Disturbances in Dental Maturation and Morphologies Caused by Anti-Cancer Therapy

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Introduction

Acute Lymphoblastic Leukemia (ALL) is a hematologic malignancy that is rapid in growth. ALL commonly affects children - accounting for about 25% of childhood cancers. ALL can present systemically as fever, fatigue, bone pain, and swollen lymph nodes. It can manifest orally as bleeding from gingiva, hyperplasia, and opportunistic infections. Treatment commonly includes chemotherapy, radiation therapy, and bone marrow transplants. Anti-cancer drugs are successful by inhibiting growth of cancer cells with cytostatic and cytotoxic effects. Unfortunately, these cells can disturb normal growth of non-cancerous cells as well – including disturbances of dental development. Common dental abnormalities that result include microdontia, hypodontia, root malformations, enamel defects, and hyperdontia. This presentation discusses an 11-year-old female patient with a history of ALL and chemotherapy/radiation therapy at age 6. This patient presented with over-retained primary teeth due to generalized microdontia in her permanent dentition. This presentation explores the diagnosis of dental anomalies after anti-cancer treatment.

Clinical Presentation

An 11-year-old female patient presented to UH Pediatric Dental Clinic for a consult in April 2023. The patient's mother was concerned about "extra" teeth and generalized staining. Patient has a medical history of ALL and g-tube. The patient received treatment - including chemotherapy and radiation – for her ALL diagnosis at age 6 and had been in remission for the two years prior to presenting in the clinic. The patient was very anxious and nervous about dental care. A limited exam revealed severe crowding, over-retained primary teeth, and poor oral hygiene. Patient was unable to tolerate intraoral radiographs, therefore a panoramic radiograph was taken. The panoramic revealed mixed dentition, no missing/extra teeth noted – however, #1, 2, 4, 5, 7, 10, 13, 15, 16, 17, 18, 20, 22, 27, 28, 29, 31, and 32 appear to be microdonts. Due to patient's medical history and anxiety, patient was referred to Rainbow Babies and Children's Hospital for GA to obtain intraoral radiographs to evaluate treatment needed, as well as provide a thorough cleaning. The craniofacial department was also contacted for a consult prior to the GA appointment.

Radiographic/Clinical Findings

Fig 1. Panoramic radiograph taken 04/2023

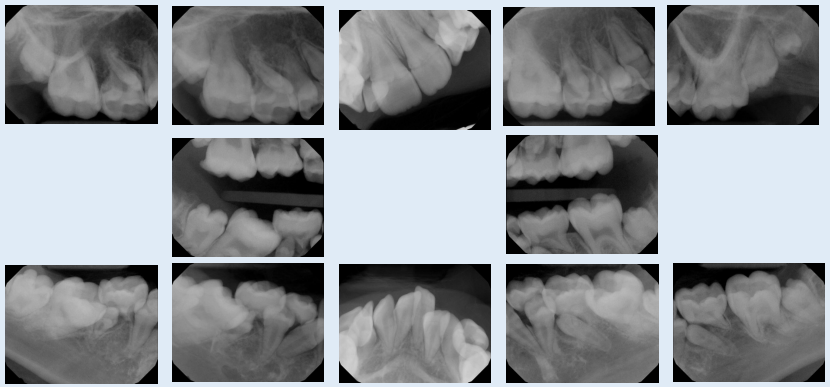

Fig 2. Full mouth series taken 05/2023

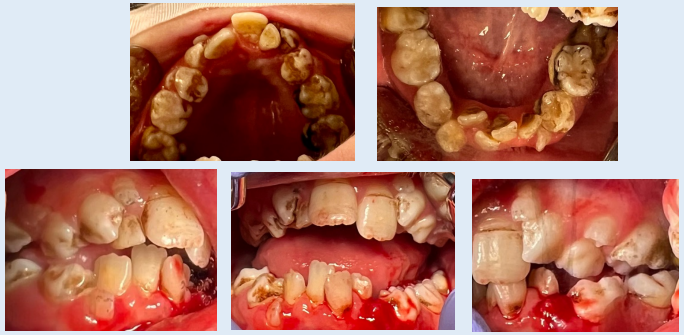

Fig 3. Clinical photos taken 05/2023

Treatment

The patient was seen for her GA sedation appointment in May 2023. A full-mouth series was taken. This helped to evaluate which teeth were microdonts and which primary teeth were not exfoliating naturally due to the morphology of their successors. The previously suspected microdonts were all confirmed. Stunted root maturation were noted on all anterior permanent dentition. These malformations are the effect of the chemotherapy and radiation therapy that was received while the patient was in treatment for the ALL diagnosis. Extractions were completed for #A, B, C, D, H, I, J, K, L, M, 27, S, and T. #27 was extracted due to buccal ectopic eruption, stunted root maturation, and insufficient bone. A thorough cleaning was completed, no carious lesions were noted.

Continuing Care

The patient was seen for their sedation appointment on an urgent basis because of the lack of treatment and care provided since the patient's treatment for ALL. Due to the quick turnaround for the sedation appointment, the patient was unable to be seen by the Craniofacial team for a consult. Patient and mother were made aware that another appointment may be needed once they build a treatment plan and refer to us to help facilitate this care. Craniofacial has been contacted to appoint the patient for a consult to continue care together and construct a plan.

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