

Chemotherapy-Treated Children's Delayed Dental Effects: A Case Study

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Abstract

Hemotherapy may mainly affect teeth such as microdontia, hypoplasia and Angular roots.

The age at diagnosis and the type of chemotherapeutic agent used influence the frequency and severity of dental abnormalities. As a result, it is critical for pediatric and general dentists to be aware of the long-term side effects of cancer treatment on children, particularly in the oral cavity. This article plans to record a case outlining different dental irregularities optional to chemotherapy in 20 years of age kid who had a background marked by chemotherapy in youth.

The bacterium *Treponema pallidum* is the cause of the infectious disease syphilis. There are three clinical stages of syphilis, and the secondary stage is typically characterized by a variety of oral manifestations. The sickness mirrors other more normal oral mucosa injuries, going undiscovered and with no legitimate therapy. Syphilis remains a global public health issue despite medical advancements in its prevention, diagnosis, and treatment. As a result, dental surgeons should be able to identify the disease's most common oral manifestations, highlighting their role in both diagnosis and prevention. Seven patients with secondary syphilis who presented with various oral manifestations are the subject of this case series.

Keywords: Case report; Chemotherapy; Hodgkin; *Treponema pallidum*

Introduction

Syphilis, an infectious disease brought on by the bacterium *Treponema pallidum*, has so far only been found in humans as the only natural host. This microorganism has a positive tropism for a few human organs and tissues, with complex clinical ramifications. Although the genital organs are the primary inoculation site, extragenital areas like the oral cavity and the anal region are also affected. Transmission occurs primarily through unprotected sexual activity. The intra-uterine (transplacental) route during labor, which leads to congenital syphilis, is another important transmission route[1-4].

Syphilis has three clinical stages. The primary stage is characterized by a single chancre that develops 90 days after exposure and disappears on its own within two to eight weeks. A rash on several parts of the skin develops during the secondary stage, which takes place between two and twelve weeks after exposure. When the condition reaches its latent stage, the rash disappears without treatment.

The gummata and/or neurosyphilis that appear three years or more after exposure are characteristic of the tertiary stage, which is also known as the late phase and is rarely observed today.

Multiple painless aphthous ulcers or irregularly shaped lesions with whitish edges distributed on the oral mucosa and oropharynx, particularly on the tongue, lips, and jugal mucosa, are the most common oral manifestations of syphilis at the secondary stage of the disease. Although oral manifestations of syphilis may be observed at the primary stage, they are more common at the secondary stage. The presence of such sores fluctuates broadly, in this way expanding the demonstrative intricacy when the dental specialist isn't as expected able to distinguish stomatological conditions. Thus, oral appearances of syphilis might be confused with other, more normal oral circumstances, with no early finding or fitting treatment. Cancer is the second leading cause of death among children worldwide[5-9].

The endurance paces of patients experiencing youth malignant growths have improved decisively with the appearance of chemotherapy, with endurance paces of life as a youngster tumors revealed at 70%-75%

in certain pieces of Europe and North America. However, children who receive antineoplastic treatment experience a number of long-term side effects in a variety of organs and systems, including oral complications. Dental anomalies are the most incessant and long haul results of young life disease treatment; these irregularities incorporate microdontia, hypodontia, shortening of roots, modified ejection designs, coronal hypocalcification, early apical conclusion, and a higher occurrence of caries.

The age at diagnosis, the type of chemotherapeutic agent used, and the duration of antineoplastic treatment all have an impact on the frequency and severity of dental abnormalities. Younger children who receive treatment appear to be more severely affected than older ones.

These irregularities, albeit not dangerous, may have significant ramifications for these youngsters, like tasteful, utilitarian, and occlusal unsettling influences, and can likewise influence facial turn of events, therefore affecting personal satisfaction.

This article plans to record a case representing different dental peculiarities optional to chemotherapy in 20 years of age kid who had a past filled with chemotherapy in youth.

This case report has been accounted for in accordance with the Alarm Measures.

