VOLUME-8, ISSUE-2, FEBRUARY-2019 • PRINT ISSN No 2277 - 8160

Original Research Paper

Endocrinology

A HORMONAL IMBALANCE- ITS IMPACT ON ERUPTION AND EXFOLIATION: A CASE REPORT

Dr. Amith Adyathaya	Professor, Department Of Pedodontics, KMCT Dental College, Manassery, Calicut.
Dr. Ershad Ahmed*	Former Post Graduate, KMCT Dental College, Manassery, Calicut, *Corresponding Author
Dr. Prathyusha. P	HOD And Professor, Department Of Pedodontics, KMCT Dental College, Manassery, Calicut,
Dr. Afroza K K	Post Graduate Student, Department Of Pedodontics, KMCT Dental College, Manassery, Calicut
Dr. Ann Meera Johnson	Post Graduate Student, Department Of Pedodontics, KMCT Dental College, Manassery, Calicut.

ABSTRACT Delayed tooth eruption is the emergence of a tooth into the oral cavity at a time that deviates significantly from norms established for different race, ethnicity, and gender. It may be due to many local and systemic reasons, eruption delay of more than two years should be definitely investigated.

Certain endocrinal hormonal imbalances that occur in infancy or early childhood can lead to many clinical manifestations like short stature, delayed tooth eruption and delay in major developmental milestones. The possibility of hormonal disturbances should be suspected when evaluating teenagers and adolescents with the complaint of delayed eruption, both physician and dentist should be aware of this clinical manifestation. This is a case report on delayed eruption of teeth in a teenager with undiagnosed hormonal imbalance who visited our department, a watchful eye and timely investigation led to the diagnosis of underlying organic problem.

KEYWORDS : Delayed Eruption,,Hormone,

INTRODUCTION

Eruption of deciduous teeth, their exfoliation followed by eruption of permanent dentition is an orderly sequential and age specific event[1].The stages of eruption include pre eruptive movements, intraosseous stage, mucosal penetration, preocclusal and post occlusal stages[2]. Most parents are anxious about the variation in the timing of the eruption, which is considered as an important milestone during child's development. Racial, ethnic, sexual, and individual factors can influence eruption and are usually considered in determining the standards for normal eruption.[2,3] Delayed tooth eruption (DTE) is the deviation most commonly encountered in terms of normal eruption time. DTE might be the primary or sole manifestation of local or systemic pathology.[4]

Certain hormones plays a vital role in the process of eruption, and also have a structural impact on developing teeth. Even though the regulatory effects of thyroid hormones on bone development and metabolism have been known for a long time, the mechanisms of thyroid hormone action on the skeleton are still a matter of debate [5-7]. Along this line, even though there are reports of delayed tooth eruption in the literature, this condition will unlikely be the patient complaint and is seldom recorded during clinical examination, possibly because physicians generally have difficulty making this assessment, or because it is not seen as a sign of severe disease. However, the possibility of thyroid hormonal imbalance should be suspected when evaluating adolescents with delayed dentition, and both physicians and dentists should be aware of its clinical manifestation.

This case reports an undiagnosed hormonal imbalance in a female who complained of delayed tooth eruption[8], who sought treatment for the same in our clinic.

CASE REPORT

A female teenager aged 15-years and 4 months reported to the Department of Pedodontics and Preventive dentistry, K.M.C.T Dental College, Calicut, Kerala with a chief complaint of retained upper deciduous teeth which bothered her because she was aesthetically concerned . The parents also expressed their concern about the delayed eruption of permanent teeth. General examination was carried to rule out the presence of any syndrome. Medical and family histories were non-contributory.

On extra oral examination an ill-defined oedematous bilateral swelling in the neck was observed (Figure 1), which neither child nor parents were unaware. Intraoral examination revealed midline diastema, retained deciduous maxillary right and left primary canine, primary first and second molars.

Teeth present:

17	16	55	54	53	12	11	21	22	63	64	65	26	27	
47	46	45	44	43	42	41	31	32	33	34	35	36	37	

Figure 1

Figure. 2

Orthopantamograph(OPG) examination revealed maxillary right and left primary canine and molars were retained and permanent

maxillary right and left canines and premolars were erupting with incompletely formed roots (Figure 2) . Other etiologies for delayed eruption like absence of permanent successors, presence of supernumerary teeth, ankylosis and the presence of any mesiodens were ruled out.

