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Article

Clinical-Based Phenotyping of Odontogenic Sinusitis

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Abstract: Background: Odontogenic sinusitis (ODS) is a condition needing a multidisciplinary approach to be successfully treated. Effective communication between the involved health providers reduces chances of errors and treatment failure. **Purpose:** This study proposes a new classification of ODS facilitating the communication of pivotal information. **Study design, setting, sample:** In this observational study the authors considered 124 consecutive patients with ODS treated in the Campus Bio-Medico of Rome Foundation Hospital. **Predictor/exposure/independent variable:** The main elements influencing the treatment of this condition resulted as: Timing, Etiology, Presence of foreign Body, maxillary Obstruction of the ostiomeatal complex, and presence of oroantral Fistula (OAF); these elements were organized in the acronym TEBOF. **Main outcome variables:** Each patient received a TEBOF classification. The "T" was categorized in "Tc" for patients diagnosed with chronic sinusitis, "Ta" for of acute sinusitis, and "T0" for patients with maxillary sinus foreign body without sinusitis. The "E" was differenciated in "Ec" when the condition was a side effect of a primary dental pathology, "Eb" when the initial cause was not a dental implat, and "Ea" for when the initial cause was having a dental implat placed. "B" was reported as "B1" when there was a maxillary sinus foreign body and "B0" when there was not. "O" was reported as "O1" when the ostiomeatal complex resulted closed and "O0" when it was clear. "F" was used as "F1" when there was a communication, and "F0" when there was not. **Covariates:** A preliminary assessment considering the change in the classification in the groups of patients that underwent different therapeutic approaches. **Analyses** This classification provides a concise and easy-to-understand combination facilitating communication between the various healthcare providers who are essential for the appropriate treatment of this condition. **Results:** TEBOF classification provides similar data of other analogues, but signals clearly pivotal clinical elements. **Conclusions and Relevance:** In the authors opinion this classification provides a more rapid, complete and clear way to transfer information between health professional. This classification could contribute insight useful to decide the type and the timing of the therapeutic approaches.

Keywords: Odontogenic sinusitis; monolateral sinusitis; maxillary sinusitis

1. Introduction

Odontogenic Sinusitis (ODS) is an infectious condition of the paranasal sinuses resulting from dental pathology or treatment. Historically, dental diseases such as periodontitis, periodontal abscesses, or periapical diseases, as well as dental trauma, have been reported to be responsible for 10-12% of maxillary sinusitis, but recent studies suggest a real incidence up to 30% [1,2] . The increased incidence of ODS is also probably trackable to an increase in the number of dental implant procedures [3].

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ODS usually involves the maxillary sinus monolaterally, because of the proximity of the teeth roots to the floor of the sinus. A dental infection or iatrogenic injuries (e.g. dental implants, oroantral communication following dental extractions and sinus floor elevation, foreign bodies) can violate the Schneiderian membrane, carrying infection and triggering a mucosal inflammatory response [1,4,5]. This phenomenon causes a unilateral maxillary sinus mucosal thickening and radiological opacification. The infection and inflammation of the maxillary sinus causes the symptoms associated with ODS and eventually can also spread to other near paranasal structures [2].

The diagnosis is often challenging due to diversified clinical presentation [6]. One of the challenges with diagnosing ODS is that patients often require evaluations by both otolaryngologists and dental providers. When otolaryngologists are first consulted, the clinical presentations can mimic nonodontogenic rhinosinusitis, and odontogenic sources may not be investigated [7]. Similarly, if patients present firstly to dental providers with maxillary dental pathology, sinusitis can be overlooked. Patients affected by classical ODS usually present symptoms of rhinosinusitis, but foul smell is more specific of ODS, while dental pain is unfrequently. Some patients will be asymptomatic [6].

According to consensus statement on diagnosis of ODS, in presence of these elements is necessary a multidisciplinary evaluation with otolaryngologist and dental provider [8]. The otolaryngologist should confirm sinusitis with nasal endoscopy by identifying unilateral purulence, oedema, or polyps in the middle meatus, or maxillary sinus. The dental provider confirms odontogenic sources of sinusitis evaluating the presence of necrotic o partially necrotic pulp or failing root canal therapy.

The multidisciplinary approach ensures a correct diagnosis and consequently an appropriate therapy. Otolaryngologists and dental providers should check for dental discomfort, oroantral fistula (OAF), pathologies, or previous treatments as well as sinusitis symptoms and dental pain. In cases with ODS otolaryngologists should typically confirm the sinusitis, and dental specialists should typically confirm the odontogenic pathology [9].

The otolaryngologist, dental provider, and patient should collaborate on management decisions and talk about the advantages and disadvantages of endoscopic sinus surgery (ESS) and dental care. When both dental procedures and ESS are carried out for ODS brought on by endodontic disease, periodontitis, permanent OAF, and dental implants, the majority of case series have reported high success rates of 90% to 100% [4] . Oral antibiotics alone has been shown a low efficacy [7]. Patient with strong sinonasal symptoms and few dental complaints may benefit from primary ESS to relieve symptoms rapidly, followed by eventual any necessary dental care [10]. It is advisable to prioritize the district causing the least tolerable symptoms for the patient. ESS is often required following primary dental care either to relieve sinonasal symptoms or to prevent risk orbital or cerebral consequences of ODS [11], but also hybrid approaches such as the osteoplastic surgical approach (OPSA) to the maxillary sinus can be effective [12].

