

Maxillary Sinus Cyst and Angiolipoma: A Case Report at Wangaya Regional General Hospital, Indonesia

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ABSTRACT

Paranasal sinus cysts are benign lesions that are often asymptomatic. In most cases, they are found in the maxillary sinus. Further radiological examinations, such as a head CT scan, are required. The diagnosis of angiolipoma is made through histopathological analysis. The purpose of this article is to establish the diagnosis and management of maxillary sinus cysts and angiolipoma. A 35-year-old male patient presented to the ENT clinic of Wangaya Regional General Hospital complaining of nasal congestion and headache. Based on anamnesis, physical examination, and supporting investigations in the form of a head CT scan, the patient was diagnosed with a maxillary sinus cyst and angiolipoma. The treatment chosen was surgery in the form of Functional Endoscopic Sinus Surgery (FESS) and Luc-Caldwell (LCW) procedures. After surgery, the complaints of nasal congestion and headache were reduced. Maxillary sinus cyst and angiolipoma can be challenging to diagnose because of their nonspecific clinical presentations. Initial diagnostic testing may include computed tomography (CT), and definitive diagnosis is made through histopathology. Treatment options include FESS and LCW.

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Introduction

Paranasal sinus cysts are benign lesions that are often asymptomatic. Cysts are most commonly found in the maxillary sinuses (Matkuliev et al., 2024). Maxillary sinus cysts are benign fluid-filled lesions, most commonly found on radiographic imaging (Demiri et al., 2025). The highest frequency of retention cysts occurs in men between the ages of 30-40 years with lesions reported to be unilateral and solitary (Rastegar & Osmani, 2022). Although asymptomatic, usually larger cysts can cause complaints such as nasal obstruction and facial pain. This is due to the pressure on the surrounding sinus structures (Deng et al., 2024; Lin, Yang, Wen, & Wang, 2016; Štoković et al., 2016). If the cyst is located in the ostium, it can clog the sinus opening which could potentially lead to infection (Kothiwala & Vashisht, 2023; Trimble & McCadden, 2018; Tu, Hong, & Wu, 2021; Yenigun et al., 2016). Factors that contribute to this blockage include chronic sinus inflammation, allergic reactions, trauma, and other irritants (Demiri et al.,

2025). Maxillary sinus cysts can be a predisposition to the development of recurrent rhinosinusitis and cause nasal obstruction (Rastegar & Osmani, 2022).

Angiolipoma is a rare benign fatty tumor and is a variant of the lipoma (Motazedian et al., 2021). Lipoma is a relatively rare benign mesenchymal tumor, derived from mature adipocytes. The incidence of lipomas reported in the head and neck area is 15-20% with 1-4% of them being in the oral cavity. Lipomas are most commonly found in young male patients in the second or third decade of their lives. Angiolipomas account for 6-17% of all lipomas (Bhuyan et al., 2016). Microscopic studies of angiolipomas show lipoma variants that include mature lipocyte cells and blood vessels (Motazedian et al., 2021).

The diagnosis of maxillary sinus cysts is often radiological, mainly based on CT-scans of the head (Bosmans & Vanhoenacker, 2020). Evaluation with diagnostic imaging techniques is very important before performing surgical intervention on the maxillary sinuses and to avoid possible complications. Histopathological examination is important to determine the definitive diagnosis and appropriate management (Pérez-Sayáns et al., 2020). The most definitive diagnosis for lipoma is by using histopathology. (Rao, 2023) The case report describes a 35-year-old man with a clinical picture that is not so specific to maxillary sinus cysts and angiolipoma that it can be challenging in the diagnosis of this case. An initial diagnostic examination that can be done with Computed Tomography (CT) (Claessens et al., 2015; Doğan, de Roos, Geleijns, Huisman, & Kroft, 2015; Li et al., 2020; Schulz, Stein, & Pelc, 2021).