Presentation of a case

A 20-year-old boy presented to Rabat's center for consultations and dental treatments with pain in his right maxillary roots and a desire to

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recover his oral cavity.

The child appeared to be older than he actually was from his appearance. Following the diagnosis of Hodgkin's disease at the age of 6, the patient had undergone chemotherapy, according to the medical record. After this enemy of disease treatment, the patient has been going for a customary check-ups and has been generally liberated from any side effects[10].

An ogival palate, numerous harmful lesions, and unsatisfactory overall hygiene were discovered during an intraoral examination. Also inflamed was the gingiva. In order to get a general picture of the dental and periodontal structures, a panoramic X-ray was taken. It revealed some dental anomalies, particularly the short roots of the second permanent mandibular molars and the sharp apex of all mandibular premolars. Additionally, it displayed tiny wisdom teeth. The teeth 16 and 26 were extracted, and carious lesions were planned for treatment. The patient was encouraged to keep up with legitimate oral cleanliness by brushing two times every day and to return for intermittent oral tests[11-13].

Analytical discussion

Chemotherapy for children's cancers can result in significant side effects. Dental anomalies are among the most well-known and late impacts of hostile to neoplastic treatment.

Vinblastine, doxorubicin, and cyclophosphamide, the majority of anti-neoplastic medications used to treat cancer in children, disrupt tooth eruption and development due to their cytostatic and cytotoxic effects on cells involved in odontogenesis.

Abnormalities in number (hypodontia), shape (microdontia, macrodontia, and microdontia), enamel defects (discolorations and hypoplasia), root formation disorders (blunt root, tapering root, and delayed root development), and dental development delay or retained teeth are examples of dental changes.

The seriousness of these impacts on dentofacial structures was viewed as connected with the phase of odontogenesis, age at finding, and sort of treatment performed. The most severe dental defects were found in children treated before the age of five, indicating that immature teeth were more susceptible to developmental issues than mature teeth[14].

One of the most common changes found in long-term childhood cancer survivors is microdontia. According to Hölttä et al., a number of studies, the prevalence of microdontia ranged from 7% to 78%. found this rate as 75% in youngsters more youthful than 3 years, 60% in those between the ages of 3 and 5 years, and 13% in those more established than 5 years. Proc and co. stated that the first and second premolars were the most common sites of microdontia in children whose treatments began at less than 30 months of age.

For antineoplastic treatment to bring about dental agenesis, it should obliterate the phones customized to frame a tooth or to influence the flagging frameworks between the tissues in a tooth bud and forestall calcification. A few examinations have detailed a predominance of hypodontia related with anticancer treatment going from 6 to 44%.

Root development is disrupted as a result of cancer treatment in the later stages of tooth formation. Panoramic radiographs show the first signs of root development in permanent teeth between the ages of 3 (for central incisors and permanent first molars) and 7.5 (for permanent second molars). Root formation is complete when the tooth has erupted into the oral cavity. Changes in odontoblast action brought

about by unusual secretory working of the dentin microtubules and complex changes in between and intracellular connections can create abbreviated, tightened, Angular roots and dulled roots[15].

For the situation announced, the oddity that was most noticed was microdontia of the third mandibular molars and short underlying foundations of mandibular second molars and premolars with 'angular underlying foundations of first and second premolars.

One more dental abnormality that is habitually identified in these patients is microdontia, which is described by an amplified mash chamber, apical removal of the pulpal floor, and no narrowing at the level of the cemento-enamel intersection, which is prompted by the disappointment of Hertwig's epithelial sheath stomach to invaginate at the legitimate even level. This irregularity generally influences super durable molar teeth, however it can likewise be seen in premolars and essential molar teeth and can turn into a test when endodontic treatment is required, especially due to its life systems. The patient who was reported did not experience this.

Usually unnoticeable, these dental sequelae are discovered during routine radiological examinations. Unfortunately, the aforementioned issues cannot be fixed. They have a significant impact because they can result in tooth movement and spacing, which compromises the patient's aesthetic and functional appearance as well as their quality of life.

