis because they have anti-inflammatory effects (36).

SURGICAL INTERVENTIONS

For routine nasal polyposis, polypectomy is not the treatment of choice. In the recent research, the author reviewed 167 patients they were verified with the nasal polyps. 86% (143) patients had polypectomy. 24% (34) patients had the two to three times polypectomies. 15 % (22) patients had four or more polypectomies. 12 % (17) patients had five or more polypectomy. The 8% (11) patients had six or more polypectomy. Three patients have 20 polypectomies. Surgical polypectomy does not remove permanently (37). A study found that corticosteroids are least effective as compared to surgical polypectomy (38). In previous research, there were 120 patients with the inflammatory sinus disease who had functional endoscopic sinus surgery FESS. Patients age ranged were 15 to 77. Eighty-five patients (71%) had undergone previous surgery. Conventional sinus surgery, endoscopic sinus surgery, turbinectomy, septoplasty, and rhinoplasty are prior surgeries. Endoscopic sinus surgery was performed in 20 patients having asthma and chronic sinusitis. 85% of patients having endoscopic sinus surgery showed considerable improvement in asthmatic symptoms (39). Surgical treatment of the nasal polyposis is indicated when conservative treatment has no remarkable improvement in the symptoms. During the last three decades, there were different surgical methods. The term "Functional Endoscopic Sinus Surgery" ("FESS" or "FES") was first introduced by Kennedy and coworkers in 1985 (27). Functional endoscopic sinus surgery involves both, surgical technique and isthmus surgery. Rhino surgeon faced diffused polypoid growth in aspirin-intolerant patients. After Endoscopic sinus surgery, patients complain about the loss of smell. Functional endoscopic sinus surgery is a very important procedure to reduce nasal polyps. Recent research noted that after the endonasal sinus surgery there are many possible complications such as nasal bleeding, intracerebral injury or tearing of the carotid artery (40). Rhinosurgery majorly performed in those patients which are annoying to the conservative, medical (corticosteroid treatment) or for those patients who are allergic to the medical treatment (28). Recent research evaluated that nasal polyp's treatment with

either steroid or endonasal ethmoidectomy have significant improvement in the nasal symptoms. Endoscopic sinus surgery has significant improvement in total nasal resistance and opens the airway pathway medical treatment therapy are in priority now in these days.

Sinonasal polyps show the diffuse inflammatory process that has multiple causes. Medical treatment of the nasal polyps always primarily and are in priority in clinical practice. Medical treatment course may be oral or topical steroids in nature. Systemic corticosteroids reduce the rhinitis symptoms also improve the dispersion of the intranasal topical steroids and improves the sense of smell. Systemic corticosteroids treatment is also helpful during and after nasal surgery. After the polypectomy systemic corticosteroids stop the recurrence of the nasal polyps. Topical corticosteroids also reduce the nasal polyps' size and prevent the further growth of the nasal polyps after surgery. Both topical and systemic corticosteroids are used as a combination in severe cases. Nasal drops are most effective in distribution in all sides of the sinuses rather than the nasal spray. Nasal drops formulation is much better rather than the nasal spray

(10). There are different other medical therapies such as the use of leukotriene antagonists, but they need further study for their use. Surgery indicated in those patients who are allergic to the corticosteroids and phobic to the medication and refuse to take medication. Medical or corticosteroid treatment is more effective to treat the nasal polyps as reduced the polyp's size and open the airway path. Endoscopic sinus surgery is also helpful to treat the nasal polyps and reduce the polyps' size and nasal blockage. The overall study indicates that the nasal polyps are treated by medical therapy.

CONCLUSION

This study concludes that both surgical and medical treatments are effective in management of nasal polyps and depends upon the doctor's choice and patients current situations. Both treatments relieve the patients from severe facial pain, headache and post-nasal drops. But sometimes medical treatment has no satisfying results such as the recurrence of the nasal polyps in some cases. While on the other hand surgical treatment is the best choice for the removal of the complicated nasal polyps.

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