Research on paranasal sinus cysts and angiolipomas has been extensively conducted, yet specific studies discussing their coexistence and diagnostic challenges remain limited. For instance, Aydin et al. (2019) in *The Journal of Craniofacial Surgery* examined 120 cases of maxillary sinus cysts and found that although most lesions were asymptomatic, their radiological similarity to other benign or malignant masses often led to misdiagnosis without histopathological confirmation. Meanwhile, Gupta et al. (2021) in *Head and Neck Pathology* analyzed 45 cases of angiolipoma in the maxillofacial region and reported that its clinical and radiological characteristics often mimic other soft tissue tumors, making histopathological evaluation crucial for accurate identification. Both studies emphasize the diagnostic importance of imaging and tissue analysis, but neither explores the simultaneous occurrence of these two distinct lesions within the same anatomical region (Brendle et al., 2016; Folpe & Nielsen, 2022; Gamboa, Gronchi, & Cardona, 2020; Hornick, 2017; Pulumati, Pulumati, Dwarakanath, Verma, & Papineni, 2023).

Therefore, the purpose of this study is to provide a deeper understanding of the clinical, radiological, and histopathological features that distinguish these lesions, offering insights for clinicians to improve diagnostic accuracy and treatment planning. The findings are expected to contribute to the medical literature by expanding knowledge on differential diagnosis in paranasal sinus pathology and promoting awareness of atypical lesion combinations in clinical practice.

Research Method

A 35-year-old male patient came to the ENT polyclinic of Wangaya Hospital with complaints of nasal congestion felt for approximately one year and disappeared. Complaints are accompanied by headache, dull pain in the left cheek, fullness of the face and foul discharge from the nose. The history of allergies is denied.

On physical examination, it was found that the general condition appeared to be mildly painful, composing consciousness, blood pressure 128/85 mmHg, pulse 84 times/minute, breathing 20 times/minute, temperature 36 °C. On the external nasal examination, pressure pain in the left nose and maxillary sinus pressure pain was found. On the anterior rhinoscopy examination, inferior dextra and sinistra hypertrophy and mucoid secretions were found in both noses. Examination of the ears and throat within normal limits. No enlargement of lymph nodes was found in the neck.

Laboratory tests showed the values of Hemoglobin (15.5 g/dL) and Leukocytes ($5.13 \times 10^3/\mu\text{L}$) within normal limits. In the radiological examination, a CT-scan of the focal head of the paranasal sinus axial and coronal slices was carried out without contrast and a picture of chronic rhinitis, slight deviation of the nasal septum to the left, cystic lesions with a firm limit of 2.3 cm x 2.1 cm in the anterolateral wall of the left maxillary sinus suspected simple bone cyst as shown in Figures 1 and 2.

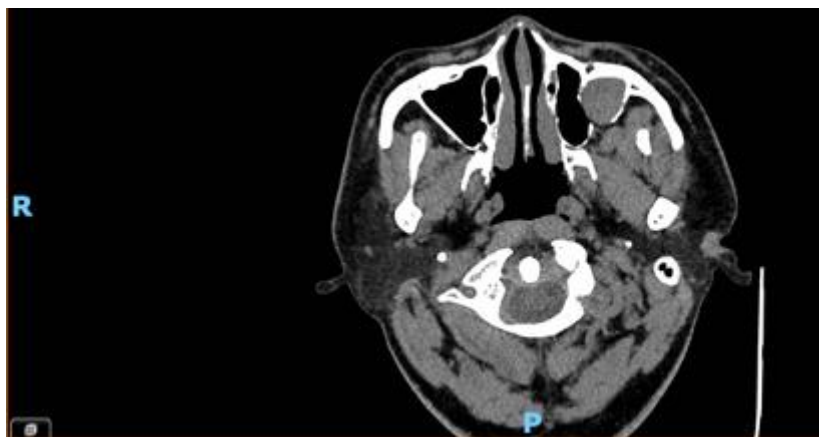


Figure 1. Axial CT scan of the head



Figure 2. Coronal CT scan of the head

Based on the anamnesis, physical examination and supporting examination, the patient was diagnosed with maxillary sinus cysts, chronic pansinusitis dextra et sinistra, inferior

concha hypertrophy dextra et sinistra. The management chosen is surgery in the form of Functional Endoscopic Sinus Surgery (FESS) and Luc-Caldwell (LCW) with general anesthesia. It was found that during surgery, the mucocoele contains purulent secretions in the maxillary sinus cavity as shown in Figure 3. In the examination of the maxillary sinus cyst pus culture sampled during intraoperative surgery, no specific pathogenic bacterial growth was found.

