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Tooth development included in the multifocal jaw lesions of langerhans cell histiocytosis

T. MITOMI, M. TOMIZAWA & T. NODA

Division of Pediatric Dentistry, Department of Oral Health Science, Course for Oral Life Science, Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan

Summary. Many cases demonstrating the oral manifestations of langerhans cell histiocytosis (LCH) have been reported; however, tooth development in jaw lesions has rarely been mentioned. This paper reports the case of a 3-year-old Japanese girl with LCH suffering from multiple osteolytic lesions of the skull and jaw bones. She was referred to our paediatric clinic because of swelling of the mucogingival folds in the upper and lower primary molar regions. The patient responded well to steroid therapy and the osteolytic lesions resolved. There was an accompanying development of permanent tooth germs included in the lesions. Langerhans cell histiocytosis in children usually has a long-term clinical course and paediatric dentists should be involved with oral health care for affected patients.

Introduction

Langerhans cell histiocytosis (LCH), formerly known as Histiocytosis X, is characterized by an abnormal proliferation of histiocytes of unknown cause. It affects various organs, such as the bone, skin, liver, spleen, lung and brain [1]. Oral involvement is frequently found, including gingival enlargement, oral ulceration, mobility of the teeth and jaw pain [1,2]. In young children, the jaw lesions may affect tooth-germ development and there have been a small number of reports of disturbances in dental development, such as enamel hypoplasia of permanent teeth [3–5]. The purpose of the present report was to describe the clinical course of a case of multifocal LCH involving jaw lesions in a 3-year-old Japanese girl and progress of tooth development in the lesions.

Case report

A 3-year-old Japanese girl was referred to the Paediatric Dental Clinic of Niigata University Dental Hospital by her paediatrician because of gingival bleeding. She had already been diagnosed as suffering from LCH.

Onset of LCH had been at the age of 9 months when she presented with facial palsy. She had also presented with eczema of the parietal region and cervical and inguinal lymphadenopathy at the same time. A diagnosis of LCH, based on a cervical lymph node biopsy, had been made at the age of 10 months. The child had subsequently been diagnosed with diabetes insipidus at the age of 2 years and 1 month. Treatment with prednisolone and cytotoxic drugs daily for three consecutive days twice a month had started at 11 months of age and continued for 1 year and 4 months. There had been frequent recurrences of fever and cervical lymphadenopathy since the steroid therapy had been discontinued. When the patient was 3 years and 2 months old, her mother had noticed gingival bleeding from the upper primary molar region, and her paediatrician then referred the patient to our clinic (Fig. 1).

At the first examination, the patient's height and weight were 93.8 cm and 14.8 kg, respectively, which was within the 50–90% percentiles in the cross-sectional growth chart for Japanese girls.

Extraoral examination showed swelling of the head and exophthalmos.

Correspondence: Dr T. Mitomi, Division of Pediatric Dentistry, Niigata University Graduate School of Medical and Dental Sciences, 2–5274, Gakkocho-dori, Niigata, 951–8514, Japan.
E-mail: mitomi@dent.niigata-u.ac.jp