The heterogeneity of causes, clinical presentation, and treatment requires a different clinical strategy than "classic" rhinosinusitis. The literature on ODS is varied, this is due both to its clinical heterogeneity and the involvement of different professional figures [8]. The creation of uniform classification standards is necessary given the lack of defined guidelines.

The aim of our study is to create a classification that considers the clinical-instrumental aspects, to be able to identify all the characteristics using a simple and compact alphanumeric code.

2. Materials and Methods

A retrospective study was performed considering 124 patients visited and operated in the department of integrated therapies in otolaryngology Rome Biomedical Campus University Foundation from December 2020 to September 2023 and that have consented to the use of the clinical data reported in this article by signing a specific consent form. This retrospective analysis was performed in compliance with the World Medical Association Declaration of Helsinki on medical

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research protocols and ethics, being a retrospective analysis it was exempted from institutional review board approval.

A 3-year retrospective analysis was conducted, considering clinical results, demographic variables (age and sex), disease etiology and progression, imaging, and surgical and medicinal interventions [Table A1].

The inclusion criteria applied were: (1) clinical diagnosis of sinusitis with suspected odontogenic etiology, supported by radiological and/or endoscopic findings and with medical treatment resistance; (2) specialist (ENT/maxillofacial surgeon or dentist) agreement on the odontogenic focus; (3) presence of maxillofacial computer tomography (CT) scan executed before the surgery.

The exclusion criterion was a history of chronic rhinosinusitis with or without polyps.

Clinically, patients referred purulent rhinorrhea, unilateral and bilateral nasal blockage, maxillary discomfort, and postnasal drip, which occurred later than dental treatments or disease. These symptoms did not respond to steroid (topical and systemic) and antibiotic therapy.

ENT examination is performed with flexible endoscope to examine the sinuses and discover areas of inflammation, displaced dental implants, or anatomical anomalies (turbinate anomalies, nasal polyps, septal deviation).

Dentist examination evaluates presence of OAF or dental lesions.

A CT scan of the paranasal sinuses without contrast material which revealed the location, extent, and severity of the disease, presence of foreign body in maxillary sinus, obstruction of ostiomeatal complex, OAF.

Our classification considers five factors: timing, etiology, presence of oro-antral fistula, obstruction of ostiomeatal complex and presence of foreign body.

Timing

The first factor that is evaluated with this classification is the duration of the symptoms (**T= timing**), dividing the ODS into two subclasses:

- subclass A: when the symptoms have been present for less than 6 months (**a = acute**)
- subclass C: when the symptoms last more than 4 months (**c = chronic**)
- subclass 0: when a foreign body at the level of the maxillary sinus can be seen even when the patient does not have any sinusitis symptoms (**0 = without sinusitis**)

Etiology

The second factor is the cause of ODS (**E= etiology**). For this factor we have resumed the classification of Felisati [1] using the relation with oral surgery or disease:

- subclass A includes sinusitis which occurs as a complication of a dental implant (**a= after**)
- subclass B includes those which occur as a complication of treatments preceding a dental implant, such as sinus lift (**b= before**)
- subclass C those that occur as a complication of a dental disease (**c=classical complication**)
- Foreign Body, Obstruction, Fistula

The third, fourth and fifth factors evaluate the clinical pattern that is observed through fibroscopy performed by the ENT, dental examination, and CT of the facial mass. Specifically, is evaluated the **absence (0**) or the **presence (1**) of three elements:

- foreign body (**B=body**)
- obstruction of ostiomeatal complex (**O = obstruction**)
- oroantral fistula (**F= fistula**)

Each factor is identified with a letter, generally the first letter, thus obtaining an acronym: TEBOF [Table 1].

Additionally, each letter has a neighbouring letter or number that designates a subclass for each factor.

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Table 1. TEBOF Classification.

Class	Subclass
Timing	**a**cute (less than 6 months)
	chronic (more than 6 months)
	0: foreign body without sinusitis
Etiology	**a**fter implantological treatment complications
	before implantological treatment
	classic complications
Foreign Body	**0**: absence
	1: presence
Obstruction of Ostomeatal Complex	**0**: absence
	1: presence
Oroantral Fistula	**0**: absence
	1: presence

Examples

- A patient suffering from sinusitis due to a complication of implantological treatment for at least 4 months, with OAF, without obstruction of ostiomeatal complex and without foreign body can be identified as: $T_cE_aB_0O_0F_1$ [Figure 1] [Figure 2]

