sinusitis

MDPI

Case Report

A Single-Stage Procedure for Correction of Silent Sinus Syndrome: A Case Report About Our Experience

Aurelio D'Ecclesia [1], Stefano Patruno [2], Christian Fiorentino [2,*] and Lazzaro Cassano [3]

[1] Department of Maxillofacial Surgery and Otolaryngology, IRCCS Casa Sollievo della Sofferenza, 71013 San Giovanni Rotondo, Italy; a.decclesia@operapadrepio.it
[2] Unit of Otolaryngology, Department of Clinical and Experimental Medicine, University of Foggia, 71100 Foggia, Italy; stefpat444@gmail.com
[3] Complex Unit of Maxillofacial Surgery and Otolaryngology, Fondazione IRCCS Casa Sollievo della Sofferenza, 71013 San Giovanni Rotondo, Italy; l.cassano@operapadrepio.it
* Correspondence: colecisti1@gmail.com

Abstract: Silent sinus syndrome is a rare condition characterized by an almost always unilateral collapse of the maxillary sinus. The most characteristic symptom of this syndrome is enophthalmos. Naso-sinusal disorders are rarely associated with this condition. We are going to discuss a case that was associated with recurrent sinusitis. In this case report, we describe how we managed this rare syndrome so we can share our experience with those colleagues that may face this condition.

Keywords: silent sinus syndrome; surgery; sinusitis; management; endoscopy

1. Introduction

Silent sinus syndrome (SSS) is a syndrome characterized by a reduced volume of the maxillary sinus, almost always unilateral, with associated enophthalmos and, usually, an absence of a pathology affecting the paranasal sinuses. In our case report, we describe a patient who had SSS and suffered from recurrent sinusitis. We will discuss our management of this case and show how correct diagnosis and treatment may enable preventing the onset of naso-sinus disorders and further facial deformations [1,2].

2. Case Report

A 58-year-old woman underwent observation for double-sided nasal obstruction and a history of recurrent sinusitis and headache. The patient formerly underwent treatment with nasal irrigation and intranasal corticosteroid sprays but did not benefit from them, and persistence of headache was observed at the end of the treatment. On physical examination, a right-convex deviation of the nasal septum with hypertrophy of the inferior turbinates was observed. Nasal endoscopy was performed too, confirming the observations during the physical examination and showing no signs of pathology involving the paranasal sinuses. During nasal endoscopy, an indentation of the medial wall of the left maxillary sinus was observed, so, considering the clinical picture, it was therefore decided to subject the patient to a radiological evaluation. A CT scan was therefore carried out, which documented a right-convex deviation of the nasal septum with a small bone spur that projected at the right-middle meatus, partially reducing the nasal airway at that level, concha bullosa of the left-middle turbinate, regular pneumatization of the nasal and paranasal cavities, and hypopneumatization of the left maxillary sinus compared to the contralateral one. No obstructive causes were observed involving the osteo-meatal complexes bilaterally (Figure 1A–D). An ophthalmological evaluation was therefore performed even if there were no visual disturbances. The ophthalmologist and our team agreed then on a surgical endonasal single-stage approach to avoid the worsening of the clinical picture, agreeing that a conservative treatment could not have been carried out, as reported in the literature.

check for updates

Citation: D'Ecclesia, A.; Patruno, S.; Fiorentino, C.; Cassano, L. A Single-Stage Procedure for Correction of Silent Sinus Syndrome: A Case Report About Our Experience. *Sinusitis* **2024**, *8*, 68–71. https://doi.org/10.3390/sinusitis8020009

Academic Editor: Sy Duong-Quy

Received: 4 September 2024
Revised: 25 November 2024
Accepted: 2 December 2024
Published: 3 December 2024

Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).



Figure 1. (**A**,**B**) CBCT view: the axial plane shows contraction and reduction regarding the left sinus. (**C**) CBCT view: the coronal plane shows the difference in the orbital cavity height. (**D**) CBCT view: coronal view of the left osteo-meatal complex.

In light of the clinical picture, the patient underwent a single-stage procedure, which consisted of a standard left uncinectomy, standard antrostomy of the left maxillary sinus, septoplasty, and turbinoplasty. Considering the mild enophthalmos and the good opening and ventilation of the maxillary sinus restored through the endoscopic approach, a conservative treatment on the orbital floor was chosen, avoiding further surgery. A very small sample of mucous material was also taken from the antrostomy cavity, which, after histological examination, was diagnosed as mucus mixed with granulocytes. Two months after the operation, the patient underwent a further endoscopic evaluation, which documented good ventilation of the maxillary sinus affected by SSS. No postoperative surgical complications were documented. No further episodes of sinusitis were observed after the surgery, and the opening and ventilation of the maxillary sinus remained effective in all the following endoscopic check-ups. Six months after the surgery, the patient underwent an ophthalmic check-up, which showed no evolution of the mild enophthalmos. In the light of these observations, it was therefore decided not to perform further CT scans in order to avoid unnecessary exposure to ionizing radiation for the patient.

