Review Article

Maxillary Sinusitis Caused by Retained Dental Impression Material: An Unusual Case Report and Literature Review

M Manchisi, I Bianchi[1,2], S Bernardi[3], G Varvara[4], V Pinchi[2]

Department of Medicine and Surgery, University of Parma, Parma, [1]Department of Law, University of Macerata, Macerata, [2]Department of Health Science, University of Florence, Florence, [3]Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Centre of Microscopy, University of L'Aquila, L'Aquila, [4]Department of Innovative Technologies in Medicine and Dentistry, University of Chieti–Pescara 'Gabriele d'Annunzio', Italy

Received: 08-Jul-2021;
Revision: 11-Nov-2021;
Accepted: 30-Dec-2021;
Published: 19-Apr-2022

Abstract

Surgical procedures in posterior area of maxillary might cause an oroantral communication and iatrogenic sinusitis. An undetected oroantral communication can cause the penetration of foreign bodies, such as dental impression materials, in the maxillary sinus, thereby contributing to persistent sinusitis. Given the occurrence of a very rare clinical and medicolegal case of persistent and drug-resistant sinusitis due to radiologically undetected fragments of silicone paste for dental impression in the maxillary antrum, a literature review was pursued through sensitive keywords in relevant databases for health sciences. All retrieved articles were considered and data about the kind of impression materials thrusted into the maxillary sinus, the diagnostic issues, the reported range of symptoms, and the occurrence of medicolegal issues were analyzed. The diagnosis resulted to be quite challenging and belatedly especially in case of healed oroantral communication and when the material retained in the maxillary sinus has similar radiodensity compared to the surrounding normal or inflammatory tissues. The case was then discussed in comparison with the reviewed literature for both clinical and medicolegal issues. Hints were provided to professionals to face the challenging diagnosis in similar rare cases and to avoid the possible related litigation.

Keywords: *Dental impression material, dentist negligence, iatrogenic sinusitis, oroantral communication, retained foreign body*

Introduction

The etiology of chronic or acute maxillary sinusitis ranges from microbial infection of the mucosa or of the tooth, to neoformations or iatrogenic causes.[1-4] Some iatrogenic sinusitis are triggered by foreign bodies dislocated into the maxillary sinus during dental surgery (extractions and implantology) or endodontic treatments or passing through an undetected oroantral communications (OAC).[5-12] Appropriate radiological exams can disclose most of retained foreign bodies, but in some very rare cases, the material has a nonspecific shape and an uniform radiodensity compared to the overlapped anatomical structures or the surrounding inflammatory tissues. Therefore, diagnosis can result really challenging when the OAC is healed at the onset of symptoms A rare clinical and medicolegal case of persistent drug-resistant sinusitis due to undetected fragments of silicone material in the antrum was presented. Literature review was conducted to understand the strategies to avoid the reported clinical complications and medicolegal claims.

Access this article online

Quick Response Code:

Website: www.njcponline.com

DOI: 10.4103/njcp.njcp_1662_21

Address for correspondence: Dr. I Bianchi, University of Florence Studies, Largo G. Alessandro Brambilla, 3, 50134 Florence FI, Italy.
E-mail: ilenia.bianchi@unifi.it

How to cite this article: Manchisi M, Bianchi I, Bernardi S, Varvara G, Pinchi V. Maxillary sinusitis caused by retained dental impression material: An unusual case report and literature review. Niger J Clin Pract 2022;25:379-85.