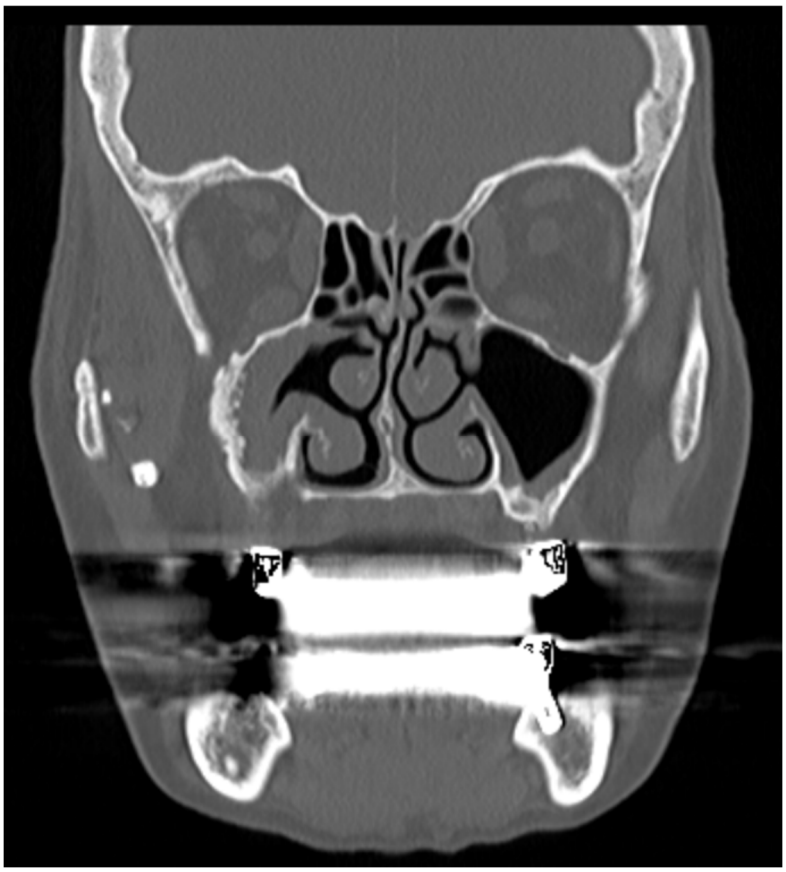

Figure 1. Slice TC 1 of patient with $TcEaB_0O_0F_1$.

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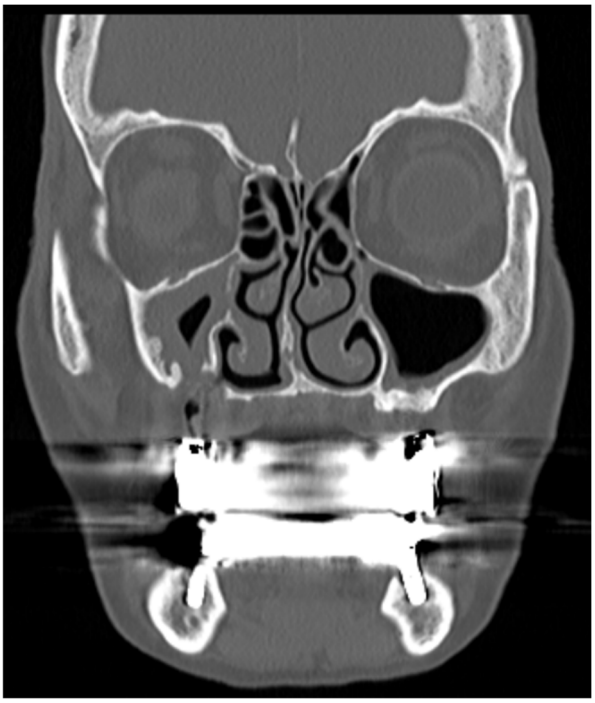

Figure 2. Slice TC 2 of patient with $T_cE_aB_0O_0F_1$.

- A patient presenting sinusitis symptoms for more than 4 months, after an implantological treatment, without a foreign body in the maxillary sinus, without obstruction of the OMC and with OAF, can be identified as: $T_aE_aB_0O_1F_1$ [Figure 3]

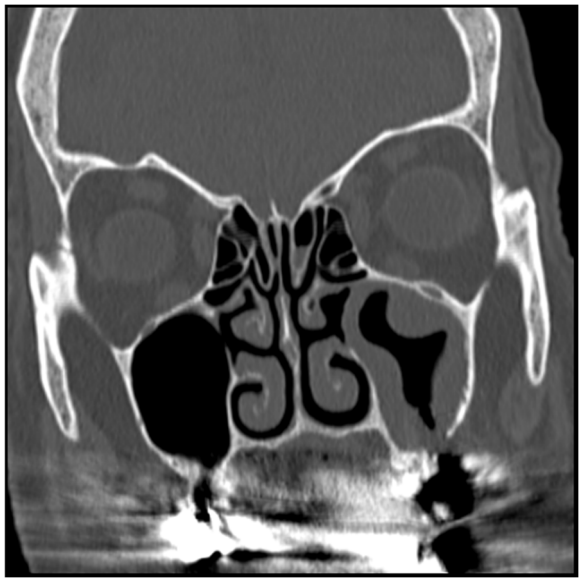

Figure 3. Slice TC of patient with $T_aE_aB_0O_1F_1$.