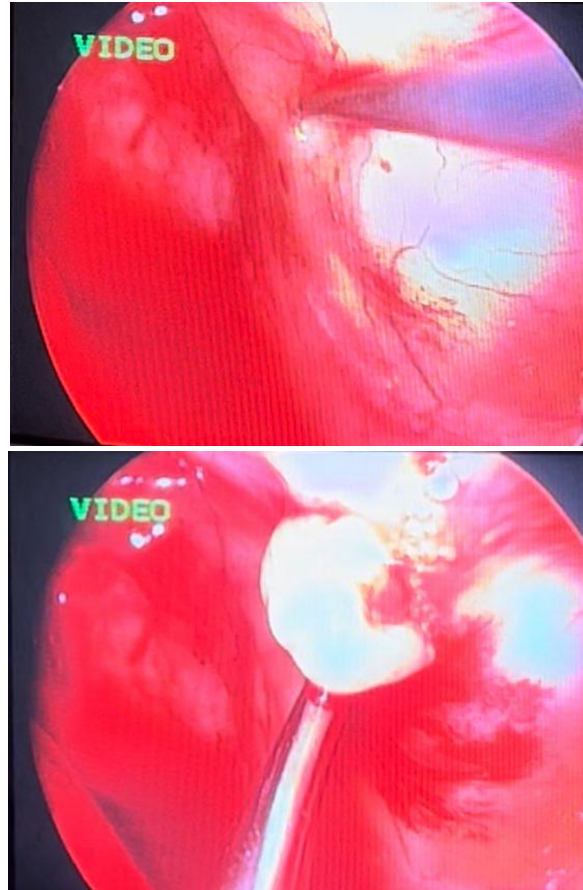


Figure 3. Intraoperative Findings : Endoscopic Imaging of the Sinistra Makillary Sinus Sinus Cavum

There was a finding of polyps in the maxillary sinus cavity after the cyst cleaning process. Polyp biopsy is performed through an endoscopic approach on the maxillary sinus cavity with a tissue cut as shown in Figure 4.



Figure 4. Intraoperative Findings: Polyp Tissue Fragment in the Sinus Maxillary Sinus Cavum

On histopathological examination, macroscopic lesions were found in the form of yellowish-white pieces of tissue. Microscopically, the preparation consists of fragments of tissue fragments consisting of the proliferation of mature fat cells and blood vessel components in the form of small blood vessels and thin-walled capillaries. Some of the lumen of these blood vessels contains thrombolytic fibrin and erythrocytes. In other foci there are also clusters of seromucous glands without signs of atypia. The morphological picture shows the proliferation of mature fatty tissue with vascular components containing intraluminal thrombi fibrin with a comparative diagnosis of angiolipoma.

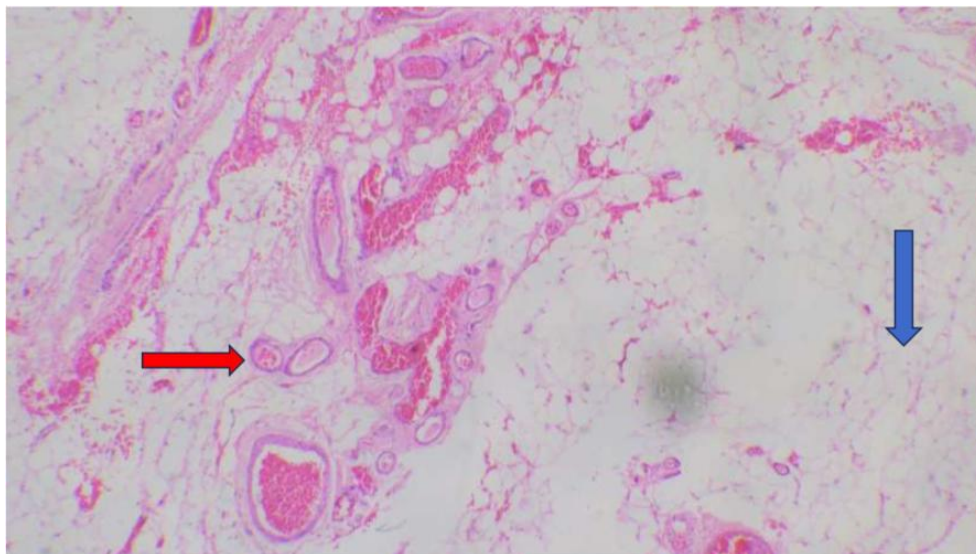


Figure 5. Proliferation of fatty tissue containing mature fat cells without signs of atypia (blue arrow) and small vascular components and thin-walled capillaries (red arrow) (HE, 40x magnification)

