

AMERICAN ACADEMY OF OTOLARYNGOLOGY—
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GERIATRIC CARE OTOLARYNGOLOGY



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Chapter 6

Rhinosinusitis

Surgical Management of Chronic Rhinosinusitis in the Geriatric Patient

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As our population ages and continued advances in medicine occur, more and more of our patients are moving into the senior age range defined as 65 years of age or older. These people are increasingly susceptible to common respiratory tract infections. The U.S. population has grown by 39 percent in the past 30 years, but the segment older than 65 years has grown by 89 percent and the segment older than 85 years by 232 percent. It is estimated that, by the year 2030, 70 million people will be older than 65 years of age, and comprise approximately 20 percent of the U.S. population.¹

Questions about Aging and Health

1. Does immune status decrease with age?

The immune system undergoes continuous changes throughout life, with a decline of cell and antibody-mediated immune responses with age.² This process is well documented and called immunosenescence. Some evidence in a recent study of healthy centenarians suggests that the immunologic changes observed during aging

are consistent with a reshaping, rather than a generalized deterioration, of the main immune functions.³ The consequences of impaired immune function in the elderly include increased susceptibility to infectious diseases as well as an extended post-illness recovery period.⁴

2. Do respiratory tract infections increase with age?

As people age, they become more susceptible to infections. Infection is a common cause of illness in old age and the fourth most frequent cause of death.⁵ Increasing frequency of infections in the elderly has commonly been attributed to a decrease in their immune status and to nonspecific host factors, alterations in the skin and mucosal barriers, as well as nutritional factors and underlying chronic diseases.⁶ Some T-cell functions decrease with age while others fail to respond to new antigen challenges. Humoral function appears to be affected by an increase in IgG and IgA and variable changes in IgM levels. A sluggish T-helper cell response along with B-cell defects may explain why the elderly do not have as vigorous response to immunization with vaccines.⁷

Skin changes associated with aging include poorer hydration and loss of depth of the rete pegs, increasing the likelihood of shearing damage to the epidermis. Impairment of mucociliary clearance with aging also contributes to increased risk of respiratory infections.

3. What other co-morbidities are associated with aging?

Malnutrition: Malnutrition frequently occurs in the elderly. Specifically, depletion of muscle mass (sarcopenia) is responsible for the frailty of the elderly. Not only does reduction in muscle mass affect mobility, it results in a diminished capacity for responding to the increase in protein synthesis necessary for fighting disease and infection.⁸ Protein-energy malnutrition impairs several aspects of the immune system, including cell-mediated immunity, ability of phagocytes to kill ingested bacteria and fungi, several components of the complement system, mucosal secretory IgA antibodies, and the affinity of antibodies.⁹

Studies demonstrate that even a modest increase in dietary supplements can improve the immune response. Administration of zinc sulfate to patients over 70 years of age for one month increased the number of circulating T cells, delayed cutaneous hypersensitivity to certain purified protein derivatives, and improved serum IgG antibody response to tetanus toxoid.¹⁰ Vitamin C supplementation for a similar time period in the elderly enhanced lymphocyte proliferation responses in vitro and skin reactivity to tuberculin in vivo.¹¹ Nutritional support is essential in this patient population and should be paramount in the primary care physician's health care plans.

Restricted lifestyle: Few studies have actually studied the role of lifestyle as it affects the immune response in the elderly. Tsukamoto and colleagues investigated the role of lifestyle and neutrophil functions in the elderly.¹² They concluded that stress-coping activities and relationships (for example, hobbies, pets, and close family relationships)

were a positive influence and play a role in the balance between phagocytosis and subsequent superoxide production, which can improve neutrophil function. Total serum protein levels were also noted to play an important role in prevention of infections in this population.

Chronic Rhinosinusitis

Epidemiology

Chronic rhinosinusitis (CRS) is currently the most common chronic ailment in the United States. (134.4 cases per 1,000 Americans), accounting for 35 million cases and 11.9 million patient visits a year. Risk factors for development of CRS include allergy, paranasal anatomic anomalies,¹³ compromised immune status, and mucociliary dysfunction.

Up to one-third of patients with chronic rhinosinusitis have associated asthma. Although the prevalence of asthma in the elderly is similar to younger adults, the morbidity and mortality are greater in older patients. The death rate due to asthma is 14 times higher for those 65 and older. Symptoms of asthma in the elderly appear to be more consistent, with less mild symptoms and symptom-free periods.¹⁴ There was also a higher prevalence of reported allergy (62 percent), Chronic Obstructive Pulmonary Disease (COPD), and sinusitis in these asthmatics.

Pathophysiology

The inciting stage for the development of CRS typically comes from either viral or allergic inflammation. Allergic rhinitis causes an increase in mucus production and a decrease in mucociliary function and nasal mucous membrane. If ostial obstruction develops, a secondary bacterial infection may ensue. With persistent obstruction, poor aeration results in oxygen resorption in the sinus cavity and carbon dioxide accumulation. Further changes in the sinus membranes occur with mucous membrane fibrosis and ciliary injury resulting from the persistent ostial obstruction, which, if persistent, becomes chronic rhinosinusitis.

Signs and symptoms of CRS can be very subtle and result in chronic postnasal drainage, nasal congestion, and a chronic cough. A dull, aching pain or sinus headache may be present as well. The diagnosis is confirmed with a non-contrast CT of the sinuses.

