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ACCIDENTAL DISPLACEMENT OF DENTAL IMPLANTS INTO THE NASAL CAVITY: A LITERATURE REVIEW

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ABSTRACT

Background: Migration of dental implants into the nasal cavity is a rare but potentially serious complication, which may cause chronic discomfort, pain, recurrent sinus infections, and nasal discharge. Despite the high predictability of implant therapy, displacement into adjacent anatomical structures remains a diagnostic and therapeutic challenge.

Aim: The aim of this review is to present the clinical characteristics of patients with dental implant migration into the nasal cavity, identify potential risk factors, and discuss preventive strategies and treatment options.

Material and Methods: A literature search was conducted in PubMed using the terms: “Dental implants displace and nasal cavity,” “Dental implants,” “migration,” and “nasal cavity.” Titles and abstracts were screened, and full texts were retrieved for relevant articles. Eight articles reporting implant migration into the nasal cavity were included and analyzed for implant localization, symptoms, time to diagnosis, and method of removal.

Results: The keyword “dental implant displaced” yielded 1,181 results, while “nasal cavity” returned 25,526 results. The combined keywords “dental implant” and “nasal cavity” identified 145 publications; after adding the term “migration,” the number of articles was reduced to 12. Following analysis, eight articles addressing implant migration into the nasal cavity were selected.

Conclusions: Although extremely rare, migration of dental implants into the nasal cavity can cause serious clinical consequences. Endoscopic removal is the treatment of choice, allowing safe extraction and concurrent management of mucosal changes. Accurate radiological assessment using CBCT or CT, careful surgical planning, appropriate implant selection, and postoperative monitoring are crucial for prevention and management of this complication.

KEYWORDS

Dental Implants, Nasal Cavity, Implant Migration, Endoscopic Removal

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Abbreviations:

CBCT – cone-beam computed tomography

CT – computed tomography

Introduction and Objective:

Implant therapy is currently regarded as one of the fundamental treatment modalities for tooth loss in modern dentistry, as it overcomes several disadvantages and limitations of traditional prosthetic restorations. Although implant treatment is considered safe and highly predictable, complications may occur, including injury to adjacent neurovascular bundles, infection, migration (i.e., displacement) of the implant into neighboring anatomical spaces, lack of osseointegration, bleeding, and implant instability [1,9].

Implant displacement is considered a rare complication in implantology. The literature describes cases of implant migration into the maxillary, ethmoid, and sphenoid sinuses, as well as into the cranial fossa or orbital floor, whereas migration into the nasal cavity is significantly less common [2–6]. Several reports describe implants perforating into the maxillary sinus and subsequently migrating into the nasal cavity [2,4,5,7,9,10]. According to the authors' current knowledge, only three cases of direct implant perforation into the nasal cavity have been reported in the literature, highlighting the rarity of this complication [6,8,9].

Implant displacement may have dramatic consequences, potentially damaging vital structures and causing serious or even life-threatening injuries. Therefore, precise localization of displaced implants is crucial for their safe and prompt removal [2]. Given the complex anatomy of the paranasal sinuses and nasal cavity, conventional radiographic methods are often insufficient for accurate implant localization, necessitating the use of advanced imaging techniques. In order to properly interpret such imaging requires clinical experience and great familiarity with similar cases in implantological practice [2].

The aim of this review is to present the clinical features of patients with implant migration into the nasal cavity, identify potential risk factors, and discuss preventive measures and therapeutic strategies.

Authors	Cases/number of implants	Localization	Symptom	Time of detection	Removal technique
Yaser Safi et al. 2022	1	middle nasal meatus	—	3 months	trans-nasal endoscopy
Van der Loo Sander et al. 2013	1	inferior nasal meatus	sinusitis	7 years	spontaneously expulsion
Jose-Maria Sanchis, Jose-Maria Diaz 2021	1	inferior nasal meatus	nasal discomfort	1 year	spontaneously expulsion
Ana Sousa Menezes et al. 2019	1	nasal septum	nasal pain	1 week	trans-nasal endoscopy
Schichang Li et al. 2020	1	between middle nasal concha and the nasal septum	nasal odor	9 months	trans-nasal endoscopy
Han-Gyeol Yeom et al. 2023	3	inferior nasal meatus	—	—	trans-nasal endoscopy
Anne-Kathrin Bar et al. 2024	1	nasal septum	—	0 days	trans-nasal endoscopy
Antonio Scarano et al. 2022	1	middle nasal concha	—	10 years	ingestion

Discussion:

Etiology and Risk factors

There are multiple potential causes of dental implant migration into the nasal cavity. Direct displacement may occur during implant placement due to insufficient surgical experience, inadequate treatment planning, excessive force, anatomical factors such as bone atrophy or resorption resulting from inflammatory or infectious processes, aging, prior radiotherapy, bisphosphonate therapy, untreated perforation of the Schneiderian membrane, or premature or inappropriate prosthetic loading [2–7,9].