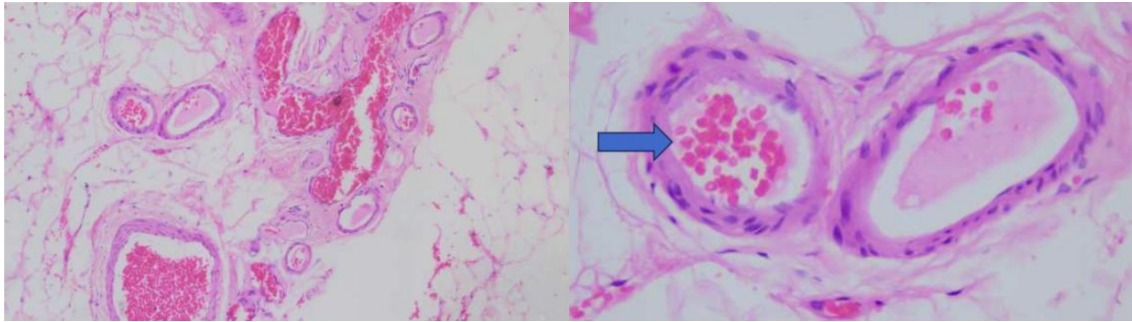


Figure 6. The lumen of the blood vessels contains thrombi fibrin and erythrocytes (blue arrows) (HE magnification 100x and 400x)

Postoperative evaluation, complaints of nasal congestion, headache and smelly snot improvement. From the nasoendoscopic examination, it appears that the surgical wound is calm as in Figures 7 and 8.