The case

The case is presented according to the CARE guidelines.[13] A female patient underwent extraction of the right first upper molar in 2016. The prosthetic temporary bridge was applied after three weeks [Figure 1] and the metal-ceramic bridge after four months. Meanwhile, the patient started to complain of facial pain and purulent drainage from the right nasal cavity which were reported to dentist several times. A skull X-rays in 2017 [Figure 2] revealed completely opacified right maxillary sinus and the ENT specialist prescribed systemic antibiotics therapy with amoxicillin/clavulanic acid 1000 mg associated with NSAD (non-steroidal anti-inflammatory drugs) and thermal therapy for several months. Numerous episodes of acute sinusitis occurred since 2019, but no OAC was detected and reported in the patient's files. Given the persistence of the symptomatology due to chronic sinusitis, the ENT specialist diagnosed unilateral nasal polyp, for which prescribed a biopsy, and then a Caldwell-Luc intervention for the right maxillary sinus. During the surgical intervention, two foreign bodies were retrieved among the inflammatory tissue that clogged the antrum. One of these was a greenish, elastic, and elongated formation of 3.5 cm whilst the other one was a harder formation like a little slice of 1 cm [Figure 3]. Chemical analysis of the materials recovered from the right antrum revealed silicon resins such as found in dental impression materials. Dentist's file lacked all the information about the type of the impression material or the technique used. Eventually, assuming a case of dental malpractice, the patient filed a complaint against the dentist who applied the prosthetic bridge. During the Civil Court trial, the defendant's expert argued that patient did not report symptoms of sinusitis after the extraction and a relevant time has passed after dental treatments since the onset of symptomatology. Thereby the silicone foreign bodies might have penetrated into the maxillary sinus due to different and following surgical treatments. The plaintiff's expert opinion was indeed accepted by the Court, who concluded that no evidence indicated a different origin from the dental impression procedures and materials for the foreign bodies into the sinus, which caused the chronic sinusitis. The patient received a compensation award for physical damages, pain, and sufferings.

Literature review

Previous cases related to dental impression materials retained in the maxillary sinus are very scarce and report varying symptoms, diagnostic pathways, and surgical approaches. Hence only a narrative revision of the literature can be addressed to provide hints to dentists, ENT (ear, nose, throat) or other specialists possibly involved in this challenging diagnosis.

Method

The search strategy included different databases: PubMed, Scopus, Embase, and Google Scholar. The search literature included the following combination of keywords: maxillary sinusitis AND/OR maxillary sinus AND/OR maxillary antrum; impression material AND/OR impression paste AND/OR foreign body.

The literature search considered a range of years from 1950 to 2021. After an initial check on the title, authors, year of publication, and abstract, the duplicates were removed and only full-text English articles (case reports and/or case series) were considered eligible.

The analysis and data collection were conducted for each case report and were based on the following parameters: the nature of the impression material, the radiographic examinations and the resulting radiodensity of the material, the method of identification of the foreign body, the kind and the onset of symptoms, and the duration between symptoms onset and the diagnosis.

Results

The search produced a total of 11 articles reporting dental impression material protruded into the maxillary sinus, but a full text was retrievable for only six papers, that were then considered eligible for the literature review [Table 1].

Ten cases[14–19] of impression material protruded into the maxillary sinus were reported in the six considered articles: eight cases related to zinc oxide eugenol (ZOE) impression paste, one to alginate, and one to silicone

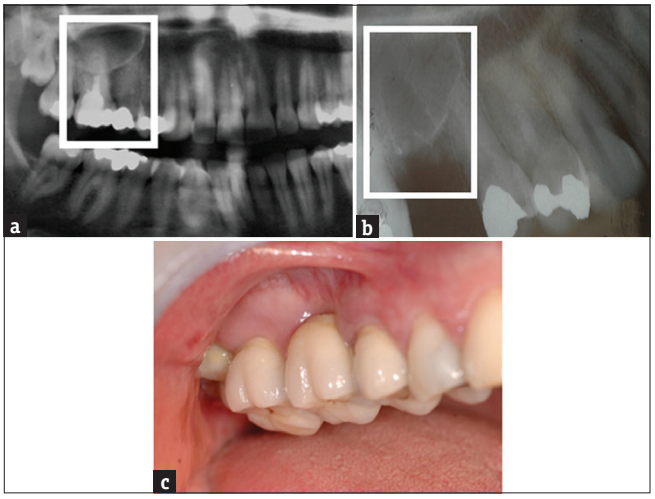

Figure 1: (a) Pre-operatory orthopantomogram (OPG). The white rectangle limits the tooth to be extracted. The apical third of the roots seems to be in continuity with the sinus floor. (b) Endo-oral radiograph showing the site extracted. (c) The final prosthetic bridge