We discovered that the majority of the teeth that were still developing when the oncological treatment began had abnormalities, including the second mandibular molars and mandibular premolars in the present case. The patient had begun chemotherapy at the age of six.

In terms of symptoms, this clinical case is comparable to other cases in the literature[16].

It demonstrates that immature teeth were more susceptible to developmental disruptions than mature teeth, and it confirms that the majority of children treated before the age of five had the most severe dental defects.

Dental math an instrument for indicative data

The earliest proof of dental math as a potential demonstrative device traces all the way back to 1975 when interestingly, plant phytoliths were removed from creature teeth to comprehend the old eating regimen examples of creatures. Numerous scientists concentrated on dental analytics in its demineralized structure from antiquated living things and saw that there were protected mineralized food particles inside the math. Based on observations made with a scanning electron microscope, they came from the same group of researchers who discovered that microorganisms are also maintained within the matrix of calculus. The microorganisms were also observed to be maintained within the calculus matrix by the same group of researchers. Numerous subsequent investigations replicated these findings. Using immunohistochemistry and microscopy, Linossier, Gajardo, and Olavarria discovered a variety of ancient oral bacteria that were preserved in the dental calculus. However, they were unable to demonstrate DNA's viability or intactness. After the development of improvised technologies like transmission electron microscopy with gold-labeled antibodies, High-throughput sequencing (HTS) technology has made it possible to recover millions of DNA fragments from thousands of different microorganisms from the mineralized deposit, proving that microbial DNA could have survived in archaeological material.

Microbiological investigation

Before seeding, 1 mL of sterile saline solution (0.85% NaCl) was

added to the Eppendorff tubes containing the dentin samples.

According to Lamey et al.²⁵, the growth of the specimens collected from dental caries was classified as absent (0 colonies), very sparse (10 colonies), sparse (10-102 colonies), moderate (102-103 colonies), or numerous (>103 colonies) according to Hossain et al.¹⁵ Colonies with different colors were analyzed by using biochemical tests for sugar assimilation and fermentation according to the API Candida 20C system (Biomerieux, Marcy L

Conclusion

Chemotherapy-treated pediatric patients frequently have abnormal teeth. As a result, it is critical for pediatric and general dentists to be aware of the long-term side effects of cancer treatment on children, particularly in the oral cavity. A thorough dental consultation with a clinical and radiological assessment ought to be given to these patients. This will make it possible to find abnormalities in clinical and radiological findings as a result of the anti-cancer treatment, as well as to keep an eye on oral infections and dental procedures that might make the treatment more difficult. This will raise the standard of living for this growing number of children.

Notwithstanding the advances in medication toward the counteraction and early determination and treatment of syphilis, the sickness stays a general medical issue around the world. Concern should be raised because of the rising incidence of the disease in immunocompromised individuals, which suggests that safe sex practices to prevent STDs are not being followed. Primary syphilis has been linked to oral sex and can be seen in the mouth. The secondary stage of the disease manifests in a variety of oral manifestations, mimicking other more common oral lesions, goes unnoticed, and as a result, remains untreated. A patient's clinical history, physical examination, and serological tests typically yield a definitive diagnosis of the disease; a biopsy is typically not necessary as an initial diagnostic tool. As a result, the dental surgeon should be aware of the most common signs and symptoms of syphilis in the oral mucosa in order to assist in both the diagnosis and treatment of the disease.

It not exclusively will give understanding into SARS CoV 2 and its development yet in addition will effectively concentrate on the infection connections in co-inhabitation with the oral and periodontal microflora according to a more extensive viewpoint. The authors stress the significance of dental calculus as a unique substrate and the need for additional research in this area, which will make it possible to directly examine the oral microbiome, including SARS CoV 2. Our existing knowledge and comprehension of the microbial presence, evolution, and interactions with other microbes and hosts will be enhanced by this novel diagnostic strategy that makes use of dental calculus. It may pave the way for the development of improvised diagnostic and therapeutic tools for better patient. Management outcomes, early diagnosis, and prevention strategies.

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Conflict of Interest

None

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