Exploring the presence of dental anomalies as a consequence of treatment of malignancy: A case report

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ABSTRACT

Simultaneous presentation of tuberculosis (TB) and lymphoma in a young child is indeed a very rare entity. Malignancy such as Hodgkin's disease (HD) most commonly causes suppression of the cell-mediated immunity, which makes the individual, especially children, more prone to tuberculous infection. One of the non-life threatening complications in these young cancer survivors is the associated dental anomalies. These can seriously impair the quality of life of teenagers and young adults. Higher incidence of caries, discoloration of teeth or even early loss of teeth requiring dental prosthesis, can be associated with the use of cytostatic drugs. These drugs can also disturb odontogenesis, resulting in the absence of tooth buds, microdontia, dilacerations or shortening of tooth roots. Some of the anticancer drugs, including busulfan, cyclophosphamide, doxorubicin etc. May particularly play a significant role in the development of dental anomalies.

This paper is a short review and case report of an 11 year old child having oligodontia and secondary dental complications caused as a side effect of treatment of Hodgkin's lymphoma with Tuberculous Lymphadenitis.

1. Introduction

Malignancies are the second most common cause of death in children around the world. The most common types of pediatric cancers are leukemia, central nervous system tumours, and lymphomas. Radiotherapy, chemotherapy (CT) or a combination of both are the treatment of choice in these diseases.¹ Simultaneous presentation of tuberculosis (TB) and lymphoma in a young child is indeed a very rare entity. Malignancy such as Hodgkin's disease (HD) most commonly causes suppression of the cell-mediated immunity, which makes the individual, especially children, more prone to tuberculous infection. However, with early diagnosis, the management and survival rate for such patients have significantly increased.²

One of the non-life-threatening complications in these young cancer survivors is the associated dental anomalies. Higher incidence of caries, discolouration of teeth or even early loss of teeth requiring dental prosthesis, can be associated with the use of cytostatic drugs. These drugs can also disturb odontogenesis, resulting in the absence of tooth buds, microdontia, dilacerations or shortening of tooth roots. Considering the dentition of young children are at different stages of dental calcification and development, they seem to be at the highest

risk of dental complications resulting from anticancer treatment.³

This paper documents the appearance of secondary dental complications caused due to treatment of Hodgkin's lymphoma with Tuberculous Lymphadenitis in an 11-year-old male child having oligodontia.

2. Case report

An 11-year-old boy reported to the Department of Pediatric and Preventive Dentistry, Faculty of Dentistry, JMI with a chief complaint of tooth mobility in the mandibular left posterior region. Mobility was associated with pain while brushing and chewing. Physically the child appeared to be of his chronological age. Medical history, when elicited, revealed that the patient had a history of the presence of painless swelling over the right side of the neck at the age of 4 years. The swelling was investigated by FNAC, which revealed granulomatous lymphadenitis (tuberculosis). The child was started on ATT, however, even after 4 months of ATT the swelling did not subside. Repeat FNAC and CT scan of neck, chest, and abdomen were performed, followed by a biopsy.

Biopsy revealed features of Hodgkin lymphoma, mixed cellularity

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Fig. 1. Intraoral View: Maxillary and Mandibular arch.

type seen with no evidence of marrow involvement. The patient was given 6 cycles of chemotherapy, ABVD protocol (Drugs Doxorubicin hydrochloride (Adriamycin), Bleomycin sulfate, Vinblastine sulfate, and Dacarbazine). The patient has been going for a regular check-up and is in good health at present. Family history revealed the presence of consanguineous marriage and that mother was also a treated case of tuberculosis. Intraoral examination revealed that the patient had mixed dentition. Intraoral and radiographic examination revealed conical-

shaped 21 with missing 12 and 22 (Fig. 1). It was also observed that 53, 55 and 63 were retained. On further examination, missing 31, 32, 41, 42 and retained 71, 73, 74, 75, 81, 83, 84, 85 with 74, 84 having grade III mobility was seen (Fig. 1). The overall hygiene of the patient was satisfactory. The mucosal cavity was clean. Orthopantomogram (OPG) confirmed these findings. It also revealed missing 15, 16, 17, 27, 31, 32, 37, 41 and 42 (Fig. 2). OPG of mother revealed similar finding to some extent with retained 71 and 81 and missing 12, 22, 24, 26 31, 32, 38, 41, 42, 47, 48 (Fig. 2). There was the presence of root stump of 16. Mother also gave the history of extraction of 48 2 years back, following pain and swelling in that region. The patient and the accompanying parent were unaware of these oral findings. Extraction was done for the patient for 74 and 84 under LA and antibiotic coverage. The patient was advised to maintain proper oral hygiene by brushing twice a day and is being called for periodic oral check ups. Once all the permanent teeth have erupted, the dentition will be evaluated for prosthetic intervention.

3. Discussion

The simultaneous appearance of Hodgkin's disease (HD) and Tuberculosis (TB) in the biopsy of a single lymph node is a very rare finding. Most anti-neoplastic drugs used for management of such cases, block the growth of cells and cause disturbances in tooth eruption and development due to their cytostatic and cytotoxic effects.^{4,5} Animal studies have shown that drugs like vinblastine, doxorubicin, and cyclophosphamide cause dental development disturbances.^{6,7} In the present case also, the child was treated with 6 cycles of chemotherapy at

Fig. 2. OPG of mother and the patient.

the age of 4–5 years for Hodgkin's Lymphoma. Drugs used in chemotherapy were Doxorubicin hydrochloride (Adriamycin), Bleomycin sulfate, Vinblastine sulfate and Dacarbazine for 6 months, which can clearly explain the partial absence of Permanent 2nd Molar, the complete absence of Permanent 3rd molar tooth buds and variation in the shape of 23, 21,35 and 45. 3–5 years is the age of initiation of calcification of Permanent 2nd Molars and at this age, other teeth of permanent dentition are also in various stages of crown formation.^{8,9}

Oligodontia is the congenital absence of six or more permanent teeth excluding third molars and has been shown to affect 0.08–0.16% of children. Mutations in genes AXIN2, MSX1, and PAX9 are known to cause hypodontia and oligodontia. AXIN2 mutations are associated with autosomal dominant oligodontia whereas mutation in either of MSX1 and PAX9 genes are known to cause autosomal-dominant posterior tooth agenesis.^{10,11} In the present case also, the patient and his mother, both presented with oligodontia and marked similarities between the dentition. For instance, absence of Permanent Mandibular Incisors, Maxillary Lateral Incisors, retained Mandibular Primary Incisors etc.

Though in the patient, there is congenital absence of multiple teeth of permanent dentition (oligodontia); there are also features which indicate towards the role of cytotoxic drugs in causing structural malformation and tooth agenesis; as permanent 2nd and 3rd molars which were present in mother were completely absent in the patient. Such cases require special care and regular follow up; as was done in this case. Extractions and restorations as and when indicated were done.

4. Conclusion

The appearance of Hodgkin's lymphoma with Tuberculous Lymphadenitis in a single lymph node is a rare finding. The present case highlights the appearance of tooth agenesis and structural

abnormalities (shape) caused due to the treatment of Hodgkin's lymphoma with Tuberculous Lymphadenitis with cytotoxic drugs in an 11-year-old male child having oligodontia. Close family and professional supervision are needed to ensure that such patients receive appropriate dental treatment and psychological support.

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