UNVEILING THE DENTAL CONNECTION: A CASE REPORT OF ODONTOGENIC INITIATING CHRONIC SUPPURATIVE OTITIS MEDIA

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ABSTRACT

Chronic suppurative otitis media (CSOM) is a troubling condition that encompasses a range of factors contributing to its etiology. In this context, we present an intriguing and atypical case that adds a novel dimension to the understanding of CSOM. This particular case is marked by its prolonged and treatment-resistant nature, defying conventional medical treatments and prompting us to explore less common etiological pathways. Our case, however, deviates from the norm. It presents a conundrum that led us to investigate an alternative and less explored avenue. During our comprehensive diagnostic evaluation, our attention was drawn to the possibility of a hematogenic infection that may have originated from dental caries. This scenario emerged as the primary candidate for the source of the patient's chronic suppurative otitis media. This intriguing case represents a unique instance of a hematogenic infection stemming from dental caries. The hematogenic pathway, while previously considered uncommon, may be the precipitating factor behind the development of chronic suppurative otitis media in this patient. This perspective widens our understanding of the various potential etiological factors contributing to CSOM and highlights the importance of considering less conventional sources of infection. In the context of otologic disorders, the case we present underscores the necessity of a thorough and holistic diagnostic approach, acknowledging that the origins of such conditions can often be multifaceted and not limited to the conventional causes. Furthermore, this case serves as a reminder for clinicians to maintain a high level of suspicion for atypical etiological pathways when faced with treatment-resistant and persistent manifestations of CSOM.

Keywords: Chronic Suppurative Otitis Media, Dental Caries, Odontogenic, Hematogenic

INTRODUCTION

Individuals afflicted with chronic suppurative otitis media (CSOM) exhibit a clinical condition typified by tympanic membrane (TM) perforation, coupled with recurrent or persistent purulent discharge that extends beyond a six-week timeframe. On a global scale, the incidence of CSOM averages approximately 4.8 new cases per 1,000 individuals across all age groups annually.(Head et al., 2020; Schilder et al., 2016) The initial therapeutic strategy frequently involves the use of ototopical quinolones, in combination with aural hygiene measures, often resulting in favorable outcomes. Nevertheless, when these primary interventions prove ineffective, systemic antibiotics are considered as an alternative.(Appanaitis, Lambert, Schwarz, Lasarev, & Watson, 2020; Kashyap et al., 2018)

Nonetheless, cases of treatment-resistant CSOM, unresponsive to appropriate medical interventions, may indicate the presence of concealed foci of bacterial infection or biofilm formation. In our case, potential sources of bacterial contamination may include hematogenic infections originating from infected dental caries. While prior medical literature has documented cases where sinus disorders have led to otitis or dental conditions have resulted in sinusitis, our presentation here represents the first documented case of odontogenic CSOM related to a hematogenic infection, shedding light on a novel etiological pathway within the field of otological disorders.(Nelson, Nechvatal, Weber, & Canion, 2005)

LITERATURE REVIEW

Otitis media is a prevalent cause of fever in the pediatric population. Chronic suppurative otitis media, also known as chronic otitis media, represents an advanced stage of ear disease characterized by ongoing chronic infection of the middle ear without an intact tympanic membrane. This condition entails a chronic inflammatory process affecting the middle ear and mastoid cavity. The hallmark symptom is persistent otorrhoea lasting 2 to 6 weeks via a perforated tympanic membrane. Notably, dysfunction of the Eustachian tube is a prevailing factor, observed in 70% of patients requiring middle ear surgery. When Eustachian tube dysfunction occurs, it disrupts pressure equalization in the middle ear and compromises middle ear aeration, leading to the classic symptoms of chronic suppurative otitis media. Patients with this condition often experience acquired hearing loss, which, if left untreated, can result in further health complications and potential mortality.(Mittal et al., 2015; Vâță et al., 2023)

Dental caries is a term encompassing both the disease itself and the resulting dental lesion. The caries process primarily takes place within the biofilm, which remains perpetually active and responsive to pH fluctuations. The manifestation of dental caries occurs in the hard dental tissues. Dental caries occurs when the microbiota within the oral cavity, which typically maintains a state of equilibrium, shifts towards an acidogenic, aciduric, and cariogenic population due to frequent sugar consumption. This shift can result in either clinically imperceptible changes or a net loss of minerals within the tooth's hard structures, leading to the formation

of visible carious lesions. In essence, dental caries, as a process, can exist independently of the presence of visible carious lesions. Consequently, dental caries is regarded as a dietary-microbial disease, necessitating the presence of a cariogenic biofilm and regular exposure to fermentable carbohydrates (such as glucose, fructose, maltose, and sucrose) from the diet. Additionally, behavioral, psychological, and social factors play a significant role in the disease progression. The preventive role of fluoride in caries development is well-established, and insufficient fluoride exposure should be considered as a contributing factor in the disease process.(Appanaitis et al., 2020; Kashyap et al., 2018)

CASE REPORT

A 66-year-old female patient presented with an intermittent complaint of discharge from her right ear over the past three months. The initial complaint was characterized by ear pain and bilateral ear discharge three months ago. The discharge was thick, white, and had an odor. She also reported a reduction in her hearing ability and experienced a 'rumbling' sensation in her right ear, especially when exposed to mechanical sounds. Although she had previously experienced ear pain in both ears three months ago, the symptoms in her left ear have since diminished.