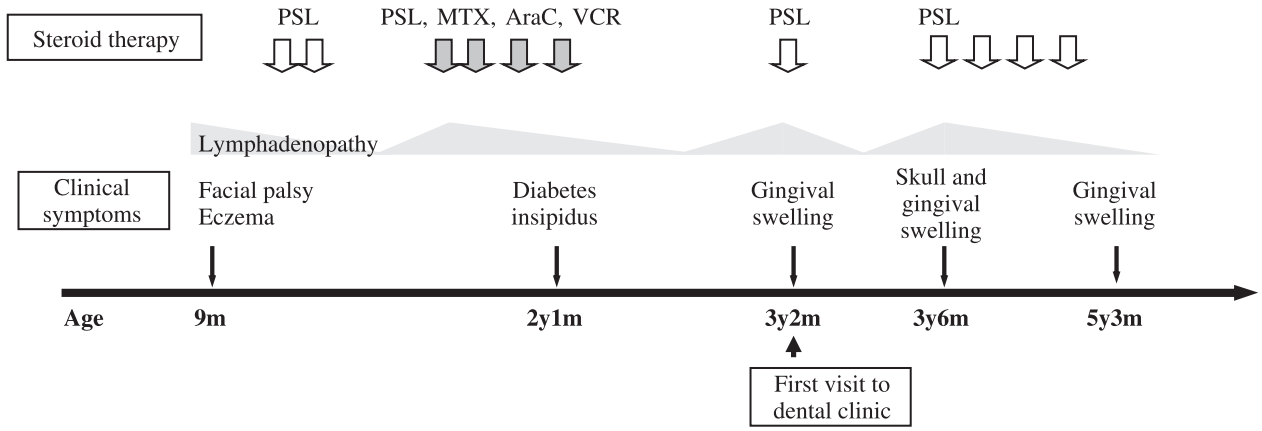

Fig. 1. Clinical course of the patient. PSL, Prednisolone; MTX, Methotrexate; AraC, Cytosin arabinoside; VCR, Vincristine.

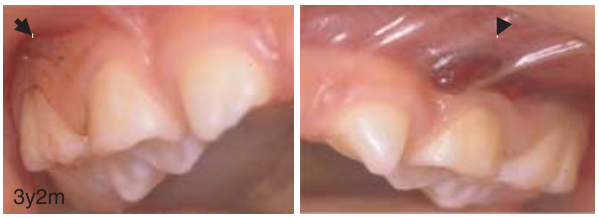

Fig. 2. Intra-oral photographs: buccal swelling of the upper molar regions, dark violet in colour, is evident (arrowhead).

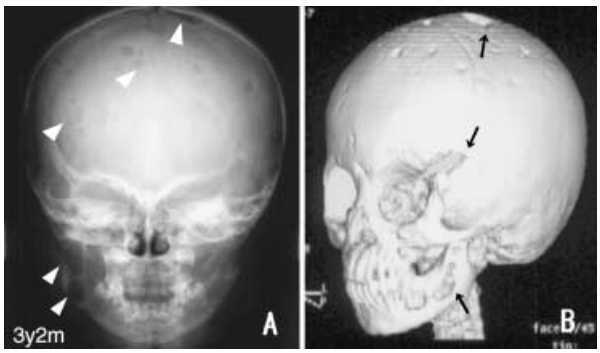

Fig. 3. Cephalometric radiograph (A) and helical computed tomography (B) showing the multiple well-defined osteolytic lesions in the skull and mandible (arrowhead and arrow).

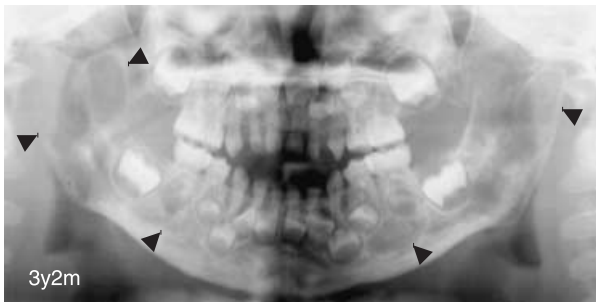

Fig. 4. Panoramic radiograph at 3 years and 2 months: multiple jaw lesions including the tooth-germ of permanent lower premolars (arrowhead).

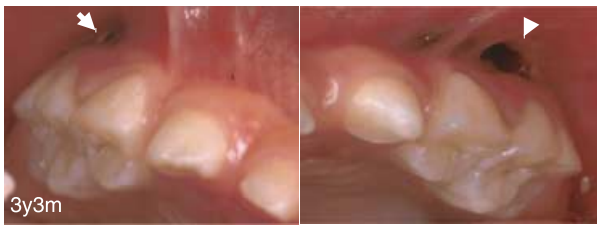

Fig. 5. One month after steroid therapy, halls in the upper primary molar regions have appeared (arrowhead).

