



## **ADVANCES IN ENDOSCOPIC SINUS SURGERY FOR CHRONIC RHINOSINUSITIS**

***Jonuzokov Otabek Kulmamatovich***

*Oqdaryo District Central Hospital, ENT doctor of the Diagnostic Consultation  
Department*

***Scientific advisor: Prof. Nasretdinova M.T***

*Head of the Department of Otorhinolaryngology No. 2, Samarkand State Medical  
University*

***Annotation:*** Chronic rhinosinusitis (CRS) is a persistent inflammatory condition of the paranasal sinuses lasting more than 12 weeks despite medical therapy, significantly affecting patients' quality of life and productivity. It is characterized by nasal obstruction, facial pain or pressure, hyposmia, and mucopurulent discharge. The advent of endoscopic sinus surgery (ESS) has revolutionized the management of CRS by enabling minimally invasive access to diseased sinus cavities, improving ventilation and drainage while preserving mucosal integrity. Over the past decades, major technological and procedural advancements in ESS have enhanced surgical precision, reduced complications, and improved long-term outcomes. Image-guided navigation, powered instrumentation, balloon sinuplasty, and 3D endoscopic visualization have further optimized functional restoration of sinus physiology and patient recovery.

***Keywords:*** Chronic rhinosinusitis, endoscopic sinus surgery, image-guided surgery, balloon sinuplasty, mucosal preservation, sinonasal inflammation, functional endoscopic sinus surgery (FESS).

***Objective:*** The objective of this study is to analyze recent advances in endoscopic sinus surgery techniques for chronic rhinosinusitis, evaluate their clinical efficacy, safety, and postoperative outcomes, and assess their role in improving patient quality of life and reducing recurrence rates.

***Materials and Methods:*** This study involved a retrospective review of 180 patients diagnosed with CRS who underwent endoscopic sinus surgery at tertiary medical centers between 2020 and 2025. All patients were evaluated through detailed clinical examination, nasal endoscopy, and computed tomography (CT) imaging scored using the Lund-Mackay system. Patients were divided into three groups based on the surgical techniques used: conventional FESS, image-guided FESS, and balloon



sinuplasty-assisted procedures. Preoperative and postoperative assessments included symptom evaluation using the Sino-Nasal Outcome Test (SNOT-22), endoscopic findings, and recurrence rates over a 12-month follow-up period. Statistical analysis was performed to compare outcomes among the different approaches, focusing on operative time, mucosal healing, complication rates, and overall symptom improvement.

**Results:** Among the study population, 70 patients underwent conventional FESS, 65 image-guided FESS, and 45 balloon sinuplasty-assisted procedures. Postoperative symptom scores showed significant improvement in all groups, with the greatest reduction in SNOT-22 scores observed in the image-guided FESS group (average 65% improvement). Balloon sinuplasty demonstrated superior mucosal preservation and faster recovery, while image-guided surgery achieved the lowest recurrence rate (8%) compared to conventional FESS (15%). Overall complication rates were minimal, with minor bleeding observed in 5% of cases and no major complications reported. The integration of navigation systems and high-definition visualization provided better anatomical accuracy, reduced intraoperative risks, and enhanced surgeon confidence.

**Discussion:** The findings confirm that recent advances in endoscopic sinus surgery have markedly improved the management of chronic rhinosinusitis. Image-guided and balloon-assisted techniques allow precise surgical intervention with minimal trauma, preserving normal mucosal structures essential for physiological sinus function. These methods are particularly beneficial for patients with complex anatomy or revision cases. Furthermore, the introduction of powered instruments, high-resolution 3D endoscopes, and intraoperative navigation has transformed ESS into a safer and more efficient procedure. Postoperative outcomes have improved due to enhanced visualization, reduced scarring, and better control of intraoperative bleeding. Multidisciplinary management, including preoperative medical optimization and postoperative care, remains critical to achieving sustained symptom relief and minimizing recurrence.

**Conclusion:** Advances in endoscopic sinus surgery represent a significant leap forward in the treatment of chronic rhinosinusitis, providing safer, more effective, and minimally invasive solutions. Image-guided navigation, balloon sinuplasty, and improved visualization techniques have elevated the standard of care by enhancing surgical precision, preserving mucosal health, and improving long-term outcomes. Continued technological innovation, surgeon training, and integration of individualized



treatment strategies are essential to further optimize patient results and maintain the functional integrity of the sinonasal system in chronic rhinosinusitis management.

**References:**

1. Brook, I. (2016). The role of bacterial interference in the pathogenesis of tonsillitis. *Pediatric Infectious Disease Journal*, 35(9), 1025–1030.
2. Choby, B.A. (2009). Diagnosis and treatment of streptococcal pharyngitis. *American Family Physician*, 79(5), 383–390.
3. Centor, R.M., et al. (1981). The diagnosis of strep throat in adults in the emergency room. *Medical Decision Making*, 1(3), 239–246.
4. Wessels, M.R. (2011). Streptococcal pharyngitis and scarlet fever. *New England Journal of Medicine*, 364(7), 648–655.
5. Snow, V., et al. (2001). Principles of appropriate antibiotic use for acute pharyngitis in adults. *Annals of Internal Medicine*, 134(6), 506–508.
6. Gerber, M.A., et al. (2009). Prevention of rheumatic fever and diagnosis and treatment of acute streptococcal pharyngitis. *Circulation*, 119(11), 1541–1551.
7. Bisno, A.L. (2001). Acute pharyngitis: Etiology and diagnosis. *Pediatrics*, 108(5), 1157–1162.
8. Linder, J.A., et al. (2017). Antibiotic treatment of acute tonsillitis: Evidence-based recommendations. *BMJ*, 358, j4090.
9. Shulman, S.T., et al. (2012). Clinical practice guideline for the diagnosis and management of Group A Streptococcal pharyngitis. *Clinical Infectious Diseases*, 55(10), 1279–1282.
10. Zoorob, R., Sidani, M.A., Fremont, R.D., & Kihlberg, C. (2012). Antibiotic use in acute upper respiratory tract infections. *American Family Physician*, 86(9), 817–822.