- A patient with chronic sinusitis as complication of dental pathology, with foreign body in the maxillary sinuses, without obstruction of the OMC and with OAF, can be identified as: $T_cE_cB_1O_0F_1$ [Figure 4]

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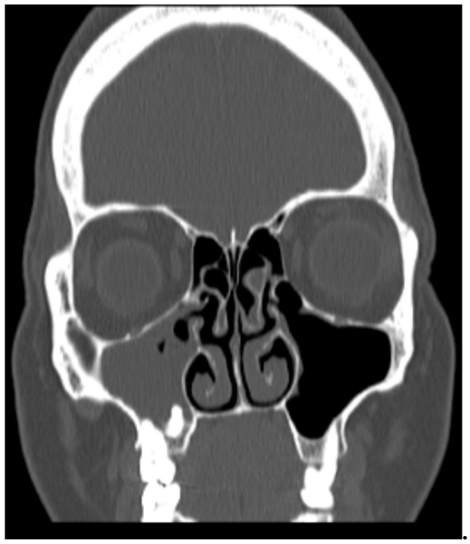


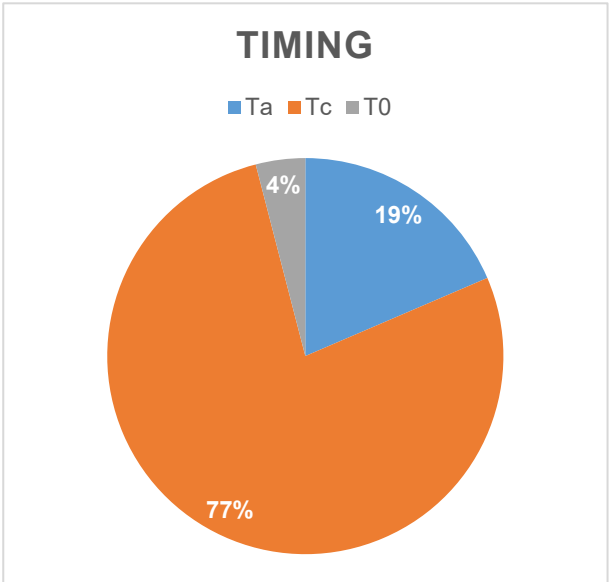
Figure 4. Slice TC of patient with $TcEcB_1O_0F_1$.

3. Results

This retrospective study includes 124 patients with clinical and/or radiological signs of maxillary sinusitis operated in the department of integrated therapies in otolaryngology (Polyclinic Campus Bio-Medico, Rome, Italy) from December 2020 to December 2023. Patients with a CT scan showing a foreign body but without sinusitis symptoms, are also included in this database because a foreign body is a trigger for sinusitis.

Of these 124 patients, 64 are women (51,6%) and 60 men (48,4%), a male to female ratio of 0.94:1. The mean age was 57.2 ± 13 years, with the youngest patient 26 years and the oldest 87 years. Every patient disclosed a history of oral surgery or dental disease.

The duration of symptoms is reported by the patient during the visit with the ENT or dentist. 96 out of 124 patients (76,8%), who had symptoms for longer than four months, were classified as chronic sinusitis patients (Tc group). 23 patients (18,4%) were classified as acute sinusitis patients (Ta group) because they had symptoms for less than four months (Graph 1). A tiny percentage of patients (4,00%), 5 in 122, were diagnosed the presence of a foreign body rather than sinusitis symptoms, placing them in the T_0 group.



Graph 1. Distribution of patients in Timing category.