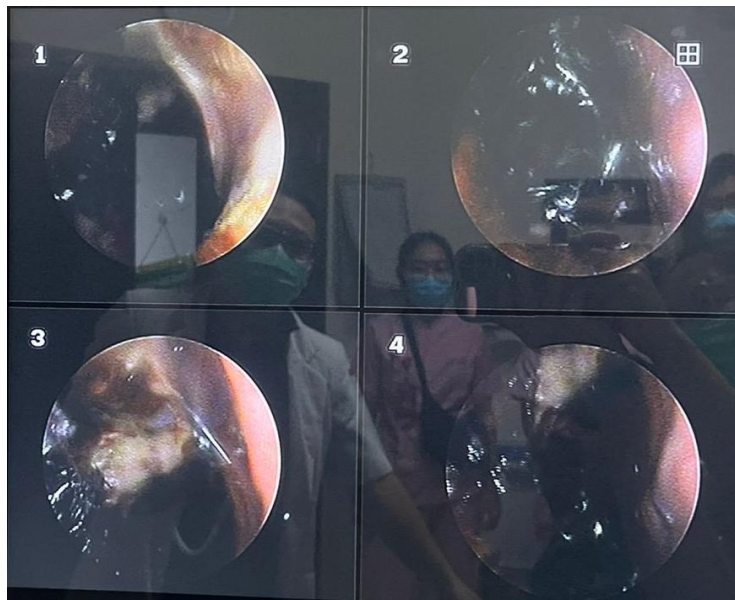


Figure 7. Nasoendoscopy Kavum Nasi Nasi Dextra Postoperative

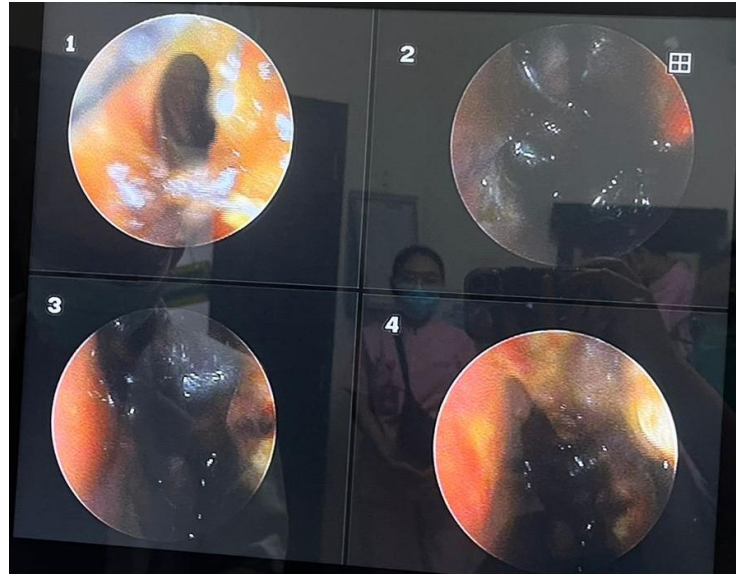


Figure 8. Nasoendoscopy Kavum Nasi Sinistra Postoperatively

Results and Discussion

The maxillary sinus is a pyramid-shaped structure with the base leading to the side wall of the nose and the apex leading to the maxillary zygomaticus process. This sinus has an ostium located on the cranial side and is connected to the meatus medius of the nasal cavity to allow the drainage process so that there is no buildup. The anatomical condition of the maxillary sinuses, specific and non-specific infectious and inflammatory processes affect the occurrence of a disease. The inflammatory process, commonly known as sinusitis, is the most common sinus pathology. In some cases, asymptomatic chronic inflammation can become cysts, mucocoeles, anthropogonal polyps, as well as benign and malignant tumors (Pérez-Sayáns et al., 2020). In most cases, cysts most often form in the maxillary sinuses (Matkuliev et al., 2024). The common mechanism of cyst formation is the accumulation of fluid in the cavity lined with mucoperiosteal due to obstructed sinus flow. Inflammation, trauma, or a history of sinus surgery can cause obstructed sinus flow. When mucus accumulates in the cavity, it increases and results in erosion and remodelling of the surrounding bones (Yeom et al., 2022). Cysts can be differentiated into retention cysts and pseudocysts. Retention cysts are formed due to a blockage in the excretory ducts of the mucosal glands (Matkuliev et al., 2024).

Angiolipoma is a rare histological subtype of lipoma, representing less than 10% of all intraoral lipomas (Silva-Junior et al., 2013). Angiolipomas appear more often on the body and extremities than on the head and neck area (Santana Ramírez et al., 2022). The pathogenesis of angiolipoma is still unclear, but various causative factors may be related such as trauma history, hormonal differentiation of lipomatosa during puberty, fat degeneration in hemangiomas and vascular proliferation in congenital lipomas. The involvement of specific cells and cytokines in the pathogenesis of angiolipoma is still speculative but is considered important in the development of the vascular component of these lesions (Silva-Junior et al., 2013).

A maxillary sinus cyst can cause symptoms such as headache, facial pain in the sinus area, periorbital pain, paranasal sinus infection, nasal congestion, and discharge of nasal discharge. (2), (12) Based on the patient's complaints, there was a dull pain on the left cheek, a feeling of fullness on the face and a smelly discharge from the nose which was in accordance with the symptoms of maxillary sinus cysts. Based on several studies, patients with maxillary sinus cysts complained of headache by 63%, nasal congestion by 52.5% and nasal discharge by 35.7% (Demiri et al., 2025). These clinical signs are similar to complaints of maxillary sinusitis so that further radiological examination such as CT-scan is required. CT-scan is the first choice of synaptic imaging (Beate Eggesbø, 2020). In this case, a picture of chronic rhinitis was obtained, slight deviation of the rice septum to the left, cystic lesions with a firm border of 2.3 cm x 2.1 cm on the anterolateral wall of the left maxillary sinus suspected simple bone cyst. A Simple Bone Cyst is a single cyst that does not have an epithelial lining, but has an intact, fluid-filled bone wall and shows no evidence of acute or chronic inflammation (Joy et al., 2015). These lesions are more commonly found in young individuals with an age range of 2-35 years and about 78% of cases are found in the second decade. The higher predilection in men with a male-to-female ratio is 1.6 to 1 (Patil et al., 2019).

Based on the research conducted by Mario et al, with the analyzed sample consisting of 214 maxillary sinus lesions experienced by 133 men (62.1%) and 81 women (37.9%) with an average age of 46.9 years and an age range of 2.7 to 92.5 years, the most frequent pathologies are unspecified sinusitis (44.4%), polyps (18.2%), malignant tumors (9.8%), inversion papillomas (7.5%), fungal sinusitis (4.7%), cysts (3.7%), benign tumors (2.3%), mucocoeles (2.3%), and other lesions (1.9%). There were no differences related to gender and clinical diagnosis.

