

# A review of nasal polyposis and surgical management

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## Abstract

*Nasal polyps are common, affecting up to four percent of the population. Their etiology remains unclear, but they are known to have associations with allergy, asthma, infection, cystic fibrosis, and aspirin sensitivity. Computerized tomography allows evaluation of the extent of the disease and is essential when surgical treatment is to be considered. There is good evidence for the use of corticosteroids (systemic and topical) both as primary treatment and as postoperative prophylaxis against recurrence. Surgical treatment has been refined significantly over the past twenty years with the advent of endoscopic sinus surgery. Symptomatic improvement is more in Endoscopic sinus surgery (ESS) compared to conventional procedures (including polypectomy, Caldwell-Luc and intranasal ethmoidectomy). Overall complications following ESS are relatively very few polyp recurrence are also less (8%) for ESS compared with 14% for conventional surgery.*

**Keywords:** Nasal polyposis, surgical procedures, FESS

## Introduction

Nasal polyposis are benign lesions, round, soft, semi-translucent, pale or yellow glistening structures that originate from any part of the nasal mucosa or paranasal sinuses (although most commonly from the ethmoid or middle meatus regions)<sup>1</sup>.

Nasal Polyposis have uncertain etiology and may be linked to chronic inflammation, allergy, autonomic nervous system dysfunction and genetic predisposition.<sup>2</sup>

Functional endoscopic sinus surgery (FESS) is a minimally invasive technique that uses an endoscope to improve ventilation and drainage in addition to polyp removal<sup>1,3</sup>.

The extent of surgery varies according to the extent of disease and surgeon's individual practice. This technique has been used for more than a decade in treating sino-nasal conditions. Advantages are claimed over conventional surgery: permitting a better view of the surgical field, a more precise and thorough clearance of the inflammatory change, fewer complications and lower recurrence rate<sup>14</sup>.

## Objectives

To provide a systematic review of the clinical effectiveness of endoscopic sinus surgery (ESS) for the removal of nasal polyps.

## Methods

A systematic review of the literature was undertaken. Searches of electronic databases, websites and reference lists were made to identify relevant studies. Comparative studies were included if they were primary research, focused on FESS for the removal of nasal polyps, reported patient relevant outcomes and were published in English. In addition, case series studies were included if they met the above criteria and enrolled more than 50 patient with polyps.

Twenty-three studies were included in the review article. Etiology, prevalence, clinical features, investigations and treatment of Nasal Polyps are discussed in reference to different authors. Mostly surgical management were discussed in details and medical management also discussed in brief.

## Etiology of nasal polyposis

The etiology of NP is unknown. Some theories consider polyps a consequence of conditions which cause chronic inflammation in the nose and nasal sinuses characterized by stromal edema and variable cellular infiltrate.<sup>5</sup> Studies provide little evidence to support the relationship of allergy with NP found in only 1%-2% of patients with positive skin prick tests.<sup>6</sup>

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In addition, studies have shown that NP are no more common in atopic individuals.<sup>7</sup>

An association between polyposis and fungal cultures has been established for many years.<sup>8</sup>

There is some evidence for a genetic element to NP. A link has been demonstrated recently between HLA-A74 and NP<sup>9</sup> (Luxemburger et al 2000), but the current knowledge in this area remains very limited.

Medical conditions commonly associated with polyps include asthma, bronchiectasis, and cystic fibrosis.<sup>10</sup>

### Prevalence

In the general population, the prevalence of NP is considered to be around 4%.<sup>11</sup> They predominantly affect adults and usually present in patients older than 20. They are uncommon in children under 10 and may be the presenting feature of cystic fibrosis. There is a 2:1 male to female preponderance<sup>11</sup>.

Up to a third of NP patients have asthma, whereas polyps are only found in 7% of asthmatics<sup>10</sup>.

### Clinical features

The main presenting symptom of NP is nasal obstruction which is constant but can vary depending on the site and size of the polyps. Sufferers will also frequently complain of watery rhinorrhea and postnasal drip. Anosmia or hyposmia with an ensuing alteration in taste are also characteristic symptoms of NP.<sup>11</sup>

NP are almost invariably bilateral and when unilateral require histological examination to exclude malignancy or other pathology such as inverted papilloma<sup>11</sup>.

### Investigations

Plain X-rays are insensitive and of no value in the diagnosis of NP but they may show opacification of the affected.