Table 1: Articles found eligible for the literature review*

Author	N° Case - possible cause of COA	Material	X-rays and radiodensity	Identification of the foreign body nature	Symptoms and onset time span	Diagnosis time span*
Included						
Shelton (1964) [14]	One case - UME	ZOE	No X-rays taken	Identification of the specimen after surgical intervention on maxillary sinus and bioptic analysis of the material	R-side OAC, granulation tissue from OAC (within one month)	Two months
Owen (1965) [15]	One case – UME One case - UME	ZOE ZOE	Intraoral, AP and PA X-rays (radiopaque foreign body - suspected residual root) X-rays (radiopaque foreign body)	Identification of the specimen after surgical intervention on maxillary sinus and infra-red spectroscopy Identification of the specimen after surgical intervention on maxillary sinus and infra-red spectroscopy	No persistent OAC, headache, R-side pain and polypoid tissue (within few months) L-side OAC, initial sinusitis, granulation tissue from OAC (within two weeks)	Five months Three weeks
Smith (1968) [16]	One case - UME One case - UME One case - UME One case - UME	ZOE ZOE ZOE ZOE	LL sinus X-rays (a radiopaque foreign body) AP sinus X-rays (a radiopaque foreign body) AP sinus X-rays (a large radiopaque mass – suspected rhinolith) PA sinus X-rays (a radiopaque mass)	Identification of the specimen after surgical intervention on maxillary sinus and bioptic analysis of the material Identification of the specimen removed through the fistula Identification of the specimen after surgical intervention on maxillary sinus and bioptic analysis of the material Identification of the specimen after surgical intervention on maxillary sinus and bioptic analysis of the material	R-side OAC, polypoid tissue, pus, headache, pain (within few months) R-side OAC, sinusitis, pus (within few months) No persistent OAC, R-side sinusitis and pus (within few months) No persistent OAC, intermittent low-grade R-side sinusitis and pus, occasional fever, headache, and violent pus discharge (over ten years)	Two years and a half One year Two years 20 years
Gumru (1990) [17]	One case -UME and cyst enucleation	Alginate	X-rays and CT scan (extremely radiopaque mass - suspected osteoma)	Identification of the specimen after surgical intervention on maxillary sinus and radiographic investigations compared	L-side OAC, pain, granulation tissue	Not reported
Rodrigues (2009) [18]	One case - not reported	ZOE	OPG, paranasal sinus X-rays and CT scan (radiopaque foreign body - suspected antrolith)	Identification of the specimen after surgical intervention on maxillary sinus and chemical analysis of the material	R-side OAC, hypertrophic sinusal mucosa, occasional pus, intermittent headaches over the years	20 years
Deniz (2015) [19]	One case- UME	Silicone	OPG, intraoral X-rays and CT scan (granulation tissue with central calcification)	Intraoral fibroscopy	L-side OAC, polypoid tissue, pain, increased headache over the years	Four years

*Legend: ZOE (Zinc oxide-eugenol impression paste); OAC (oro-antral communication); R (right); L (left)

paste. All the articles, except one case, described the clinical history of dental extraction or surgical intervention in the posterior upper-arch area.

The time span between the impression taking and the onset of symptoms ranged from weeks to several years and the diagnosis of a sinusitis triggered by a foreign body in the antrum resulted largely delayed, ranging from a few months to several years. The radiodensity of the material into the maxillary sinus was described as varying from "highly radiopaque" for alginate, to being endowed with a radiopacity similar to the bone one for ZOE or indistinguishable to the surrounding granular/inflammatory tissues for silicone material.

All cases presented signs of unilateral sinusitis and symptoms ranging from mild, such as localized pain, nasal obstruction,[14,15] to more severe forms with fever, facial pain, and purulent discharge associated to bad smell/taste.[15-19] Only seven cases presented a persistent

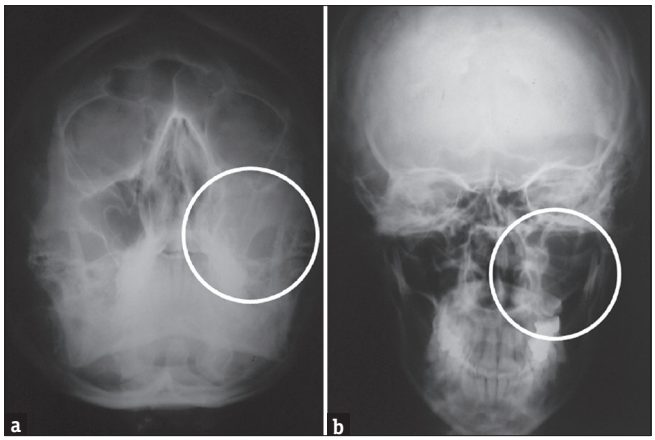

Figure 2: Post-operatory x-ray skull (Posteroanterior view). (a and b) the white circles limit and highlight the opacity of the right maxillary sinus

