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INCREASING THE EFFECTIVENESS OF COMPREHENSIVE DIAGNOSIS AND TREATMENT OF PATIENTS WITH CHRONIC RHINOSINUSITIS IN THE CONTEXT OF COVID-19.

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Abstract: The COVID-19 pandemic has significantly complicated the diagnosis and management of chronic rhinosinusitis (CRS), highlighting the need for a comprehensive, multidisciplinary approach. This review emphasizes current strategies to enhance diagnostic accuracy and treatment efficacy for CRS patients during and after the pandemic. It explores the influence of SARS-CoV-2 on sinonasal pathology, discusses innovative diagnostic tools, and reviews tailored therapeutic options, including conservative management and surgical interventions. Addressing challenges posed by COVID-19 is vital for improving patient outcomes, reducing recurrences, and optimizing healthcare resource utilization. The review synthesizes recent scientific evidence to guide clinicians in delivering effective, individualized care in this evolving landscape.

Keywords. chronic rhinosinusitis, COVID-19, sinonasal diagnosis, comprehensive management, multimodal imaging, endoscopic procedures, medical therapy, SARS-CoV-2, immune response.

Introduction.

The outbreak of Coronavirus Disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has revolutionized numerous facets of healthcare, especially in the diagnosis and treatment of ENT (ear, nose, throat) conditions. Among these, chronic rhinosinusitis (CRS) remains a prevalent and complex inflammatory disease, impacting approximately 5-12% of the global population, with substantial implications for quality of life, productivity, and healthcare costs. The pandemic posed unique challenges:

1. **Alterations in sinonasal physiology**: SARS-CoV-2 primarily affects the upper respiratory tract, including the sinonasal mucosa, which modulates local immune responses and barrier function. The virus's affinity for ACE2 receptors expressed on nasal epithelial cells influences disease course and complicates diagnosis.

2. **Overlap of symptoms**: Many COVID-19 patients experience nasal congestion, rhinorrhea, and anosmia—symptoms resembling CRS—leading to diagnostic dilemmas. Differentiating between viral-induced symptoms and underlying CRS is critical for proper management.

3. **Risk of aerosol-generating procedures**: Endoscopic sinus surgeries are high-risk for viral transmission, necessitating revised protocols that emphasize safety without compromising diagnostic or therapeutic goals.

4. **Impact on diagnostic algorithms**: The pandemic imposed restrictions on clinical visits and procedures, limiting in-person examinations and access to imaging, thereby demanding more reliance on telemedicine and novel diagnostic tools.

Given these challenges, the focus has shifted toward developing comprehensive, multimodal diagnostic algorithms that combine clinical evaluation, laboratory tests, imaging, and molecular diagnostics to accurately assess CRS in COVID-19 contexts. Additionally, tailored treatment strategies integrating pharmacological management, minimally invasive procedures, and surgical interventions have been refined to ensure effective care while minimizing infection risk.

The Role of SARS-CoV-2 in Sinus Pathology

SARS-CoV-2 infects sinonasal epithelial cells, causing inflammation, edema, and sometimes secondary bacterial infection. The virus induces a dysregulated immune response, leading to persistent mucosal inflammation, which may exacerbate pre-existing CRS conditions. Numerous studies have observed that individuals with CRS may experience a more severe or prolonged course of COVID-19, with some reports suggesting that chronic sinonasal inflammation could be a risk factor for virus persistence or increased susceptibility.

Diagnostic Innovations and Strategies

Traditional CRS diagnosis relies heavily on patient history, physical examination, nasal endoscopy, and imaging studies such as computed tomography (CT). However, during the pandemic, clinicians adapted by utilizing telemedicine consultations, symptom diaries, and remote assessment tools. Emerging technologies such as tele-endoscopy, digital otolaryngology platforms, and portable imaging devices have proven instrumental.

Molecular diagnostics, including PCR and rapid antigen tests for COVID-19, are integral in evaluating patients presenting with CRS symptoms amid the pandemic. Differentiating viral from non-viral etiologies requires careful interpretation of clinical findings and laboratory results.

Therapeutic Approaches and Innovations

Treatment of CRS during COVID-19 has emphasized conservative management to reduce infection risk, including topical nasal steroids, saline irrigations, and broad-spectrum antibiotics when indicated. For cases requiring surgical intervention, endoscopic procedures have been adapted with enhanced safety protocols, including negative-pressure rooms, personal protective equipment, and preoperative COVID-19 testing.

Recent advances focus on personalized medicine approaches, leveraging biomarkers to tailor therapy, and applying minimally invasive techniques to reduce hospital stay and aerosolization risks. Postoperative care involves meticulous infection control measures and close outpatient monitoring.

Challenges and Future Directions

Despite progress, several gaps remain, such as the lack of standardized protocols for CRS management in COVID-19-positive patients and limited data on long-term outcomes. Future research should emphasize longitudinal studies on post-pandemic management, integration of AI-driven diagnostics, and development of rapid, accurate testing tools.

Conclusion.

Despite these advances, challenges remain, including the lack of standardized protocols for managing CRS in COVID-19-positive patients and limited long-term outcome data. Future research should focus on establishing evidence-based guidelines, integrating AI-driven

diagnostics, and developing rapid testing modalities to facilitate timely decision-making. The experience gained during this period highlights the importance of adopting flexible, innovative, and multidisciplinary approaches to enhance patient care in the evolving landscape of ENT health. Continued efforts are crucial to optimize diagnostic accuracy, improve therapeutic efficacy, and ultimately elevate standards of care for CRS patients in a post-pandemic era.

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