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## Case report

# Dental management long term follow-up of the post radio-chemotherapy—Rhabdomyosarcoma patient: Report of a case

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## ABSTRACT

Rhabdomyosarcoma (RMS) is the most common soft-tissue sarcoma of childhood and adolescence involving the head and neck. It occurs most often in the head and neck region, genitourinary tract, retroperitoneum and the extremities. The current treatment of a combination of surgery, chemotherapy and radiotherapy has dramatically improved the long term survival rates over the last 20 years. However, some of the side effects of post-radiation include delayed eruption of teeth, retarded tooth and bone development, dwarfed teeth, partial anodontia, osteoradionecrosis, xerostomia, mucositis, candidiasis, trismus, loss of taste, soft tissue necrosis, and scar tissue formation. RMS is a comparatively rare lesion for the maxillofacial surgeons. Although documented to be the most common soft tissue sarcoma in children under 15 years of age, there is, however, a paucity of reports on the pattern of the late effects of multimodal treatment results about intra-oral involvement. This case report focused on the dental treatment and facial abnormalities in a long-term survivor of pediatric head and neck RMS patient and review of the literature.

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## 1. Introduction

Rhabdomyosarcoma (RMS) is an aggressive malignant tumor composed of neoplastic mesenchymal cells that infiltrate surrounding tissue structures, making their precise site of origin unclear [1]. RMS is rare in adults, however it occurs throughout childhood and adolescence, the median age at diagnosis is only about 5 years [2,3]. Head and neck RMS is anatomically divided into two categories: parameningeal (including RMS of the nose, nasopharynx, middle ear, paranasal sinuses, mastoid infratemporal fossa, and pterygopalatine fossa) and nonparameningeal (including RMS of the orbit, scalp, parotid gland, oral cavity, oropharynx and larynx) [4–6].

Head and neck RMS has a distinct prognosis and biological behavior. RMS has four distinct histopathological subtypes: embryonal, alveolar, pleomorphic (anaplastic) and undifferentiated [5,7]. The embryonal subtype is the most common subtype, inclined to

occur in young patients and usually arises in the perioral regions [4].

The use of contemporary treatment of combination of ablative surgery, multiagent chemotherapy and radiotherapy has dramatically improved the long-term survival rates over the last 20 years [8]. However, this multi-modal therapy has a significant effect on maxillofacial skeletal growth, dental development, and the whole ecologic system of the oral cavity.

This case report demonstrates the disturbed nature of the active treatment phase of RMS as well as the dental and facial abnormalities in a long-term survivor of pediatric head and neck rhabdomyosarcoma patient with the literature review.

## 2. Case report

An 11-year-old male patient was diagnosed as embryonal+alveolar type rhabdomyosarcoma of oropharynx, mainly on the right tonsil measuring 2 cm × 2 cm. Erosive lesion and 6 LAPs at the right jugulodigastric region in 1998. Haematoxylin and eosin-stained sections revealed a malignant neoplasm of mesenchymal origin constituted of a loose myxomatoid stroma exhibiting scattered pleomorphic cells. He was treated with combination of ablative surgery, multiagent chemotherapy and radiotherapy according to a Children's Cancer Group protocol. Chemotherapy consisted of Vincristine 2 mg/m<sup>2</sup>, Actinomycin-D 0.015 mg/kg and Ifosfamide 1.8 mg/m<sup>2</sup> for 43 weeks. Complementary radiotherapy

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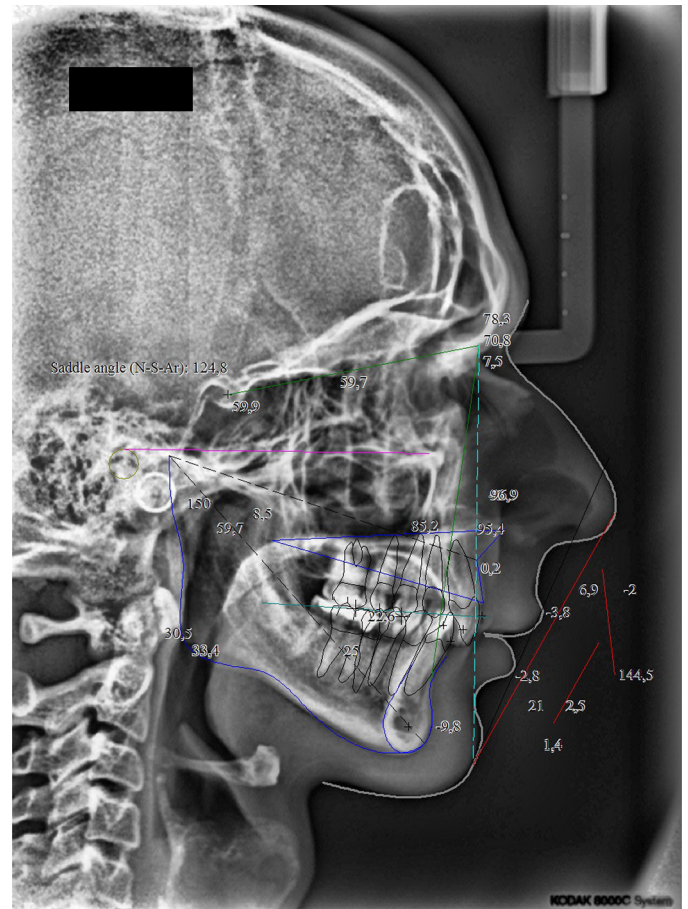
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**Fig. 1.** The clinical view of the patient showing enamel defects, severe deep-bite, and altered growth of the facial skeleton.