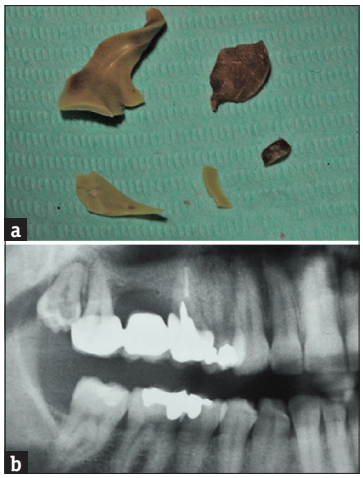

Figure 3: (a) The retrieved material. (b) OPG follow-up

and clinically evident oroantral communication (OAC) at the time of sinusitis diagnosis.[14-19]

In some patients, pre-surgical radiographic investigations had identified the presence of a foreign body as suspected "residual root"[15] or "rhinolith"[16] or "osteoma"[17] or "antrolith"[18] or "calcification within granulation tissue".[19] In other cases, a generic radiopaque mass was described before surgery.[15,16] In particular, the nature of most foreign bodies constituted by zinc-oxide eugenol impression paste was identified after surgical removal, material section, and infra-red spectroscopy or chemical analysis.[14-16,18] The high radiopacity of the alginate allowed an easy identification of a foreign body in the sinus.[17] The presence of foreign body constituted of dental silicone impression material remained largely undetected on X-rays and was identified only after intraoral fibroscopy.[19] In all cases, the differential diagnosis about the nature of the foreign bodies dislocated in the maxillary antrum (i.e. the confirmation that the foreign body is a fragment of dental impression material) was possible only after surgical removal and morphological or laboratory analysis of material fragments.

The examined articles nor reported data about legal actions taken by the patient against dentists, ENT, or other specialists involved in the case neither offered discussion about medicolegal issues possibly connected with similar cases for both the OAC mistreatment, the penetration of the foreign bodies, and the delayed diagnosis of the sinusitis.

Discussion

About 60% of iatrogenic sinusitis derives from dental treatments, out of which at least 45% is due to surgical trauma (post-extraction, sinus lift, or implant surgery), formation of OAC, and subsequent dislocation of foreign bodies inside the maxillary sinus (implants, roots, bone grafts).[1] Felisati *et al*.[20] (2013) reported odontogenic sinusitis as due to dental implant placement in 30% cases, tooth extractions about 20%, and to endodontic procedures for about 15%. Troeltzsch *et al*.[21] (2015) verified that 75% (on overall 174 cases) of symptomatic unilateral sinusitis is due to odontogenic causes, and at least 65% is subsequent to dentoalveolar surgery. An immediate post-extraction OAC occurs in 34.5% of cases, wound healing disturbance after extraction in 13.2%, peri-implantitis in 5.2%, post sinus elevation surgery 2.3%,[21] whilst the penetration into the antrum of foreign bodies as luxated root or endodontic material is limited to 1.7% of cases.[22] The latter incidence differs largely from the occurrence of odontogenic sinusitis due to protrusion penetration of root filling material that Arias-Irimia *et al*.[22] described in 20% of the cases. According to Hara *et al*.[23] (2018), dental roots and implants represent 75% of foreign bodies protruded in maxillary sinus, whilst dental materials retained are mostly endodontic filling materials. The iatrogenic penetration of the antrum is complicated by sinusitis in more than 60% of cases. No differences in the onset symptoms related to the etiology of sinusitis emerged from the literature and the possible odontogenic causes of maxillary sinusitis are ought to be carefully considered especially in unilateral cases.[21] For medicolegal issues, protrusion of teeth, dental materials, or implants in the sinus is often deemed as a consequence of malpractice due to incomplete diagnostic procedures, incorrect treatment planning, or surgical technique.[24-26]