3. Discussion

SSS is a rare clinical syndrome that is characterized by a collapse of the maxillary sinus, usually unilateral and rarely associated with naso-sinus symptoms. The most frequently associated sign is enophthalmos, which tends to progress, and ocular hypoglobulia [1]. SSS affects both sexes equally and tends to present between the fifth and sixth decades of life [3–5]. The symptoms that are most frequently complained about by patients are facial deformities, enophthalmos, and hypoglobulia with or without associated diplopia [6–9]. SSS is differentially diagnosed with facial hemiatrophy, progressive lipodystrophy, Horner's syndrome [3,4,10], sinus hypoplasia, and chronic maxillary atelectasis (CMA), although the latter is considered by some authors to be the same thing [3,10–13]. The etiopathogenesis of SSS remains unknown at the moment, but it is a common opinion that the triggering factor is an obstruction of the osteo-meatal complex (COM), following which negative pressure is developed within the maxillary sinus with a consequent collapse and associated orbital deformations [1,14]. The most frequent causes of this obstruction of the COM are anatomical malformations (e.g., deviation of the nasal septum) or chronic inflammatory pathologies affecting the nasal cavity or paranasal sinuses [1,15]. There is a second theory regarding the origin of SSS according to which the cause is to be found in the contraction and hypotonia of the masticatory muscles with consequent aspiration of air from the closed space of the maxillary sinus and subsequent collapse of the sinus walls [6,9]. Still, other authors suggest that SSS occurs in patients with congenital hypoplasia of the maxillary sinus, which is subsequently associated with an inflammatory pathology [3,4,16]. The diagnosis of SSS occurs through physical examination, associated with nasal endoscopy and a CT scan, demonstrating the volumetric reduction in the affected maxillary sinus. MRI is also helpful in its diagnosis. Once the diagnosis has been defined with certainty, SSS can be treated. Currently, several options are available, but the gold standard is considered to be maxillary endoscopic antrostomy and uncinectomy with FESS [3,10]. The literature reports the possibility of also treating patients affected by SSS with balloon dilatation of the ostium of the maxillary sinus in an office-based setting [1,17]. The objective, in any case, is to re-establish correct ventilation of the maxillary sinus affected by SSS [3,10]. There is no consensus regarding the management of orbital deformities; in fact, some authors suggest the need for the treatment of orbital deformities in a single surgical approach or with a two-stage approach, while other authors suggest that isolated FESS surgery consisting of a uncinectomy and associated middle meatal antrostomy is sufficient to resolve the retraction of the orbital floor [3,5,9,10,13,18–20]. It is very important that the patient treated for SSS undergoes careful follow-up to ensure sinus patency and cessation of the progression of the manifestation of SSS [1,15]. It is important that the ophthalmologist is also involved in the follow-up, whose role is fundamental both in the diagnosis and in verifying that there is no progression of the pathology after the treatment [1].

4. Conclusions

SSS is a pathology that remains inadequately understood due to its rarity. The etiopathogenesis is not defined but appears to be attributable to the reduced ventilation of the maxillary sinus. Surgical treatment, which consists of re-ventilating the maxillary sinus via maxillary sinus antrostomy and uncinectomy, has shown good efficacy, and, currently, new treatment options have been proposed, widening the possibility of choice for the surgeon. However, there is currently no unanimous consensus on the management of orbital deformities. In the future, it will therefore be important to define a correct therapeutic protocol that enables us to avoid subjecting the patient to a double surgery and correctly integrate the ophthalmologist, the ENT, and the maxillofacial surgeon in the diagnosis, treatment, and follow-up of these patients to ensure satisfactory and permanent results.

Author Contributions: All authors of this case report have directly participated in the planning, execution, or analysis of this manuscript. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval for this case report were waived by the ethics committee at the authors' institutions.