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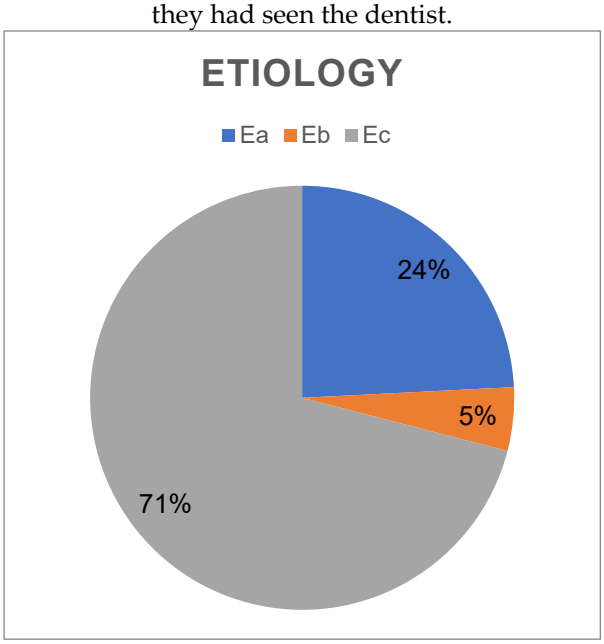
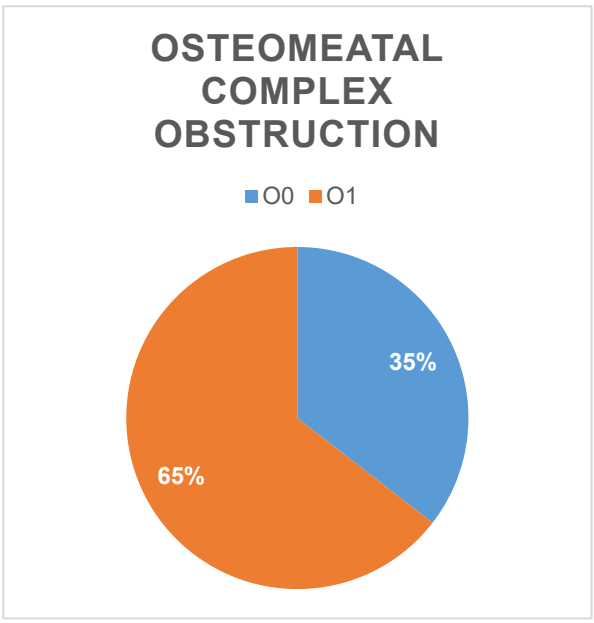
All patients had an odontogenic cause. Most patients (88; 70,04%) were included in the E_c group, where sinusitis is a side effect of a primary dental pathology. These patients frequently visit the ENT for sinus problems without being aware that there is a dental issue. On the other side, 30 (24,00%) patients were included to the "E_a" group because they reported the onset of symptoms after having had dental implants performed, while 6 (4,80%) were included to the "E_b" group because they reported the onset of symptoms before a dental implant but after an oral procedure such as a sinus lift (Graph 2). Patients of these two groups, usually comes to ENT specialist after they had seen the dentist.



Graph 2. Distribution of patients in Etiology category.

Through clinical examination and imaging, 39 foreign bodies (B_1 group), 80 (64,5%) patients with obstruction of the ostiomeatal complex (O_1 group) were observed (Graph 3). A patient may have more than one of these conditions at the same time. Most of patients presented a foreign body in the maxillary sinus (85 – 69%) (Graph 4). Oroantral fistula was observed in almost half of patients (52 – 42%). (Graph 5)



Graph 3. Distribution of patients in Ostiomeatal complex obstruction category.

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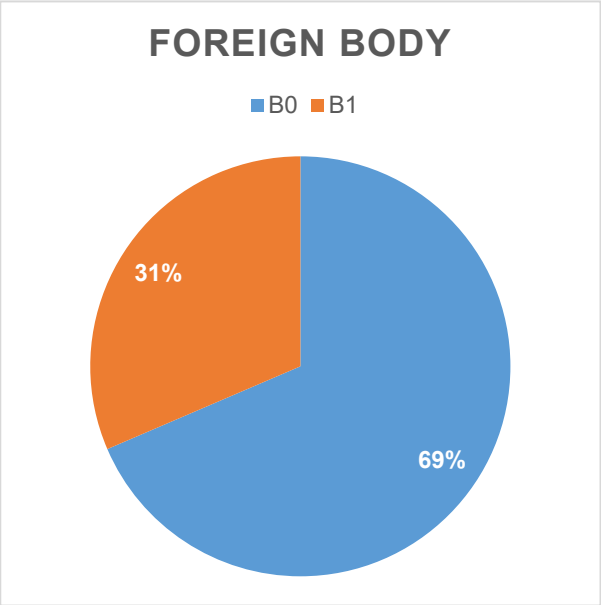
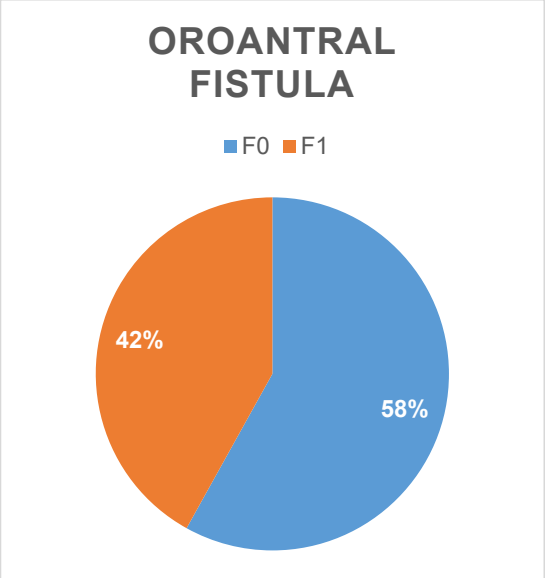


Graph 4. Distribution of patients in Foreign body category.



Graph 5. Distribution of patients in oroantral Fistula category.

All patients included in this study had already been treated with medical therapy alone, without satisfying results. Every patient received surgical care. Anatomical features such as the presence of a foreign body, an OAF, and obstruction of the ostiomeatal complex are the main factors used to determine surgical treatment. To repair OAFs and execute dental extractions, the surgical therapy can be performed by the ENT specialist alone with a FESS (20 – 16%), by the dentist alone (34 – 28%), or by a combination of methods that involves simultaneous endoscopic sinus surgery and oral procedures (63 – 51%). In some instances, a fractional combination treatment plan was implemented (7 – 5%), in which the dentist and ENT treat the pertinent issues independently of one another. (Graph 6) This flexibility of methods allows to treat this condition in a tailored fashion.