The reviewed literature [Table 1] shows that the penetration of impression material into the maxillary sinus is very rare and it is related to the failure of timely interception and/or incorrect spontaneous healing of the post-surgical OAC, through which the impression

material is thrusted into the antrum.[13,15-18] The onset of sinusitis symptoms can vary from rhinitis, pain, headache, purulent discharge, and fever and can appear from weeks to many years after impressions taking. In some cases, as those reported here, the OAC can be completely closed at the time of oral check-up and the suspicion of iatrogenic sinusitis due to material or foreign body penetrated into the maxillary antrum usually raises solely after sinus radiographic investigations, or fibroscopy, or lastly after the surgery. The X-rays and CT scan investigations are effective in recognizing the presence of foreign bodies if the material is radiopaque such as alginate or zinc oxide eugenol impression paste.[27] However, the nonspecific shape, size, and radiodensity of the dislocated impression material can challenge the diagnosis so that, in some cases, the presence and nature of the foreign body could be identified only after the surgical removal. According to the literature, the impression materials that are currently mostly used in clinical practice include hydrocolloids, silicones, polyethers and polysulfides with different level of radiodensity. Elastomeric materials, especially polyether and silicone groups, are endowed with varying radiodensity, whilst polysulfides, alginate and zinc-oxide pastes have the highest radiopacity.[27–29] Impression materials, such as zinc-oxide eugenol paste or gypsum, are considered outdated and actually used only in very limited cases due to their stiffness.[28] Cameron *et al*.[30] (1996) studied some cases of accidental inspiration of elastomeric materials and reported the difficulty in identifying the presence of most studied materials through a radiodensimetric study.

Deniz (2015) earlier reported a unique case due to silicone impression material protruded into the antrum of a patient affected by mild symptoms and an active OAC.[18] The CT revealed only the discontinuation of antrum floor and partially calcified inflammation material, whilst the elastomeric material was revealed during the sinus surgery, some years after the impressions taking.[18]

Unlike in the previous report, in our own case, no OAC was detected by all the ENT specialists consulted by the patient suffering from long-lasting drug-resistant sinusitis for several years after tooth extraction. The belated diagnosis and surgical intervention were due to both the complete healing of the OAC through which the impression material was initially thrusted into the antrum, and the silicone material radiolucency similar to anatomic structures or surrounding inflammatory tissues that did not allow to detect its presence in maxillary sinus until after surgery.

The complex diagnosis of inflammatory response triggered by retained impression materials have been reported also for other parts of the oral cavity. Ree *et al*.[31] (2001) and Alikhasi *et al*.[32] (2014) described two cases of inflammatory reaction caused by impression material thrusted under the gingiva, respectively a polyether-based paste for a natural tooth and a condensation silicone for a screw implant. In both cases, the radiographic examinations resulted normal and unable to detect the retained material. Roy E. Olson (1968) described the case of a patient who experienced painful swelling resulting from the penetration of elastic impression material into the subperiosteal area of the mandible after a pre-prosthetic dental preparation.[33]

In case of persistent inflammation, such as a mono-lateral sinusitis following dental surgery in upper jaw, the possible presence of a foreign body into the antrum should be carefully considered by dentists or ENT specialists even if an OAC is not actually present. Furthermore, the scarce radiographic evidence should not be regarded as an exclusion criterion since a retained fragment of impression material can have nonspecific shape and radiodensity compared to surrounding structures and inflammatory tissues. The possible iatrogenic cause should be thoroughly investigated by collecting dental data and clinical history dating back also several years. Then an endoscopic investigation is recommendable as unique reliable way to confirm the diagnosis and the presence of foreign bodies in the maxillary antrum.[18]

Beyond the severe clinical complications, a misdiagnosis and improper management of an OAC can imply serious medicolegal and legal consequences for the specialists involved, as for the case reported here. The dentist was sentenced for negligence since a breach of standards of care occurred when the OAC was not evidenced after dental extraction and before the impression taking. The Court deemed the OAC creation an unavoidable complication in some upper molar extractions, but identified the fault of the dentist in the lack of proper cares addressed to detect and treat the iatrogenic oroantral communication.[34,35] Moreover, the dentist's conduct was also disputed for the incomplete patient's record. The compensation awarded to the patient included the physical impairment, sufferings due to the lasting sinusitis, and then the more relevant surgical intervention that the chronic sinusitis required.[36]

Conclusion

Dentists, ENTs, or other medical specialists involved in patients with unilateral chronic maxillary sinusitis drug-resistant should consider the iatrogenic etiology of the inflammation due to a retained foreign body into the maxillary sinus.