The migration of a dental implant from the maxillary sinus into the nasal cavity after several years can be explained by the presence of cilia on the pseudostratified ciliated columnar epithelium of the Schneiderian membrane lining the maxillary sinus. Ciliary movement and head movements gradually shift the implant toward the sinus ostium, potentially leading to migration into the inferior nasal meatus or adjacent structures over time [2,3,7,9].

In the reviewed cases, implant migration most commonly occurred into the inferior nasal meatus [4,5,8]. Only two cases involved direct placement of the implant within the nasal septum [6,9]. Other reports described migration into the middle nasal meatus, middle turbinate, or the space between the middle turbinate and the nasal septum [2,7,10].

Clinical Presentation

The accidental migration of dental implants into the nasal cavity may result in symptoms such as chronic recurrent sinusitis, nasal discomfort or pain, and foul nasal odor [4–7]. Furthermore, some cases were associated with fungal infections and, in rare instances, neoplastic changes [7]. In asymptomatic patients or cases lacking symptom data, the absence of symptoms may be caused by short duration of implant presence within the nasal cavity. However, prolonged retention of a displaced implant, may lead to chronic inflammation, erosion of surrounding anatomical structures, and further migration into adjacent spaces [7].

Epidemiology:

Although implant therapy is more frequently performed in women, available literature suggests a higher incidence of this complication in men; however, this conclusion is unreliable due to the limited number of reported cases [2].

Diagnostic Considerations

Prior to implant removal, urgent radiological examination is essential. To accurately localize the implant and select the least invasive therapeutic approach, three-dimensional imaging modalities such as CBCT or CT are recommended. Therefore the panoramic radiography alone is insufficient due to its two-dimensional nature and superimposition of anatomical structures, including the nasal cavity and maxillary sinus [8]. Three-dimensional imaging eliminates structural overlap and enables precise assessment of the implant's relationship to the nasal cavity and maxillary sinus [8].

Imaging should be performed immediately before planned implant removal, as delayed intervention may increase the risk of further migration [2]. In cases reported by Anne-Kathrin Bar et al., delayed removal due to patient refusal resulted in unnoticed implant migration, prolonged treatment time, additional symptoms, and the need for surgical intervention that could have been avoided [8].

Treatment approaches

In most cases, endoscopic removal was the treatment of choice; however, spontaneous expulsion occurred in three cases [4,5,10]. In the study by Antonio Scarano et al., the implant entered the gastrointestinal tract and was swallowed, while in reports by van der Loo et al. and Sanchis and Díaz, the implant was accidentally expelled through the nostrils. Sousa Menezes et al. described a case in which implant migration into the nasal septum led to septal abscess formation, which was successfully treated with endoscopic foreign body removal and abscess drainage.

Endoscopic implant removal has gained popularity due to its low complication rate, rapid recovery, as well as the ability to simultaneously treat pathological changes in adjacent paranasal sinuses [3]. Compared to other approaches, endoscopic removal through the nasal cavity not only allows to safely extract foreign bodies, but also manages concurrent treatment of mucosal pathologies, such as hypertrophy, hyperplasia, or infections. This procedure is minimally invasive and is often performed under local anesthesia with sedation, reducing treatment and recovery time [3].

However, as noted by Anne-Kathrin Bar et al., this technique may be limited because of the size of the implant and location, in addition to this it carries a risk of complications [8]. Alternative approaches, such as transoral access including the Caldwell–Luc procedure or lateral window technique, are typically indicated for intraoperative displacement, incomplete healing, or when simultaneous implant removal and sinus augmentation are planned [8]. These methods should be considered when the foreign body is large or cannot be removed endoscopically.

Preventive Strategies

To prevent complications in implant patients, thorough clinical and radiological assessment is essential. In cases of insufficient bone volume for stable implant placement, sinus floor augmentation using bone grafts may effectively improve bone quality and quantity [3]. Successful outcomes of endosseous implants require appropriate implant length and diameter selection, meticulous surgical planning, proper surgical techniques, and careful postoperative monitoring.

Summary

Although migration of dental implants into the nasal cavity is an extremely rare complication, it may lead to serious clinical consequences such as chronic inflammation, pain, discomfort, and damage to surrounding anatomical structures. The reviewed literature indicates that endoscopic implant removal remains the treatment of choice, allowing simultaneous correction of mucosal pathology and reduced recovery time. In cases where implant size or location precludes endoscopic access, transoral approaches such as the Caldwell–Luc or lateral window techniques may be necessary.

In order to conduct safe treatment it is crucial to provide accurate radiological assessment, including mandatory three-dimensional imaging (CBCT or CT) both before implant placement and prior to removal if displacement occurs. This approach enables to determine precise localization, minimizes complication risk, and supports optimal surgical planning. What is more essential to reduce the risk of migration and other implant-related complications is appropriate implant selection, surgical technique, and patient monitoring after the treatment. These findings underscore the importance of an interdisciplinary approach combining implantology, maxillofacial surgery, and radiology to ensure patient safety and treatment efficacy.

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