A histopathological examination is necessary to determine a definitive diagnosis. Histopathologically, maxillary sinus retention cysts consist of cystic cavities lined by pseudostratified ciliated columnar epithelium, typical of the respiratory mucosa. The cyst contains serous or mucous fluid and shows no signs of inflammation or infection, and the epithelial layer remains intact (Demiri et al., 2025). The histopathological picture of the mucocoele is a cystic cavity, lined by a thin membrane composed of pseudostratified ciliated cylindrical epithelium (sinus mucosa), interspersed with areas of hyperplasia, supported by fibrous connective tissue with areas of edema, numerous capillaries, some of which are congestive and mixed inflammatory exudates. Amorphous and eosinophilic with inflammatory cells (lymphocytes and plasma cells) scattered in the mucosa (Demichieri et al., 2016). Histology, the description of a simple bone cyst indicates the presence of a dense inflamed connective tissue stroma with extravasated red blood cells, necrotic changes and chronic inflammatory cells. In addition, no signs of epithelial were found (Joy et al., 2015).

Benign lipomas are categorized into classic lipomas and other variant lipomas such as angiolipomas, osteolipomas, chondroid lipomas, myolipomas, spindle cell lipomas, hemartomatosa lesions, diffuse lipomatous proliferation and hibernoma. The histological characteristics of the angiolopoma show a solidly bounded, sometimes

capsuled mature adipocyte proliferation (usually representing 50% of the tumor mass) and scattered connective tissue fibers, indicating a proliferation of angiomatous consisting of several small to medium-sized congestive blood vessels containing fibrin thrombus and numerous mast cells. The histological guidelines for the diagnosis of angiolipoma are non-infiltration or infiltration angiolipoma, the presence of 50% mature adipocytes within the tumor, proliferation of angiomatous spread within the tumor, fibrinose microthrombus, absence of other mesenchymal elements (smooth muscle) or pleomorphism (Bhuyan et al., 2016).

Various management approaches for maxillary sinus cysts such as observation, FESS, Caldwell-Luc procedure, root canal treatment or tooth extraction, and steroid injections. If the cyst is asymptomatic, non-surgical observation may be chosen as a management procedure with periodic examinations to assess the possibility of cyst growth and complications. FESS is performed when associated with chronic sinusitis, the size of the cyst is large and causes nasal obstruction. The Caldwell-Luc procedure has the advantage of providing direct access to the cyst thus facilitating the process of thorough cyst removal and preventing recurrence. Root canal treatment or tooth extraction is performed on odontogenic cysts or accompanied by dental infections. Giving steroid injections as an adjunct treatment to symptoms, does not eliminate cysts and has potential side effects from steroids (Demiri et al., 2025). Surgical excision is a procedure for both capsuled and non-capsule angiolipomas. Infiltration angiolipoma often penetrates the surrounding tissue, so complete tumor resection is necessary. In the maxillofacial region there are many vital structures, so surgery needs to be performed with enlargement to prevent damage to these structures (Motazedian et al., 2021). In general, recurrence in angiolipomas is rare. However, infiltration angiolipoma has a recurrence rate of 35-50%. There is no evidence that angiolipomas undergo malignant transformations (Santana Ramírez et al., 2022).

In this case, the combined technique (FESS and Caldwell-Luc approaches) is an effective method to obtain a complete surgical excision. This approach is minimally invasive, has better cosmetic results, and faster patient recovery, especially in younger patients (Elghobashy et al., 2023).

Conclusion

A 35-year-old male presented to the ENT polyclinic of Wangaya Hospital with a one-year history of nasal congestion, headache, and foul-smelling nasal discharge. Clinical evaluations, including anamnesis, physical examination, and supportive imaging, confirmed a diagnosis of maxillary sinus cyst and angiolipoma. The patient underwent Functional Endoscopic Sinus Surgery (FESS) and Luc-Caldwell (LCW) procedures, with histopathological findings consistent with angiolipoma. Postoperative outcomes showed significant improvement in nasal congestion, headache, and nasal discharge. Future research should focus on identifying early diagnostic markers and evaluating long-term outcomes of combined surgical approaches for rare sinonasal lesions such as maxillary sinus angiolipoma.

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