Dentists should consider the risks connected with a persistent OAC,[37] among which the possibility that a foreign body can penetrate into the maxillary sinus. Impression materials can be thrusted through an OAC into maxillary sinus and cause intense and drug-resistant sinusitis. In these cases, the diagnosis can be very challenging especially when the OAC is subsequently healed, and the retained material has nonspecific shape or radiodensity compared to the surrounding normal or inflammatory tissues. Beyond the clinical consequences for the patient, failing the appropriate diagnosis of an OAC persistence, which allows the penetration of foreign bodies into the maxillary sinus, can imply serious medicolegal consequences for the dentist or other involved specialists.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Kim SM. Definition and management of odontogenic maxillary sinusitis. Maxillofac Plast Reconstr Surg 2019;41:13.
2. Bernardi S, Scarsella S, Di Fabio D, Oliva A, Di Girolamo M, Continenza MA, *et al*. Giant follicular cysts extended in pterygo-maxillary fossa, antro-naso-ethmoidal and orbital space associated to exophtalmos and diplopia in young patients. Oral Maxillofac Surg Cases 2018;4:17-22.
3. Nimigean VR, Nimigean V, Maru N, Andressakis D, Balatsouras DG, Danielidis V. The maxillary sinus and its endodontic implications: Clinical study and review. B-ENT 2006;2:167-75.
4. Trimarchi M, Vinciguerra A, Galli A, Capparè P, Vinci R, Bussi M. Management of upper odontogenic infections and the role of multidisciplinary treatment. J Osseointegr 2019;11:548-52.
5. Varzhapetyan S. Ultrasound diagnosis of forms iatrogenic maxillary sinusits. Georgian Med News 2017;24-9. Russian.
6. Tanasiewicz M, Bubilek-Bogacz A, Twardawa H, Skucha-Nowak M, Szklarski T. Foreign body of endodontic origin in the maxillary sinus. J Dent Sci 2017;12:296-300.
7. Saruhan N, Kılınç A, Tepecik T, Ertaş Ü. Foreign material in a maxillary sinus as a complication of root canal treatment: A case report. Turkish Endod J 2016;1:96-8.
8. Galindo-Moreno P, Padial-Molina M, Avila G, Rios HF, Hernández-Cortés P, Wang HL. Complications associated with implant migration into the maxillary sinus cavity. Clin Oral Implants Res 2012;23:1152-60.
9. Sahin YF, Muderris T, Bercin S, Sevil E, Kırıs M. Chronic maxillary sinusitis associated with an unusual foreign body: A case report. Case Rep Otolaryngol 2012;2012:903714. doi: 10.1155/2012/903714.
10. Küçükkurt S, Tükel H, Özle M. Removal of displaced metallic foreign bodies from maxillary sinus: Two cases. Ata Diş Hek Fak Derg 2018;28:396-9.
11. Tanna N, Awal D, Eyeson J. An unusual case of Sinusitis – foreign body in the maxillary antrum. Oral Surg 2019;12:118-22.
12. Sugiura T, Yamamoto K, Nakashima C, Murakami K, Matsusue Y, Horita S, *et al*. Chronic maxillary sinusitis caused by denture lining material. Open Dent J 2016;10:261-7.
13. Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D. The CARE Guidelines: Consensus-based clinical case reporting guideline development. Glob Adv Health Med 2013;2:38-43.
14. Shelton DW. Recovery of zinc oxide and eugenol impression paste from the maxillary sinus. Oral Surg Oral Med Oral Pathol 1964;18:126-9.
15. Owen M, Macansh J. Foreign body (impression material) in the maxillary antrum. Clin Radiol 1965;16:284-8.
16. Smith HW, Guttenberg I. Dental impression paste in the maxillary sinus. Arch Otolaryngol 1968;87:174-80.
17. Gümrü OZ. Foreign body (alginate impression paste) in the maxillary sinus: A case report. J Nihon Univ Sch Dent 1990;32:235-9.