Intraoral examination showed all primary teeth to be present. Swelling of the mucogingival folds was found in the upper and lower primary molar regions. The buccal swelling of the upper left molar region was a dark violet colour and bled easily on palpation (Fig. 2). There was no pathological mobility of the primary teeth and these were free of obvious caries.

Radiographic examination revealed multiple osteolytic lesions of the skull and mandible. The mandibular lesions extended from the region of the right and left primary molars to the condyles (Fig. 3). With respect to mandibular teeth, one-third of the crown of the permanent lower first premolars and only the beginning of the lower second premolars showed evidence of mineralization (Fig. 4).

Prednisolone (25 mg/day) was commenced for 1 month, causing a reduction in gingival swelling; however, sinuses appeared in the mucogingival fold adjacent to the upper right and left second primary molars (Fig. 5). On the left, the size of the sinus was 15×5×5 mm. To avoid the sinuses becoming infected, regular daily mouth washing with povidone iodine

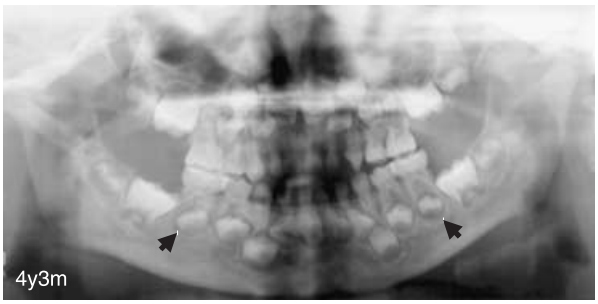

Fig. 6. After 1 year of steroid therapy, the tooth-germ development of the permanent premolars is noted (arrowhead).

was prescribed. The sinuses healed after 1 month. Three months after the steroid therapy was discontinued, swelling of the skull and the lower molar gingival regions reappeared. Prednisolone (70 mg/day) daily for five consecutive days once a month was resumed and continued for a year. The patient responded well, and radiographic examination revealed a reduction in the osteolytic lesions, together with continued development of the permanent premolar tooth germs (Fig. 6). Two months after cessation of steroid therapy, the patient presented with swelling of the chin and lower incisor gingival region. Although steroid therapy was not resumed, the swelling gradually diminished. The lower primary incisors exfoliated at 5 years and 3 months of age. The osteolytic lesions of the child's maxilla and mandible have not completely resolved and the patient has remained under observation.

Discussion

Langerhans cell histiocytosis sometimes tends to heal spontaneously over a period of months to years; however, some cases have a long-term clinical course with remissions and recurrences [1,6,7].

Langerhans' cells infiltrate various organs, such as the bone, skin, liver, spleen, lung and brain. Bone lesions commonly involve the skull, sella turcica, mandible, ribs and pelvis [8]. Initial physical findings often include skin rash, otitis media, fever, organomegaly, anaemia and diabetes insipidus [1,8]. Oral manifestations may be the earliest sign of this disorder, which may include gingival bleeding, tooth mobility and premature exfoliation [8–12]. The incidence of oral involvement is approximately 10% of that of Histiocytosis X, and the predominant regions are the mandible and posterior portion of the jaw [8].

Our patient first presented with facial palsy at the age of 9 months. She also had a medical history of eczema, fever, diabetes insipidus and exophthalmos. She suffered from gingival bleeding and swelling, and had multiple osteolytic lesions of the skull, maxilla and mandible.

In terms of radiological findings, the jaw lesions usually have well-defined margins. With severe bone destruction, the teeth may appear to be 'floating in air' [8]. Dagenais *et al*. [9] have delineated seven different radiographic characteristics of the jaw lesions of Histiocytosis X, including solitary intraosseous lesions, a multiplicity of alveolar bone lesions, a well-defined periphery, a scooped-out effect in the alveolar process, sclerosis in the alveolar bone lesions, periosteal new bone formation and slight root resorption.

In our patient, the radiographic examination revealed well-defined multiple lesions showing widespread bone destruction in the mandible; however, there was no obvious alveolar bone loss or root resorption, and clinically there was no evidence of tooth mobility.