When chronological age and dental age were estimated a difference of 3.5 years was noticed. Hence provisional diagnosis of endocrine disorder was established. Accordingly investigation on thyroid hormonal assay was advised.

INVESTIGATION REPORT

The value of TSH level was increased to 18.9 µIU/ml from normal range of 0.3 - 5.5 µIU/ml T3 and T4 hormonal level was in normal range 02.6 (1.7-4.2ng/dl) 0.8(0.7-1.8ng/dl) respectively.

Thus, diagnosis of subclinical hypothyroidism was confirmed.
Parent of the patient was informed of her existing systemic condition and was referred to an endocrinologist.

The child was medicated with Tab. THYROX -50 microgram once daily for 30 days to reduce the TSH hormonal level. After 1 month, re-assay was done and 2 fold (41.82µIU/ml) increases in TSH level was found. Then the dosage was doubled the dosage to 100 microgram once daily for 2 months. After 2 months, TSH level came down to normal with a value of 2.8µIU/ml. As a maintenance dosage Tab.THYROX – 50(microgram) once daily for 2 months and Tab. STALCAL CT once daily for 30 days was advised .Patient was reviewed every month.

MECHANISM OF ACTION OF TSH ON ROOT RESORPTION

The process of eruption and resorption that is maintained by osteoprotegerin (OPG), the receptor activator of nuclear kappa B ligand (RANKL) and receptor activator of nuclear kappaB (RANK) system which is regulated by several hormones including thyroid hormones.

Resorption is a continuous process of odontoclastic and odontoblastic activity. RANKL enhances odontoclastic activity; increased OPG suppresses odontoclastic activity. Thyroid hormone acts on OPG /RANKL/RANK system.

In subclinical hypothyroidism T3 and T4 level is normal and TSH is increased. Increased TSH increases OPG transcription which in turn neutralizes RANKL activity by inhibiting the binding of RANKL-RANK system which is involved in odontoclastic activity and differentiation thus resulting in delayed exfoliation of teeth.[9,10]

Considering the intraosseous stage, bone height and mucosal penetration eruption was estimated to occur within 10-12 months .

TREATMENT PLAN

The proposed dental treatment included:

1) Serial extraction of primary teeth.
2) A functional removable space maintainer in relation to 13,15,23,24,25.
3) On evaluation after 1year,considering the root formation, orthodontic extrusion of 13,15,23,24,25 will be initiated.

TREATMENT DONE

Considering the frequency of visits,child's parents ignored the serial extraction procedure and extraction of all retained primary teeth were done in a short span by a nearby private practitioner(Figure.3). Thus further delaying the eruption of permanent teeth. Active eruption was noticed in relation to 13,14,15,23,24 and 25 when patient was evaluated with OPG after 10months(Figure.4).

A functional removable space maintainer in relation to 13,15, 23, 24, and 25 was fabricated and delivered(Figure.5).

Figure.3.Pre op after extraction of primary teeth- Right lateral side

Figure.4 - OPG after 10 months

Figure.5.POSTOPERATIVE PHOTOGRAPH-after 10 months RIGHT LATERAL SIDE

DISCUSSION

Hypothyroidism occurs in about 1% to 2% of the general population[11]. Up to 5% of the female population has alteration in the thyroid function[12]. It is caused by chronic autoimmune thyroiditis (Hashimoto's disease), radioactive iodine, surgery and pharmacological agents such as Lithium and Amiodarone[11-14]. However, some cases appear with no identifiable etiology as in this case[11,12]. The common clinical feature of hypothyroidism may include dwarfism, overweight, broad flat nose, poor muscle tone, wide set eyes, thick lips, large, protruding tongue, pale skin, stubby hands, retarded bone age and delayed eruption of teeth[11,12,15]. The pediatric dentist may be the first to detect early signs and symptoms of thyroid disorder in a child. Only delayed eruption of teeth due to retained primary teeth was present in this case, which could be a sign of subclinical hypothyroidism. The roots of deciduous predecessors showed no signs of resorption,indicating an imbalance between osteoclastic and resorption process[19].

A watchful eye led to investigation and helped in diagnosis of an underlying organic problem of hypothyroidism in the present case.

