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Barodontalgia:- Revealing the Unreveaing

Aravindha Babu.N, Sudakshina Mukherjee[2], N. Anitha[3], K.M.K.Masthan[4]

[1]Professor, [2]Post graduate Student, [3]Reader, [4]Professor and Head of the Department, Department of Oral pathology and Microbiology, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research

Abstract

Barodontalgia is a pain due to pressure difference. Here in this review article, pathophysiology, manifestation, associated conditions and treatment guidelines of this rare symptom have been discussed. It is often a flare up of preexisting sub clinical oral diseases. Deep sea divers, air crew members especially of fighter jets often suffer from these due to frequent altitude difference and with it the pressure difference. This often pose a great challenge to dental surgeons who sometimes fail to found the exact ill tooth of problem so management becomes problematic.

Keywords : *barodontalgia, diving, toothache*

Introduction

"BARO" means pressure

"DONTALGIA" is Dental pain.

By the name itself it is suggestive of dental pain due to pressure. This barodontalgia was first called as 'aerodontalgia' when in World War II, Tooth pain was experienced by air crew during flight. But later this toothache was also observed in scuba divers, so a more appropiate term BARODONTALGIA being given which abides by the Boyle's Law that correctively state that a given temperature the volume of gas is inversely proportional to ambient pressure[1]. barodontalgia also defined as an oral pain caused by change in barometric pressure in an otherwise asymptomatic organ [2]. In addition to changes in ambient pressure, further physiological and metabolic changes in human body occurs.

CLASSIFICATION ACCORDING TO Ferjentsik and Aker [3]

CLASS CAUSE SYMPTOMS

Class-I Irreversible pulpitis Sharp pain on onset

Class-II Reversible pulpitis Dull pain on ascent

Class-III Necrotic pulp Dull pain on descent

Class-IV Periapical Pathology Severe persistent pain on ascent or

Descent

PATHOPHYSIOLOGY

Three hypothesis was proposed by Kollman [4]

A) Expansion of trapped air bubbles under a root filling or against dentin that activated nociceptors

B) Stimulation of nociceptors in maxillary sinus with the pain referred to teeth

C) Stimulation of nerve endings in a chronically inflamed pulp.

Among these last two were strongly supported with histological evidences.

BARODONTALGIA IN DIFFERENT SCENARIOS

1) IN PILOTS

Barodontalgia has been reported to occur during flying in range of 5000-35000 feet but more commonly reported between 9000-27000 feet[5]. Barodontalgia mainly occurs when the pulp chamber of tooth fails to adjust its internal pressure with decreasing outer pressure in high altitudes.

2) IN DIVERS

Pain due to pressure difference occur more in maxillary teeth than mandibular teeth [6] and majority occurs while descending [7]. since, SCUBA I.e Self Contained Underwater Breathing Apparatus diving is one of the popular sports. Dentists should be aware of dental related problem arising from it. The pain mainly occurs when the diver descends and pain experienced according to divers depth. As he descends air is forced into the pulp due to increased pressure of inspired air. Compressed air reaches dentinal tubules through primary, secondary, or recurrent caries along the margins of restorations or leaking restorations[8]

BAROTRAUMA OF ASCENT :- Caused by expansion of the compressed air within pulp chamber as diver ascends. This kind of injury generally seen in tooth with incomplete RCT or faulty restorations[9]. As the divers depth diminishes, expansion of trapped air leads to severe pain and sometimes may lead to fracture[10]. In severe cases the pressure built up inside the tooth chamber causes explosion of tooth called odontecrexis.

Diagnosis

Barodontalgia is rather a symptom than a pathological condition itself. Oral pathologies considered associated with Barodontalgia are- dental Caries, Defective tooth restorations, pulpitis, pulp necrosis, periodontal pockets, impacted teeth [11,12]. But till date studies prove often difficulties are faced by dental surgeons to obtain a definitive diagnosisof the causative factor[13,3],due to the fact there is need to identify the offending tooth which could be any teeth having above conditions. Moreover dentists cannot reproduce the pressure difference to identify the required tooth with ordinary dental facilities[14]. So history regarding recent dental treatments, symptoms like swelling, sensitivity to cold, onset & nature of pain, can sometimes guide the practitioner to the offending tooth.

Differential Diagnosis :

Facial Barotraumas can be of following four types

A) Barotitis media (middle ear barotrauma) : Traumatic inflammation of middle ear due to pressure difference between air in tympanic cavity and that of surrounding atmosphere.

B) External otitic barotrauma : Injury to lining mucosa due to air tight space between an object in outer ear canal and eardrum.

C) sinuses due to pressure difference.

D) Dental Barotrauma

So, Referred pain from these above barotraumas can manifest as toothache.

In these above conditions Barodontalgia is not a symptom of a preexisting disease but a pressure induced pathologic conditions.

Prevention & Treatment Plan :

Barodontalgia is rare. Most dentists are not aware of it, yet it can become a risk factor to divers, submariners, pilots and airline passengers. So FDI (Federation Dentaire Internationale) recommended annual check up for divers, submariners and pilots with oral hygiene instruction from dentist [15]. So, while examining patients attached with these kind of jobs attention should be given in the presence of areas of dentin exposure, caries, fractured cusps, defective fitting, periapical pathology if any. Patients coming with complaints of pain if suspected barodontalgia, thorough examination including the age of restoration, screening for caries and quality of restoration should be ensured and also history regarding his recent activity that could involve pressure difference should be checked.

Treatment [16]

1) Placement of Zinc Oxide Eugenol base found to be beneficial in reversible pulpitis cases.

2) Generally in suspected barodontalgia cases pulp capping is not recommended instead endodontic treatment is indicated.

3) Recent Studies have been shown variation in pressure changes affect the retention of crown cemented with zinc phosphate and Glass Ionomer Cement. So dental surgeons should consider cementing fixed prosthesis with resin cements for patients who are exposed to marked variation in environmental pressure.

4) Reports presented of shattering porcelain crown or explosion of temporary sealing in Root Canal Treated

teeth in diving and submariners. So, dentists should keep in mind while treating these patients.

5) Sometimes if dentists fail to complete the conservative treatment before deep sea diving or flight then extraction should be the treatment of choice.

6) Removable dentures not recommended in these patients.

Discussions

The article reviewed the fact about barodontalgia. Though this is a condition which is being neglected greatly and many are unaware of the facts and its severe consequences. Dentists should be more known to the ill effects and diagnosis of barodontalgia and pay more importance in the profession of the patients and to their state of living. Dentists should implement the discussed treatment protocol in treating patients risk of getting barodontalgia.

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