was applied 4140 cGy in 23 fractions. Radiotherapy was started at 07.01.1999 to the primer tumor region and upper cervical lymph nodes in 180 cGy fractions with cobalt-60 teletherapy machine and was completed at 16.02.1999 and chemotherapy was completed in August 1999. During the active phase of treatment the patient developed a series of problems including three occasions with febrile neutropenia and painful radiation-induced mucositis. These problems were solved with chlorhexidine and antibiotic therapy. More than 11 years following completion of this multimodal treatment the patient is alive without evidence of disease.

The patient was referred to Gülhane Military Medical Academy (GMMA) oral and maxillofacial surgery unit for lower bilateral second molar teeth extraction at the age of 22, some 11 years after completion of his combination tumor treatment. The clinical examination showed enamel defects, severe deep-bite, and altered growth of the facial skeleton (Figs. 1 and 2 and Table 1). Dental radiological examination (OPG) revealed disturbance in root formation (e.g., root stunting/tapering, incomplete root development, root agenesis in the lower second molar teeth), underdeveloped mandible and upper 2nd molar, upper and lower bilateral 3rd



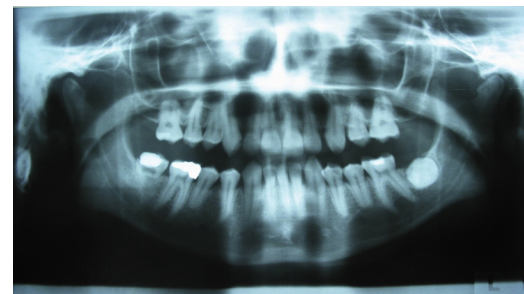
**Fig. 2.** The cephalometric radiograph and tracing indicate facial abnormality.

**Table 1**  
The cephalometric measures of the patient comparing to the normal values.

Cephalometric measures	Patient's values	Normal values
SNA	78.3	82
SNB	70.8	80
ANB	7.5	2
Pog to Nasion perp.	-9.8	-
Anterior cranial base (S-N)	59.7	53
Mandibular body (Go-Me)	55.4	130
Ar-Go	30.5	-
Saddle angle (N-S-Ar)	124.8	125
Occlusal to SN	22.6	16
SN to GoGn	33.4	32
Palatal plane to GoGn	25	-
N-ANS (FH)	43	-
N-Me (FH)	95.4	-
Posterior face height (S-Go)	59.7	62
Anterior face height (Na-Me)	96.9	65
Interincisal angle	144.5	131
Upper Inc. to NA	6.9	22
Upper Inc. to NA (mm)	-2	4
Lower Inc. to NB (mm)	2.5	4
Lower Inc. to NB	21	25
Pog to NB	1.4	4
Upper lip to E plane	-3.8	-
Lower lip to E plane	-2.8	-
Overbite	6.7	-
Overjet	5.1	-

The cephalometric measures of the patient showing skeletal abnormality.

molar teeth agenesis (Fig. 3). The patient was consulted with the general dentist about the congenital tooth abnormality, however it was mentioned that there was no record of congenital tooth abnormality neither of the patient nor the relatives, so the teeth agenesis was thought to be a result of multimodal therapy. The permanent mandibular second molar teeth were rootless bilaterally, right one had a temporary restoration but not displayed mobility; however he had reported pain and left one was impacted at buccolingual position. The patients presented no lymphadenopathy of submandibular and cervical nodes. Appropriate Medical consultations obtained prior to dental treatment (blood counts were normal) under local anesthesia did not prescribe any hyperbaric oxygen therapy. Under local anesthesia lower second molar teeth were extracted and prescribed amoxicillin + clavulanic acid, paracetamol and chlorhexidine for a week (Fig. 4A and B). A follow-up



**Fig. 3.** The pretreatment panoramic radiograph showing disturbance in root formation, underdeveloped mandible and upper 2nd molar, upper and lower bilateral 3rd molar teeth agenesis.

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