Original Article

Recurrence of Nasal Polyps After Functional Endoscopic Sinus Surgery

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Running Title: Recurrence of polyposis after surgery

Abstract

Background: Nasal polyps are a very common pathology of unknown etiology with a high rate of recurrence after surgery. As patients start treatment in different stages of disease, there are no data on the rate of polyp regrowth. The factors that influence regrowth are also unknown.

Objectives: To determine the rate of and reasons for polyp regrowth after functional endoscopic sinus surgery (FESS).

Methods: The study group included 148 of the 178 patients with polyposis nasi who underwent FESS in our institute over a one-year period and were closely followed for 4 to 5 years. All had failed pharmacologic therapy. No medical treatment was administered postoperatively. Infection and allergy were determined by histologic examination of the polyps, culture of nasal smears, and skin prick tests. Frequent endoscopic examinations were performed during follow-up. On detection of polyp regrowth, medical treatment was started according the patient’s condition.

Results: Polyp regrowth occurred in 74 patients in the first 2 years after surgery and in an additional 17 in the next 3–4 years, for a total of 91 patients (61.5%). There was no correlation between allergy, infection and recurrence of polyps.

Conclusions: Polyp regrowth occurs within the first two years postoperatively in half the patients with polyposis nasi. During the following years, the recurrence rate is lower. In our study, 61.5% of the patients had polyp regrowth during a 4-to-5 year follow-up. The reason for the recurrence remains unclear.

Key Words: nasal polyps, allergy, recurrent, FESS

Introduction

Nasal polyps are a very common pathology, but the etiology is unknown [1,2].
Some investigators believe they result from a chronic inflammatory process [3,4]; other factors may be involved as well [5,6]. It is often impossible for the clinician to determine the time of onset of initial polyp growth or the triggering mechanism. Treatment consists of corticosteroids, antihistamine, antibiotics, or surgical resection. Pharmacological agents are usually given postoperatively to prevent regrowth [5,6,7,8], though their necessity in all patients has not been clarified.

We conducted the present prospective survey to gain a better understanding of the mechanism of regrowth of nasal polyps. Specifically, we sought to determine the rate of and reasons for polyp regrowth after functional endoscopic sinus surgery (FESS) with repair of anatomical deformities. We also studied whether there is a correlation between regrowth of polyps and presence of infection and allergy.

**Material and Methods**

The Rabin Medical Center is located in central Israel and serves Tel Aviv and surrounding cities, with a population of more than two million. 178 patients with polyposis nasi underwent FESS following failure of medical treatment with corticosteroid nasal sprays, antihistamines and/or antibiotics. Of these, 148 were followed for 4 to 5 years. The study group included 54 women and 94 men (ratio 1:1.7) aged 22 to 69 years.

Prior to surgery all patients underwent a thorough physical examination, including nasal endoscopy, computed tomography of the nose and sinuses, and skin prick tests for common allergens (grass pollen, tree pollen, weed pollen, indoor allergens, and mold). Surgery was performed under local anesthesia and included thorough cleaning of the nose and ethmoids and repair of anatomical deformities (deviated nasal septum, concha bullosa, paradoxical concha, big agar nasi, etc.). Nasal smears were taken for culture, and all polyps were examined microscopically.

Postoperatively, patients were instructed to irrigate the nose with normal saline for ten days. No medical treatment was administered. Follow-up endoscopies were performed by two of the authors every 6 weeks in the first postoperative year, every 12 weeks in the second year, and every 6 months during the subsequent years. On detection of polyp regrowth, medical treatment was started according to the individual findings.

**Statistical Analysis**

The regrowth rate of polyps was calculated by the Kaplan-Meier method. The correlation between positive allergic histology and positive skin prick test was calculated by chi-square ($\chi^2$) test.

**Rezultate**

Of the 178 patients who underwent FESS because of nasal polyps, 148 were closely followed for 4 to 5 years; 45 of them had asthma.

**Regrowth of polyps**

We defined regrowth as the appearance of any polyp, even a small one, inside the open ethmoid of the middle meatus. Regrowth occurred in 32 patients (20 male, 12 female, 20.9%) in the first postoperative year and in 42 patients (28 male, 14 female, 28.4%) in the second year. Five additional patients (3 male, 2 female) began to show regrowth in the third year, 6 in the fourth year, and 6 in the fifth year. The overall recurrence rate (91 patients) was 61.5%, with a female: male ratio of 1:1.8. The recurrence rate for the asthmatic patients was higher (31 out of 45) than for the non-asthmatic patients (Table I, Figure 1).

**Allergy**

Positive skin tests for allergy (grass pollen, tree pollen, weed pollen, indoor allergens, and molds) were found in 86 patients (58%). Histologic study showed allergic predominance (pronounced presence of eosinophils and mast cells) in 55 patients (37%), and allergy and infection in 47 (32%). Eighty-four of those with positive skin tests had allergic features on histology (Table II). The correlation
between the histologic and skin test findings was highly significant (p<0.001; Table III). Polyp regrowth was not more frequent in the allergic patients.

**Infection**

Positive cultures for pathogenic bacteria were found in 38 patients (26%). Histologic examination showed a predominance of infection (mixture of neutrophils, lymphocytes and plasma cells) in 35 patients (24%). As mentioned above, 47 patients (32%) had infection and allergy. There was much more histologic than bacteriologic evidence of infection. Infection was not associated with polyp regrowth.

Negative histologic findings for both allergy and infection were noted in 10 patients (7%).

**Discussion**

It is well documented that nasal polyps tend to regrow after surgery [9,10,11,12]. The recurrence rate with postoperative corticosteroid nasal spray treatment ranges from 10 to 64%. Virolainen and Puhakka [13] have investigated the postoperative recurrence rate after surgery; they reported one-year rates of 87% with placebo compared to 46% with beclomethasone nasal spray. In our study, polyps recurred in 20.9% of the patients within the first year and 61.5% within 5 years. Considering that nasal polyps may originate in the middle meatus, the lateral wall of the middle turbinate, and the anterior and posterior ethmoid sinuses [12,14,15], we examined the nose endoscopically to ensure that follow-up was started with no polyps at all, and we defined regrowth as any polyp, even in the ethmoid cavity or the middle meatus. We also repaired anatomical deformities to allow clear airway passage and opened the ostia of the maxillary and frontal sinuses to prevent sinusitis. We believe our good results may be attributed to these procedures.

Nevertheless, a recurrence rate of 61.5% in 5 years is quite high, indicating that surgery may not be the preferred treatment for nasal polyps [16,17]. Other authors have suggested that corticosteroid nasal spray is the treatment of choice [18,19,20]. However, all of our patients had been treated medically without success prior to surgery.

We found no correlation between positive findings on skin tests for allergy or histological allergy study and recurrence rates. We also found no correlation between a finding of infection during surgery and recurrence rates. The reason for the regrowth of the polyps remains unclear.