Replacement therapy with thyroxine (levothyroxine sodium) is the standard approach for the treatment of hypothyroidism, [14,16,17,18] which returns patients to a biochemical euthyroid state. Once euthyroid state is achieved, the patient's TSH and T4 levels are followed for periods of six month to one year. In the present case, improvement in TSH levels was noted within 2 months of treatment with thyroxine. If a suspicion of thyroid disorder arises for an undiagnosed patient, all elective dental treatment should be put on hold until a complete medical evaluation is performed[12,14]. Once the hypothyroid patient is medically stable, there is no contraindication

for dental procedures. In the present case, once the hypothyroidism was under control, we planned dental treatment which included planned sequential extraction followed by space maintainer and orthodontic extrusion of permanent canines and premolars.

CONCLUSION

An understanding of thyroid dysfunction is of significant importance to the pediatric dentist for the reason that the dentist may be the first to suspect a serious thyroid disorder and aid in early diagnosis in children. Communication of the dentist with the endocrinologist must be bidirectional, to maintain patient's oral and thyroid normalcy. Early detection of thyroid disorder in a child may improve the quality of life and dental complication of certain thyroid disorders can be eliminated. In cases of delayed eruption of teeth without any significant etiological factors, essay of thyroid disorder should be considered as a routine investigation plan.

Some of the complaints driving teenagers to seek health care may seem trivial,but a watchful eyes will not miss the need to investigate and diagnose an underlying organic problem.

REFERENCES

1. Pahkala R, Pahkala A, Laine T. Eruption pattern of permanent teeth in a rural community in northeastern Finland. Acta Odontol Scand. 1991; 49:341-9.
2. Nolla CM. The development of the human dentition. ASDC J Dent Child 1960;27: 254-66.
3. Proffit WR, Fields HW. Contemporary orthodontics. 3 rd ed. Mosby Inc.; 2000.
4. Kochhar R, Richardson A. The chronology and sequence of eruption of human permanent teeth in Northern Ireland. Int J Paediatr Dent 1998;8: 243-52
5. Gouveia CH. O efeito molecular e estrutural do hormônio tireoideano no esqueleto. Arq Bras Endocrinol Metab 2004;48:183-95.
6. Setian N. Hipotireoidismo. Pediatria (São Paulo) 1981;3:108-19.
7. Teixeira FS, Campos V, Mitchell C, Carvalho LM. Retenção prolongada de molares decíduos: diagnóstico, etiologia e tratamento. R Dental Press Ortodon Ortop Facial 2005;10:125-37.
8. Levin HL. Some dental aspects of endocrine diseases. Oral Surg Oral Med Oral Pathol 1965;19:466-77.
9. Joanna B. Tyrovola.Root resorption and the OPG/RANKL/RANK system: a mini review.journal of oral science ,vol.50, No.4, 367-376,2008.
10. Physiologic root resorption in primary tooth: molecular and histological events.Evalmbia harokopakis. Journal of oral science, Vol.49, No. 1, 1-12, 2007.
11. Little JW. Thyroid disorders. Part II: Hypothyroidism and thyroiditis. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;102:148-53.
12. Chandna S, Bathla M. Oral manifestations of thyroid disorders and its management. Indian J Endocrinol Metab 2011;15:S113-6. .
13. Nagendra J, Srinivasa J. Dental treatment alteration in thyroid disease. Pak Oral Dent J 2011;31:23-6.
14. Pinto A, Glick M. Management of patients with the thyroid disease: Oral health considerations. J Am Dent Assoc 2002;133:849-58.
15. Huber MA, Terezhalmy GT. Risk stratification and dental management of the patient with thyroid dysfunction. Quintessence Int 2008;39:139-50.
16. Stewart CM. Endocrine diseases. In: Silverman S, Eversole SL, Truelove EL editors. Essentials of Oral Medicine. 1 st ed. Hamilton (London); BC Decker Inc: 2001. p. 84-99.
17. Ayna B, Tumen DS, Celenk S, Bolgul B. Dental treatment way of congenital hypothyroidism: Case report. Int Dent Med Disord 2008;1:34-6.
18. McMillan C, Bradley C, Razvi S, Weaver J. Psychometric evaluation of a new questionnaire measuring treatment satisfaction in hypothyroidism: The ThyTSQ. Value Health 2006;9:132-9.
19. Vitalle MS, Weiler RM, Niskier SR, Braga JA. Delayed tooth eruption in an adolescent with hypothyroidism. Revista Paulista de Pediatria. 2012 Dec;30(4):613-6.