The patient had made repeated visits to seek medical attention and had been prescribed ear drops by a physician. These drops provided temporary relief from her symptoms, only for them to recur shortly afterward. Upon physical examination, it was observed that the patient had purulent secretions and a subtotal perforation of the tympanic membrane in her right ear, as shown in Figure 1. This was accompanied by an absent light reflex and lateralization of the Webber test to the right ear. In her left ear, the tympanic membrane appeared to be in good condition but slightly thinner, and it was noted that the patient had experienced a prior perforation in the left ear as well, which had previously caused discharge but had since improved. It's worth noting that the patient had been intermittently experiencing upper right molar pain over the past four months.

Figure 1. Subtotal Perforated Tympanic Membrane with Purulent Ear Discharge (right ear) and Healed Central Perforation (left ear)

DISCUSSION

This case study delves into the clinical scenario of a patient afflicted with chronic suppurative otitis media (CSOM), who initially exhibited a robust response to topical antibiotics. However, a swift resurgence of the condition followed the discontinuation of treatment. Subsequent investigations aimed at identifying the remote origins of middle ear infection unveiled the presence of an infected molar caries. Consequently, the remediation of the dental issue led to a sustained resolution of the patient's CSOM.(Puglisi et al., 2011; Saafan, Ibrahim, & Tomoum, 2013) CSOM typically stems from various contributing factors, including the persistence of acute otitis media, eustachian tube dysfunction, and the presence of cholesteatoma within the middle ear. Chronic perforations of the tympanic membrane create a conduit for contaminants from the ear canal or the eustachian tube, attributed to the loss of the protective "middle ear cushion." In such instances, tympanoplasty often stands as the recommended intervention for the management of ear drainage.(Madana, Yolmo, Kalaiarasi, Gopalakrishnan, & Sujatha, 2011; Mittal et al., 2015)

This particular case showcases a unique characteristic in which clinical improvement was observed between episodes. This prompted a hypothesis that the recurrent nature of the condition may be underpinned by a latent middle ear infection, the presence of cholesteatoma, or the recurrent ascent of bacteria through the eustachian tube, possibly associated with hematogenic infection originating from infected dental caries.(Macfadyen, Acuin, & Gamble, 2005; Monasta et al., 2012) The etiological relationship between CSOM and dental caries, particularly in the context of hematogenic infection, remains a relatively unexplored avenue in existing literature. While prior reports have hinted at a modest association between ear infections and dental caries, this case offers additional evidence to substantiate such a connection, emphasizing the need for further investigation in this area.(Morris, 2012; Vâţă et al., 2023) Furthermore, it underscores the importance of considering non-otological factors when dealing with unresolved cases characterized by atypical disease trajectories or unclear etiologies. Ultimately, this case serves as a poignant reminder of the significance of adopting a comprehensive, patient-centered approach and maintaining a broad differential when addressing complex and persistent medical conditions.(Esra, Banu, & Erdinc, 2013; Schartz, Polacco, Holmgren, & McCool, 2019)

CONCLUSION

In the case described, a unique characteristic is evident, where clinical improvement occurs between specific episodes. This has led to a hypothesis that the recurring nature of this condition may be rooted in a latent middle ear infection, the presence of cholesteatoma, or the repeated ascent of bacteria through the eustachian tube, possibly associated with hematogenic infection originating from infected dental caries. The etiological relationship between CSOM and dental caries, especially within the context of hematogenic infection, remains a relatively unexplored path in the existing literature. While previous reports have provided hints of a modest association between ear infections and dental caries, this

case offers additional evidence to support such a connection, emphasizing the need for further research in this domain. Furthermore, it underscores the significance of considering non-otological factors when confronting unresolved cases marked by unusual disease progressions or unclear etiologies. This case serves as a potent reminder of the importance of adopting a comprehensive patient-centered approach and maintaining a broad differential when addressing complex and persistent medical conditions. As such, it is expected that knowledge regarding the interplay between CSOM and dental caries, particularly in the context of hematogenic infection, will continue to evolve and assist in guiding the management of similar cases in the future.

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