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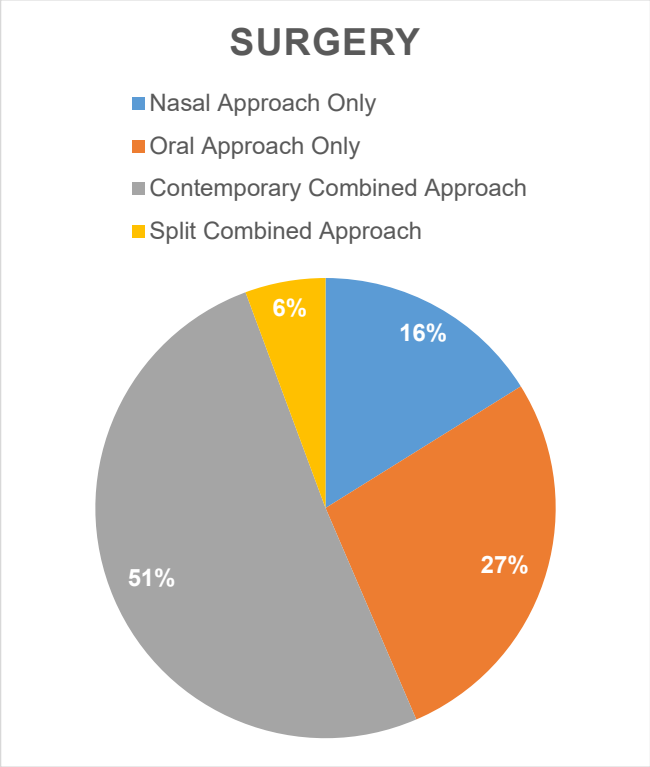

Graph 6. Surgical Approach.

4. Discussion

Other classification of odontogenic sinusitis has been proposed to identify homogenous groups of treatment [13] or radiological features [14], are already in use [1]. The classification proposed in this publication uses the basis laid on this previous works and is intended to allow for a global assessment, considering not only the primary pathology but also its etiology. By adopting a classification system that promotes a global perspective, healthcare professionals can collaborate more effectively, gain insights from different specialties, and improve the overall quality of care. This multidisciplinary approach contributes to a more nuanced and thorough representation of the patient's health status and paves the way for a tailored and effective treatment strategies.

The authors noted that the patients selected for a combined and split contemporary surgical approach presented roughly equal portion of patients with and without OAF and Foreign Body in the maxillary sinus. A more pronounced majority of patient presented obstruction of the ostiomeatal complex than in the general sample.

The subgroup of patients that were treated with intranasal approach alone reported a predictable shift towards cases without OAF or foreign body, while almost all of them presented ostiomeatal complex obstruction.

The ratio of patients with OAF and without resulted substantially even in the subgroup undergoing only intraoral approach while most of the patients in this subgroup did not present foreign body or obstruction of the ostiomeatal complex.

The portion of patient presenting classical etiology and a chronic condition is similar to the general sample, this is probably caused by selection of only patients where medical therapy resulted ineffective, this resulted in a selection bias for patient with a chronic condition.

5. Conclusions

This classification is useful for characterization of the sinusitis. Anamnesis is used to assess the duration and cause of the symptoms [15]; clinical examination by otolaryngologist and dental

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provider reveals sinusitis signs and the presence of an OAF; imaging reveals the presence of a foreign body and obstruction of the ostiomeatal complex [16].

This classification aims to provide a simple and compact combination of letters and numbers to provide to different specialists a full insight of different features of ODS in an easy and fast way, allowing easier communication between the different health professionals necessary for the proper care of this condition [17]. The presence of one or more features can guide the choice of treatment. Antibiotic therapy, surgical therapy, or a combination of the two may be used, depending on how long the symptoms last and their etiology. Of course, the best surgical method for each patient must also consider the radiological parameters as dimension and position of the foreign body [18].

The phenomenon of foreign bodies without sinusitis is also considered in this classification. The existence of a foreign body is always a trigger to inflammatory response within the sinus that may lead to sinusitis. So, in agreement with current literature, authors suggest removing the foreign body in most of the cases, even without clear sinusitis symptoms [19].

The developing of different heterologous and autologous biomaterials for the closure of the OAF presents the challenge to select the right type for the specific patient, currently the only criteria considered has been the OAF dimension [20–23], the TEBOF classification could provide a wider contest for the evaluation and indication of these devices.

Dividing the sample in subgroups based on the therapeutical approach selected highlighted some elements that could induce a therapeutic approach over another, but this preliminary analysis presents important biases derived from the retrospective nature of this paper and the size of the sample.

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Informed Consent Statement: Any research article describing a study involving humans should contain this statement. Please add "Informed consent was obtained from all subjects involved in the study." OR "Patient consent was waived due to REASON (please provide a detailed justification)." OR "Not applicable." for studies not involving humans. You might also choose to exclude this statement if the study did not involve humans. Written informed consent for publication must be obtained from participating patients who can be identified (including by the patients themselves). Please state "Written informed consent has been obtained from the patient(s) to publish this paper" if applicable.

