21st century rhinology

Twenty-first century rhinology encompasses both medical and surgical treatments of a wide range of diseases and conditions of the nose, paranasal sinuses, and adjacent structures. Now under the leadership of coeditors Rakesh Chandra, M.D., and Raj Sindwani, M.D., as well as Deputy Editor of Allergy Anju Peters, M.D., the American Journal of Rhinology and Allergy, as a leading otorhinolaryngology journal, captures the breadth of the field in articles submitted by authors from across the entire world.

BASIC SCIENCE

Although a role for the use of doxycycline has emerged in the treatment of chronic rhinosinusitis, the mechanisms for the antibiotic’s anti-inflammatory effects are poorly understood. Shin et al.1 examined the effect of doxycycline in an in vitro model of A549 and nasal epithelial cells. They showed that doxycycline inhibited TGF β1–induced migration as well as the epithelial to mesenchymal transition.

Cigarette smoke adversely impacts sinonasal mucosal function (consistent with its adverse health impacts throughout the body) through various mechanisms. Shin et al.2 used an in vitro model to examine the impact of cigarette smoke extract (CSE) on nasal fibroblasts. They demonstrated that CSE stimulates VEGF expression through its apparent downregulation of TLR4 transcription. Interesting, pretreatment with reactive oxygen species reduced CSE-initiated VEGF expression. The T2R38 bitter taste receptor has a role in innate immunity mechanisms through nitric oxide production. Yan et al.,3 built on this work and established that both T2R4 and T2R16, two additional bitter taste receptors, were expressed in cilia of human epithelial cells and triggered nitric oxide production.

MEDICAL TREATMENT OF SINONASAL INFLAMMATORY CONDITIONS

The advent of monoclonal antibody therapy has changed the treatment paradigm for the specialty of rhumatology, in which many treatments now specifically target mechanisms of autoimmune diseases. That approach has not been widely adopted in the treatment of chronic rhinosinusitis, but several monoclonal antibodies, including omalizumab, dupilumab, mepolizumab, and reslizumab, are emerging as therapeutic alternatives to conventional therapies of corticosteroids and even surgery. In this issue, Chiarella et al.,4 presented a comprehensive review of clinical trials of these agents for the treatment of specific chronic rhinosinusitis subtypes.

Lin5 compared normal saline solution nasal-pharyngeal irrigation and iluticasone propionate nasal spray (FPNS) treatments in patients with allergic rhinitis due to house-dust mite. Cough, as measured by the Leicester Cough Questionnaire and the cough response to capsaicin, was improved among patients treated with normal saline solution nasal-pharyngeal irrigation but not with FPNS. However, visual analog scores of allergic rhinitis symptoms and mediators (histamine, leukotriene C4, prostaglandin D2, and major basic protein) from nasal lavage fluid were reduced more in the FPNS group.

Surgical treatment of sinonasal diseases

The prevalence of respiratory viruses in the paranasal sinuses of patients with cystic fibrosis (CF) was examined by Rowan et al.,6 who used commercially available respiratory viral screens in a study of 24 patients with CF and 14 healthy controls. Respiratory virus was detected in 33% of patients with CF and 0% of controls, respiratory virus was only detected during the winter months, and the presence of respiratory virus was not associated with differences in the SNOT-22 scores or the modified Lund-Kennedy scores.

Office-based rhinologic procedures are increasingly common, but reports of case series in the literature are relatively sparse. Scott et al.,7 described a single institution’s experience with office-based rhinologic procedures in a case series of 315 patients who underwent 166 turbinoplasty, 118 ESS, 35 septoplasty, 34 rhinoplasty, and 4 septo-rhinoplasty surgeries. They concluded that the office-based procedures were safe, with a low rate of revision procedures.

Skull base

Although minimally invasive pituitary surgery (MIPS) has emerged as the preferred modality for surgical treatment of pituitary pathology, optimal strategies for managing the postoperative cavity have not been determined. Chaudhry et al.,8 reported SNOT-22 scores and endoscopic data for 52 patients after MIPS. Scores on the SNOT-22 rhinologic domain worsened for the first 2 weeks after surgery and then improved back to baseline. Endoscopy scores showed a similar trend for up to 16 weeks after surgery. This lag highlighted the importance of serial endoscopy in the postoperative period to optimize long-term outcomes after MIPS.

Over the past 25 years, numerous materials have been proposed for the repair of skull base defects. Al-Asoussi et al.,9 described the use of a polydioxanone plate in five patients who underwent skull base repair for tumor resection and two patients who underwent skull base repair for CSF rhinorrhea. This initial report highlighted a single center’s preliminary experience with a resorbable but rigid implant for skull base reconstruction. Although the reported success rates for endoscopic CSF leak diagnosis and repair were quite good, certain characteristics of a skull base defect may make such diagnosis and repair more challenging. Loftus et al.,10 described the radiologic find-
of an “excavating/canal-like skull base defect,” which they associated with difficulty in localizing the CSF leak as well as early recurrence after repair.

Omura et al.\textsuperscript{12} presented a video report on the trans-septal access with crossing multiple incisions, a method for both tumor transposition and pedicle visualization during endoscopic resection of unilateral sinonasal lesions.

At many institutions, rhinologic surgeons are called to manage unusual instances of skull base trauma. Ghadersohi et al.\textsuperscript{13} performed a systematic review of penetrating skull base injuries from the surgical rhinology perspective. In this review, fewer than half of the cases were managed under endoscopic visualization or with endoscopic assistance. Secondary morbidity was quite noteworthy, which thus highlighted the need for thorough and timely interdisciplinary management.

FUTURE WORK

Any reader of this month’s \textit{American Journal of Rhinology and Allergy} issue will be impressed by the quality and breadth of the articles. The authors should be congratulated for their contributions to rhinology. These efforts will improve the clinical care provided to today’s patients as well as future patients.

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