Informed Consent Statement: The informed consent has been obtained in written form.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Alyousef, M.; Alromaih, S.; Aldokheel, B.; Alroqi, A. Bilateral maxillary silent sinus syndrome: A case report and literature review. *SAGE Open Med. Case Rep.* **2023**, *11*, 2050313X231211712. [CrossRef] [PubMed]
2. Suh, J.D.; Ramakrishnan, V.; Lee, J.Y.; Chiu, A.G. Bilateral silent sinus syndrome. *Ear Nose Throat J.* **2012**, *91*, E19–E21. [CrossRef] [PubMed]
3. Tousidonis, M.; Alvarez-Mokthari, S.; Khayat, S.; de Moreta, G.S.; Ochandiano, S. Contemporary Treatment of Silent Sinus Syndrome: A Case Report and Literature Review. *Cureus* **2024**, *16*, e57577. [CrossRef] [PubMed]
4. Tieghi, R.; Malagutti, N.; Valente, L.; Carnevali, G.; Clauser, L.C. Combined endoscopic and trans palpebral orbital reconstruction for silent sinus syndrome. *J. Craniofac. Surg.* **2017**, *28*, 955–958. [CrossRef]
5. Sesenna, E.; Oretti, G.; Anghinoni, M.L.; Ferri, A. Simultaneous management of the enophthalmos and sinus pathology in silent sinus syndrome: A report of three cases. *J. Craniomaxillofac. Surg.* **2010**, *38*, 469–472. [CrossRef] [PubMed]
6. Salari, S.; Anbiaee, N.; Baee, M.B. Silent sinus syndrome: A case report. *Clin. Case Rep.* **2023**, *11*, e8095. [CrossRef] [PubMed]
7. Cobb, A.R.; Murthy, R.; Gary, C.S.C.; El-Rasheed, A.; Toma, A.; Uddin, J.; Manisali, M. Silent sinus syndrome. *Br. J. Oral Maxillofac. Surg.* **2012**, *50*, e81–e85. [CrossRef]
8. Rose, G.E.; Sandy, C.; Hallberg, L.; Moseley, I. Clinical and radiologic characteristics of the imploding antrum, or silent sinus, syndrome. *Ophthalmology* **2003**, *110*, 811–818. [CrossRef] [PubMed]
9. Arnon, R.; Gluck, O.; Winter, H.; Pikkel, J.; Rubinov, A. Combined single-step procedure for correction of silent sinus syndrome. *Case Rep. Ophthalmol.* **2019**, *10*, 95–100. [CrossRef]
10. Rosso, C.; Saibene, A.M.; Felisati, G.; Pipolo, C. Silent sinus syndrome: Systematic review and proposal of definition, diagnosis and management. *Acta Otorhinolaryngol. Ital.* **2022**, *42*, 305–316. [CrossRef]
11. Magalhães, C.; Baptista, M.; Lopes, G.; Duarte, D. Silent sinus syndrome: An underdiagnosed entity. *BMJ Case Rep.* **2015**, *2015*, bcr2015210548. [CrossRef] [PubMed]
12. Albadr, F.B. Silent sinus syndrome: Interesting computed tomography and magnetic resonance imaging findings. *J. Clin. Imaging Sci.* **2020**, *10*, 38. [CrossRef] [PubMed]
13. Sivasubramaniam, R.; Sacks, R.; Thornton, M. Silent sinus syndrome: Dynamic changes in the position of the orbital floor after restoration of normal sinus pressure. *J. Laryngol. Otol.* **2011**, *125*, 1239–1243. [CrossRef]
14. Trope, M.; Schwartz, J.S.; Tajudeen, B.A.; Kennedy, D.W. Bilateral silent sinus syndrome: A rare case and review of literature. *Allergy Rhinol.* **2017**, *8*, 100–102. [CrossRef]
15. Rullan-Oliver, B.; del Toro-Diez, E.; Portela-Arraiza, J.C. Natural progression of bilateral maxillary silent sinus syndrome: A metachronous case report. *SAGE Open Med. Case Rep.* **2020**, *8*, 2050313X20902339. [CrossRef] [PubMed]
16. de Dorlodot, C.; Collet, S.; Rombaux, P.; Horoi, M.; Hassid, S.; Eloy, P. Chronic maxillary atelectasis and silent sinus syndrome: Two faces of the same clinical entity. *Eur. Arch. Otorhinolaryngol.* **2017**, *274*, 3367–3373. [CrossRef] [PubMed]
17. Sun, D.Q.; Dubin, M.G. Treatment of chronic maxillary atelectasis using balloon dilation. *Otolaryngol. Head. Neck Surg.* **2013**, *149*, 782–785. [CrossRef] [PubMed]
18. Raveggi, E.; Sobrero, F.; Gerbino, G. Patient specific implants for orbital reconstruction in the treatment of silent sinus syndrome: Two case reports. *J. Pers. Med.* **2023**, *13*, 578. [CrossRef] [PubMed]
19. Babar-Craig, H.; Kayhanian, H.; De Silva, D.J.; Rose, G.E.; Lund, V.J. Spontaneous silent sinus syndrome (imploding antrum syndrome): Case series of 16 patients. *Rhinology* **2011**, *49*, 315–317. [CrossRef] [PubMed]
20. Clarós, P.; Sobolewska, A.Z.; Cardesa, A.; Lopez-Fortuny, M.; Claros, A. Silent sinus syndrome: Combined sinus surgery and orbital reconstruction—Report of 15 cases. *Acta Otolaryngol.* **2019**, *139*, 64–69. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.