Sinuses<sup>12</sup>. A CT scan will show the extent of NP and anatomical variations and is essential if surgical treatment is to be implemented<sup>13</sup>. In unilateral cases of NP, an magnetic resonance imaging scan may aid diagnosis, particularly for investigations of more serious conditions such as neoplasia<sup>14</sup>.

### Treatment of NP

Therapy for NP involves a combination of observation, medical, and surgical treatments depending on individual case assessment.

### Medical treatment

The advent of topically administered corticosteroids has improved the treatment of upper (NP and rhinitis) and lower (asthma, chronic obstructive airways disease) airway disease<sup>15</sup>. Both topical and systemic glucocorticoids may affect the eosinophil function by both directly reducing eosinophil viability and function or indirectly reducing the secretion of chemotactic cytokines by nasal mucosa and polyp epithelial cells<sup>16</sup>.

Systemic steroids are reserved for advanced or refractory cases particularly when allergy is present. Leukotriene receptor antagonists have recently been shown to be effective<sup>17</sup>, but larger scale trials are required to prove their efficacy.

Allergic fungal rhinosinusitis is treated by both topical and systemic antimycotics as an adjunct to sinus surgery. Surgery is considered the first-line therapy particularly for invasive fungal rhinosinusitis<sup>18</sup>.

### Surgical treatment

No single surgical technique has proved to be entirely curative and patients often undergo repeated procedures despite receiving long-term medical therapy. Recurrence is common in severe disease, rate is 5–10%<sup>15</sup>.

Surgical techniques have been significantly refined over the past 20 years with the advent of endoscopic sinus surgery.

(ESS)<sup>4</sup>. With a better understanding of the anatomy of the osteomeatal complex and pathways of mucociliary clearance, ESS is now the mainstay of treatment for NP.

In the UK, National Health Service Research and Development Health Technology Assessment Programme Evaluation, polyp recurrence was 28% following endoscopic sinus surgery compared with 35% following intranasal polypectomy.<sup>01</sup>

Many surgeons continue to perform simple avulsion polypectomy with good results<sup>19</sup>. ESS involves restoring sinus drainage by careful removal of NP or other soft tissue obstructing the natural sinus ostia<sup>2</sup>. The increasingly more common technique of micro-debridement, which involves a rotating blade in combination with suction and irrigation. There is some research available that radical endoscopic sinus procedures involving complete fronto-spheno-

idectomies lead to greater perceived benefits<sup>21</sup>. More extensive surgery can lead to increased risk of operative complications but to date no comparative study exists between radical and limited surgery.

There is little doubt that ESS offers better visualization and scope for precision surgery. The micro-debrider<sup>22</sup> (kirtane) in particular enables accurate removal of NP whilst preserving normal anatomical structures such as the turbinates.

Serious complications of ESS are rare but the patient must be counseled preoperatively about the potential risks such as loss of vision, damage to the internal carotid artery, and cerebrospinal fluid leakage after inadvertent trauma to the skull base<sup>23</sup>. It is important postoperatively to regularly douche the nasal cavity with saline to prevent crusting and adhesions.

Topical intranasal steroids are also a routine part of aftersurgery care to prevent recurrence significantly better in different studies, controlled symptomatic improvement that ranged from 78 to 88% for FESS compared trials reported overall symptomatic improvement that ranged from 78 to 88% for FESS compared with 43 to 84% for conventional techniques (including polypectomy, Caldwell-Luc and intranasal ethmoidectomy)<sup>01,23</sup>.

Disease recurrence was 8% for FESS compared with 14% for Caldwell-Luc and polyp recurrence was 28% for endoscopic ethmoidectomy compared with 35% for polypectomy<sup>1,21, 23</sup>.

Revision surgery was reported in one study only and was the same for FESS and Caldwell-Luc procedures. Percentage of overall complications was reported in only one study and was 1.4% for FESS compared with 0.8% for conventional procedures<sup>1,4,22,23</sup> Total complications in the case series ranged from 22.4 to 0.3%.<sup>1,23</sup>

### Conclusions

We have identified large amounts of data on FESS. The majority of studies report that people's symptoms improvement following FESS has been satisfactory; however, the improvement magnitude was lower than what has been expected. Complications following FESS were relatively very few; however, only a small proportion of evidence is comparative.

FESS may offer some advantages in effectiveness over comparative techniques, but there is enormous

variation in the results reported and there are methodological limitations. There is a clear need for quality-controlled trials in order to answer questions regarding the effectiveness of FESS.

Fortunately, advantages in the understanding of sinus anatomy and changes with polyposis, along with many available technological advancements, combine to make surgery safer, efficient, and more complete than in the past.

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