18. Rodrigues MT, Munhoz ED, Cardoso CL, de Freitas CA, Damante JH. Chronic maxillary sinusitis associated with dental impression material. Med Oral Patol Oral Cir Bucal 2009;14:E163-6.
19. Deniz Y, Zengin AZ, Karli R. An unusual foreign body in the maxillary sinus: Dental impression material. Niger J Clin Pract 2016;19:298-300.
20. Felisati G, Chiapasco M, Lozza P, Saibene AM, Pipolo C, Zaniboni M, *et al*. Sinonasal complications resulting from dental treatment: Outcome-oriented proposal of classification and surgical protocol. Am J Rhinol Allergy 2013;27:e101-6.
21. Troeltzsch M, Pache C, Troeltzsch M, Kaeppler G, Ehrenfeld M, Otto S, *et al*. Etiology and clinical characteristics of symptomatic unilateral maxillary sinusitis: A review of 174 cases. J Craniomaxillofac Surg 2015;43:1522-9.
22. Arias-Irimia O, Barona-Dorado C, Santos-Marino JA, Martínez-Rodriguez N, Martínez-González JM. Meta-analysis of the etiology of odontogenic maxillary sinusitis. Med Oral Patol Oral Cir Bucal 2010;15:e70-3.
23. Hara Y, Shiratsuchi H, Tamagawa T, Koshi R, Miya C, Nagasaki M, *et al*. A large-scale study of treatment methods for foreign bodies in the maxillary sinus. J Oral Sci 2018;60:321-8.
24. Manea C, Sarafoleanu C. Iatrogenic foreign bodies in the maxillary synus: Between malpraxis and medico-legal consequences. Rom J Leg Med 2015;23:14-8.
25. Pinchi V, Varvara G, Pradella F, Focardi M, Donati MD, Norelli G. Analysis of professional malpractice claims in implant dentistry in Italy from insurance company technical reports, 2006 to 2010. Int J Oral Maxillofac Implants 2014;29:1177-84.
26. Pinchi V, Pradella F, Gasparetto L, Norelli GA. Trends in endodontic claims in Italy. Int Dent J 2013;63:43-8.
27. Elíasson ST, Holte NO. Rubber-base impression material as a foreign body. Report of a case. Oral Surg Oral Med Oral Pathol 1979;48:379-80.
28. Rubel BS. Impression materials: A comparative review of impression materials most commonly used in restorative dentistry. Dent Clin North Am 2007;51:629-42.
29. Parissis N, Iakovidis D, Chirakis S, Tsirlis A. Radiopacity of elastomeric impression materials. Aust Dent J 1994;39:184-7.
30. Cameron SM, Whitlock WL, Tabor MS. Foreign body aspiration in dentistry: A review. J Am Dent Assoc 1996;127:1224-9.
31. Ree MH. An unusual swelling following endodontic and prosthodontic treatment of a mandibular molar due to a foreign body reaction. Int Endod J 2001;34:562-7.
32. Alikhasi M, Soleimani Shayesteh Y, Beyabanaki E, Khojasteh A. A sinus tract following prosthodontic treatment with a dental implant: A case report. J Periodontol Implant Dent 2014;6:64-7.
33. Olson RE. Foreign body removal: Report of case. J Am Dent

Assoc 1968;76:1041-2.
34. Procacci P, Alfonsi F, Tonelli P, Selvaggi F, Menchini Fabris GB, Borgia V, *et al*. Surgical treatment of oroantral communications. J Craniofac Surg 2016;27:1190-6.
35. Belmehdi A, El Harti K. Management of oroantral communication using buccal advanced flap. Pan Afr Med J 2019;34:69.
36. Ferrara SD, Baccino E, Boscolo-Berto R, Comandè G, Domenici R, Hernandez-Cueto C, *et al*. Padova charter on personal injury and damage under civil-tort law: Medico-legal guidelines on methods of ascertainment and criteria of evaluation. Int J Legal Med 2016;130:1-12.
37. Molteni M, Bulfamante AM, Pipolo C, Lozza P, Allevi F, Pisani A, *et al*. Odontogenic sinusitis and sinonasal complications of dental treatments: A retrospective case series of 480 patients with critical assessment of the current classification. Acta Otorhinolaryngol Ital 2020;40:282-9.