Data Availability Statement: We encourage all authors of articles published in MDPI journals to share their research data. In this section, please provide details regarding where data supporting reported results can be found, including links to publicly archived datasets analyzed or generated during the study. Where no new data were created, or where data is unavailable due to privacy or ethical restrictions, a statement is still required. Suggested Data Availability Statements are available in section "MDPI Research Data Policies" at https://www.mdpi.com/ethics.

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

Abbreviations

The following abbreviations are used in this manuscript:

ODS	Odontogenic Sinusitis
OAF	Oroantral Fistula
ESS	Endoscopic Sinus Surgery
OPSA	Osteoplastic Surgical Approach
CT	Computer Tomography

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Appendix A

Appendix A.1

Table A1. Patients considered in this study. M: male, F: female; Ta: symptoms< for < 6 months, Tc:symptoms >6 months; Ea:after dental impantation , Eb:before dental impantation , Ec: classical complication of dental condition; B0: foreign body absent in the maxillary sinus, B1: foreign body present in the maxillary sinus; O0: free osteomeatal complex, O1: closed osteomeatal complex; F0 absence of oroantral fistula, F1: presence of oroantral fistula.

Number	Age (years)	Sex	Timing (T)	Etiology (E)	Foreign Body (B)	Obstruction of Ostomeatal Complex (O)	OroAntral Fistula (F)	Surgical Approach
1	43	F	T0	Ea	B1	O1	F1	Oral Approach Only
2	79	F	T0	Ea	B1	O1	F1	Oral Approach Only
3	40	M	T0	Ec	B1	O1	F0	Oral Approach Only
4	26	F	T0	Ec	B1	O1	F0	simultaneous Combined Approach
5	52	M	Ta	Ec	B0	O1	F1	Split Combined Approach
6	43	M	Ta	Ec	B1	O1	F1	simultaneous Combined Approach
7	72	M	Ta	Ec	B0	O1	F1	simultaneous Combined Approach
8	78	F	Ta	Ea	B0	O1	F0	Nasal Approach Only
9	70	M	Ta	Ec	B0	O1	F0	Nasal Approach Only
10	66	F	Ta	Eb	B0	O1	F0	Nasal Approach Only
11	87	F	Ta	Ec	B0	O1	F0	Oral Approach Only
12	48	M	Ta	Ea	B0	O0	F1	Oral Approach Only
13	43	M	Ta	Ec	B0	O0	F0	Oral Approach Only
14	37	F	Ta	Ea	B0	O0	F0	Oral Approach Only
15	69	F	Ta	Ea	B0	O0	F1	Oral Approach Only
16	59	F	Ta	Ea	B0	O0	F1	Oral Approach Only
17	64	M	Ta	Ec	B0	O0	F1	Oral Approach Only
18	43	F	Ta	Ec	B0	O0	F1	Split Combined Approach
19	42	F	Ta	Ec	B0	O0	F0	Oral Approach Only
20	33	M	Ta	Ec	B0	O0	F0	Oral Approach Only
21	55	M	Ta	Ec	B0	O1	F0	Nasal Approach Only

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22	30	M	Ta	Ec	B1	O1	F1	simultaneous Combined Approach
23	63	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
24	64	M	Tc	Ea	B1	O1	F0	simultaneous Combined Approach
25	83	F	Tc	Ec	B1	O1	F0	Nasal Approach Only
26	72	M	Tc	Ec	B0	O0	F1	Oral Approach Only
27	72	M	Tc	Ec	B0	O0	F1	Oral Approach Only
28	79	M	Tc	Ea	B0	O0	F0	Split Combined Approach
29	64	F	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
30	47	M	Tc	Ec	B0	O1	F1	Split Combined Approach
31	29	M	Tc	Ec	B0	O1	F0	Split Combined Approach
32	66	M	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
33	73	M	Tc	Ea	B1	O1	F0	simultaneous Combined Approach
34	58	F	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
35	49	F	Tc	Eb	B1	O1	F0	simultaneous Combined Approach
36	57	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
37	45	F	Tc	Ec	B1	O0	F0	simultaneous Combined Approach
38	72	M	Tc	Ea	B1	O1	F0	simultaneous Combined Approach
39	65	M	Tc	Ea	B1	O1	F0	simultaneous Combined Approach
40	54	M	Tc	Ea	B1	O1	F0	Nasal Approach Only
41	62	M	Tc	Ec	B0	O1	F0	Split Combined Approach
42	48	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
43	57	F	Tc	Ea	B0	O1	F1	simultaneous Combined Approach