Cognitive function may also be impaired in the elderly with chronic rhinosinusitis. One study reported subtle changes in cognitive function in elderly patients with CRS compared with age-matched controls using the Mini-Mental State Examination.¹⁵ The researchers found either a decrease in the power of concentration in these patients or an effect on specific cognitive functions. They recommended early medical intervention for neglected CRS to sustain cognitive function in the elderly. Medical treatment is aimed at reducing intranasal inflammation, promoting drainage, and treating the underlying

bacterial infection. Medications include but are not limited to a combination of nasal steroids, decongestants, long-term antibiotics (three-plus weeks), and mucolytic agents. Oral steroids have been advocated in some cases as well.

Surgical Options

Failure of medical therapy for the symptomatic patient with radiologic evidence of chronic sinus disease is the main indication for sinus surgery. By understanding the pathophysiology, limited mucosal-sparing surgery may be performed using endoscopic techniques to remove disease at the ostiomeatal complex, an area along the lateral nasal wall where there is a confluence of sinuses. This technique, first introduced by Messerklinger in 1978 and known as functional endoscopic sinus surgery (FESS),¹⁶ is relatively safe in the hands of a properly trained otolaryngologist.¹⁷ FESS has become the procedure of choice for the surgical management of chronic rhinosinusitis.

Surgical assessment of the elderly is far more critical than in the younger, healthier patient. The goal of a preoperative assessment is to identify and determine surgical or anesthesia risk factors and to assist in the management of those recognized problems before and after surgery.¹⁸ As with any operation, the benefits must outweigh the risks. Chronic rhinosinusitis is not a life-threatening disease but often significantly affects the quality of life of our patients.

Outcomes

Patients with upper respiratory tract infections have measurable, significant decrements in health-related quality of life.¹⁹ A positive impact on symptoms and quality of life in the majority of patients undergoing functional endoscopic sinus surgery for CRS has been established.²⁰

Many published studies have demonstrated improvement in symptom scores and quality of life following functional endoscopic sinus surgery for chronic rhinosinusitis.²¹ Most studies report success rates ranging from 76–95 percent in adults.²² Complication rates also vary from 2–35 percent, and are directly dependent on the experience and expertise of the surgeon.²³ Unfortunately, most studies lack the methodology of the gold standard research protocol: randomized, double-blind placebo control.

In 2001, Lund published an excellent review of 24 ESS studies through 1998 and explained eloquently most of the studies’ shortcomings.²⁴ Fortunately, several studies using outcome measures (level 2 evidence) have confirmed success utilizing FESS. Durr performed a longitudinal study on 51 patients undergoing FESS for recurrent acute rhinosinusitis, chronic rhinosinusitis, and nasal polypsis.²⁵ Patients were evaluated preoperatively and three months postoperatively with a disease-specific health status questionnaire (Rhinosinusitis Outcome Measure) and a general health status questionnaire (Medical Outcome Study 36-Item Short-Form Health Survey). Their short-

term results showed statistically significant improvement in quality of life after endoscopic sinus surgery in both the disease-specific and the disease-generic health status questionnaires.

Finally, Lieu and Piccirillo reviewed 518 FESS studies through 2001 looking specifically at methodology to determine efficacy of FESS.²⁶ Of those published studies, only 35 met their stringent criteria for further assessment of methodological criteria. Taking the limitations of most of the studies into account, patient improvement following FESS ranged from 68.9 percent (good outcome) to 94 percent (at least 50 percent improvement).

Performing a Medline search revealed only one article in the medical literature specifically addressing endoscopic sinus surgery in the geriatric population. Ramadan and VanMetre retrospectively reviewed their experience with FESS over an 11-year period.²⁷ Of the 568 cases studied, 8.1 percent (46 patients) were older than 65 years of age. In evaluating their results, Ramadan found complication rates similar to the younger adults. However, in those elderly patients undergoing revision sinus surgery (N=11), the complication rate was significantly higher and related to breach of the lamina papyracea with herniation of orbital fat (27 percent versus 8 percent), hemorrhage (18 percent versus 3.4 percent), or periorbital ecchymosis (9 percent versus 1 percent).

A new, validated, 10-question, health-related, quality-of-life instrument (Rhinosinusitis Quality of Life Survey—Rhino QoL) for patients with sinusitis is now available and should make outcome studies easier to perform.²⁸

In sum, chronic rhinosinusitis is a common and often debilitating disease that frequently requires surgical management after failure of medical therapy. With the increasing age of our population, more elderly patients will require some form of surgical management for CRS. Clinical experience and outcome measures show high success rates for FESS. Careful attention to co-morbid factors and proper preoperative assessment and planning should allow for successful management of these patients. Future studies are necessary to thoroughly evaluate this patient population.



Quiz

1. Which of the following do not affect the risk of infection in the elderly?

- a. immunosenescence
- b. sarcopenia
- c. nutritional imbalance
- d. lifestyle
- e. none of the above

2. The medical management of chronic rhinosinusitis does not usually include

- a. decongestants
- b. nasal steroid sprays
- c. antihistamines
- d. antibiotics
- e. mucolytic agents

3. Evidence for efficacy of FESS in the management of CRS is currently best shown by

- a. reviews of retrospective studies.
- b. randomized, double-blind, placebo-controlled study.
- c. expert opinion.
- d. outcome studies.
- e. none of the above.

Answers:

- 1. e
- 2. c
- 3. d

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Additional Resources

- 1. Surgery of the Paranasal Sinuses—AAO-HNS Monograph
- 2. Endoscopic Sinus Surgery—AAO-HNS SIPAC

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