Treatment depends upon the severity and progression of the clinical signs and symptoms. Treatment methods for LCH include observation for spontaneous regression, surgical curettage, radiation, topical injection of steroid and systemic steroid therapy [13]. Surgical curettage and topical injection of steroid are usually the preferred treatments for solitary jaw lesions. In young children, radiation therapy to the jaw may result in damage to the developing teeth and bone and is thus not a first choice [14]. Steroid therapy is usually used when multiple organs are involved or when organ dysfunction is present [15].

In our case, the patient had multiple osteolytic lesions, and systemic Prednisolone was used to address the multifocal LCH with both skull and jaw involvement. The patient responded well to this approach and showed a continuation of tooth-germ development in permanent premolars that were included within the osteolytic lesions.

We have previously reported the case of a 13-year-old patient who had recovered from Hand-Shüller-Christian disease [5]. She presented with malocclusion with delayed eruption of permanent teeth. Radiographic examination showed root dwarfism, malformation, and hypoplasia of the permanent teeth. Oral involvement had not been apparent during the illness, and there was some possibility that either the lesions of LCH or the steroid therapy agent might have affected the patient's dental development.

In the present case, the permanent teeth appear to have developed normally to date; however, the patient has a medical history of cytotoxic steroid therapy and the lesions of LCH with jaw involvement have not completely resolved. She still requires long-term follow up and a regular review of permanent tooth development and eruption.

Résumé. De nombreux cas ont été rapportés de manifestations buccales d'histiocytose à cellules de Langherhans (LCH). Cependant, le développement dentaire dans les lésions de la mâchoire a été rarement mentionné. Cet article décrit le cas d'une jeune fille japonaise de 3 ans avec LCH souffrant de lésions ostéolytiques multiples du crâne et des os des mâchoires. Elle a été adressée à notre clinique pédiatrique pour un gonflement muco-gingival dans les régions molaires temporaires maxillaire et mandibulaire. La patiente a bien répondu à la chimiothérapie et les lésions ostéolytiques se sont résorbées. Cette guérison a été accompagnée d'un développement des germes des dents permanentes inclus dans les lésions. La LCR chez l'enfant est généralement un problème clinique à long terme et les pédodontistes devraient être concernés par la santé buccale des patients atteints.

Zusammenfassung. Es wurden bereits viele Fälle oraler Manifestationen der Langerhanszell-Histiozytose (LCH) veröffentlicht, dabei wurde allerdings kaum auf die Zahnentwicklung in betroffenen Kieferarealen eingegangen. In dem vorliegenden Bericht wird ein Fall eines dreijährigen japanischen Kindes mit multiplen Läsionen von Schädel- und Kieferknochen berichtet. Sie war aufgrund von Schwellungen in den Umschlagfalten der oberen und unteren Molaren in die Kinderklinik überwiesen worden. Die Patientin sprach gut auf die Chemotherapie an, die Osteolysen gingen zurück. Daneben wurde eine Weiterentwicklung eines permanenten Zahnkeimes in einer Läsion festgestellt. LCR bei Kindern weist oft einen langwierigen Verlauf auf, bei betroffenen Patienten sollten Kinderzahnärzte mit in die Mundgesundheitsbetreuung einbezogen werden.

Resumen. Se han comunicado muchos casos que muestran manifestaciones orales de la histiocitosis de células de Langerhans (HLC), sin embargo poco se ha mencionado sobre el desarrollo dentario en las lesiones maxilares. Este artículo informa del caso de un niña japonesa de 3 años con HLC afectada de múltiples lesiones osteolíticas en el cráneo y los maxilares. Fue referida a nuestra clínica pediátrica debido a la inflamación de los pliegues mucogingivales en las regiones de los molares primarios superiores e inferiores. La paciente respondió bien a la quimioterapia y se resolvieron las lesiones osteolíticas. Se acompañó del desarrollo de los gérmenes de los dientes permanentes incluidos en las lesiones. La HLC en niños generalmente tiene un curso clínico largo y los odontopediatras deberían implicarse en el cuidado de la salud oral de los pacientes afectados.

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