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44	70	F	Tc	Ea	B1	O0	F1	simultaneous Combined Approach
45	58	M	Tc	Ec	B0	O0	F0	simultaneous Combined Approach
46	64	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
47	76	M	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
48	48	M	Tc	Ec	B0	O1	F0	Nasal Approach Only
49	51	F	Tc	Ec	B1	O0	F0	Nasal Approach Only
50	57	M	Tc	Ec	B0	O1	F0	Nasal Approach Only
51	73	M	Tc	Ec	B0	O0	F0	Oral Approach Only
52	61		Tc	Ec	B0	O0	F0	Oral Approach Only
53	48	M	Tc	Ec	B0	O0	F0	Nasal Approach Only
54	69	M	Tc	Ec	B0	O1	F0	Nasal Approach Only
55	55	F	Tc	Ec	B0	O1	F0	Nasal Approach Only
56	53	F	Tc	Eb	B1	O0	F0	simultaneous Combined Approach
57	67	F	Tc	Ec	B1	O1	F1	Oral Approach Only
58	63	M	Tc	Ec	B1	O0	F1	Oral Approach Only
59	42	M	Tc	Eb	B1	O0	F0	Oral Approach Only
60	70	M	Tc	Ec	B0	O1	F0	Oral Approach Only
61	51	M	Tc	Ec	B0	O0	F1	Oral Approach Only
62	46	M	Tc	Ec	B0	O0	F0	Oral Approach Only
63	78	M	Tc	Ec	B0	O0	F0	Oral Approach Only
64	39	M	Tc	Ec	B0	O0	F0	simultaneous Combined Approach
65	52	M	Tc	Ec	B0	O0	F0	Nasal Approach Only
66	76	F	Tc	Ec	B0	O1	F0	Nasal Approach Only
67	59	F	Tc	Ec	B0	O1	F0	Nasal Approach Only
68	48	M	Tc	Ec	B0	O0	F1	simultaneous Combined Approach
69	42	M	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
70	57	F	Tc	Ea	B1	O0	F1	simultaneous Combined Approach

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71	45	F	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
72	72	F	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
73	65	M	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
74	49	M	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
75	51	F	Tc	Eb	B1	O1	F1	simultaneous Combined Approach
76	48	F	Tc	Ec	B0	O1	F0	Nasal Approach Only
77	38	F	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
78	66	F	Tc	Ec	B0	O0	F1	simultaneous Combined Approach
79	34	M	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
80	69	F	Tc	Ec	B0	O1	F1	Oral Approach Only
81	53	F	Tc	Ea	B0	O1	F0	Nasal Approach Only
82	60	F	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
83	74	M	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
84	59	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
85	45	F	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
86	67	M	Tc	Ec	B0	O0	F0	simultaneous Combined Approach
87	62	F	Tc	Ec	B0	O0	F0	simultaneous Combined Approach
88	33	F	Tc	Ec	B0	O0	F1	simultaneous Combined Approach
89	49	M	Tc	Ec	B1	O1	F0	simultaneous Combined Approach
90	37	F	Tc	Ea	B1	O0	F0	Oral Approach Only
91	71	M	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
92	54	M	Tc	Ec	B0	O1	F1	simultaneous Combined Approach

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93	57	M	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
94	66	F	Tc	Ea	B1	O0	F1	simultaneous Combined Approach
95	35	M	Ta	Eb	B0	O1	F0	Nasal Approach Only
96	33	M	Tc	Ec	B0	O0	F0	Oral Approach Only
97	75	F	Tc	Ec	B0	O0	F0	Oral Approach Only
98	49	F	T0	Ea	B1	O0	F1	Oral Approach Only
99	51	F	Tc	Ec	B1	O0	F0	Oral Approach Only
100	61	F	Tc	Ec	B1	O0	F0	Oral Approach Only
101	61	M	Tc	Ec	B0	O1	F0	Nasal Approach Only
102	82	F	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
103	52	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
104	48	F	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
105	66	M	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
106	52	F	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
107	57	M	Tc	Ec	B1	O1	F1	simultaneous Combined Approach
108	50	M	Ta	Ec	B0	O1	F0	simultaneous Combined Approach
109	74	F	Tc	Ec	B0	O0	F1	Oral Approach Only
110	55	M	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
111	77	M	Tc	Ec	B0	O0	F1	Oral Approach Only
112	72	F	Tc	Ec	B0	O0	F0	Oral Approach Only
113	56	F	Tc	Ec	B0	O0	F1	Oral Approach Only
114	49	F	Tc	Ec	B1	O1	F0	simultaneous Combined Approach
115	58	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
116	49	M	Tc	Ea	B1	O1	F0	simultaneous Combined Approach

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117	43	F	Tc	Ec	B0	O1	F1	Split Combined Approach
118	54	M	Tc	Ec	B0	O1	F1	simultaneous Combined Approach
119	57	F	Ta	Ec	B0	O1	F1	simultaneous Combined Approach
120	74	F	Ta	Ea	B0	O1	F0	Nasal Approach Only
121	52	F	Tc	Ec	B0	O1	F0	simultaneous Combined Approach
122	67	F	Ta	Ea	B0	O1	F1	simultaneous Combined Approach
123	67	F	Tc	Ea	B1	O1	F1	simultaneous Combined Approach
124	69	M	Tc	Ec	B1	O1	F0	simultaneous Combined Approach

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