RSBO

ISSN:
Versão eletrônica: 1984-5685
RSBO. 2018 Jul-Dec;15(2):116-22

Case Report Article

Platelet and blood transfusion in a child with dyskeratosis congenita for dental extraction – a case report

Sayali Mali[1]
P. Keerthi Kundana[2]
Sunita Singh[1]
Sinika Khanchandani[1]
Milind S. Tullu[2]
Mukesh Agrawal[2]
Adesh Kakade[1]

Corresponding author:
Adesh Kakade
Nair Hospital Dental College
Mumbai – India
E-mail: adeshkakade@rediffmail.com

[1] Department of Pediatric Dentistry, Nair Hospital Dental College – Mumbai – India.
[2] Department of Pediatrics, Seth G.S. Medical College & KEM Hospital – Mumbai – India.

Received for publication: May 19, 2018. Accepted for publication: June 7, 2018.

Palavras-chave:
leukoplakia;
dystrophic nails; skin pigmentation.

Abstract

Introduction and Objective: Dyskeratosis congenita (DC) also known as Zinsser-Engman- Cole Syndrome is a rare inherited disorder with a prevalence of less than one per million. Zinsser *et al*. described an inherited variant of ectodermal dysplasia that affected skin, nails and mucous membranes in early 1900s.The syndrome eventually came to be known as DC and is classified as one of the inherited bone marrow failure syndromes (IBMFS). DC is the association of three clinical features: dystrophic nails, oral leukoplakia (white spots on the tongue and oral mucosa) and abnormal skin pigmentation. **Case report and Conclusion:** This case report describes a dental management of a case of DC. Fluctuating vital and blood parameters and deteriorating overall health status were major challenges delivering dental treatment. Dental extractions of this patient were done while maintaining blood parameters by blood and platelet transfusion.

Introduction

In the early 1900s, Zinsser *et al*. described an inherited variant of ectodermal dysplasia that affected skin, nails and mucous membranes. The syndrome is classified as one of the inherited bone marrow failure syndromes (IBMFS). Dyskeratosis congenita (DC) also known as Zinsser-Engman-Cole syndrome is a rare inherited disorder with a prevalence of less than one per million. DC was defined by the association of three clinical features: dystrophic nails, oral leukoplakia and abnormal skin pigmentation. Clinically, there appears to be three patterns of inheritance of DC, autosomal dominant, autosomal recessive and X-linked recessive. Though all three modes of inheritance are known, the most common is X linked recessive involving DKC1 gene. The condition is seen predominantly in males with male to female ratio being 13:1 [1, 7].

Diagnosis may be delayed until clinical signs are apparent, usually between the ages of 5 and 12 years with nail dystrophy and pigmentation of the skin being the most frequent manifestations [7]. Various dental abnormalities have been observed in cases of DC like hypodontia [12], short blunted roots [11, 12], hypocalcification [9], thin enamel [6], alveolar bone loss resembling juvenile periodontitis [3, 11, 12], early dental loss [2, 3, 10] and extensive caries [11]. Whereas, gingival recession [3, 4], gingival inflammation with oedema [11, 12], gingival bleeding, smooth atrophic tongue mucosa [11], leukoplakia [11, 12] and lichen planus [6] contribute to soft tissue manifestations seen in DC patients.

Dental extractions of such patients can lead to severe complications especially postoperative infection and difficulty in achieving haemostasis. The purpose of this case report is to highlight the preoperative and postoperative management of a DC patient with multiple dental extractions.

Case report

An 8.5-year-old boy, a known case of DC, was admitted to the pediatric ward, King Edward Memorial Hospital, Mumbai, India for high fever and he complained of dental pain and extra oral swelling. The diagnosis of this condition was made 6 months back when the patient complained of recurrent infections and his blood values were found to be fluctuating. The child first came to medical attention for urethral stenosis at two years of age for which dilatation procedure was done. Following that, at three years of age he developed whitish plaque like lesions on the buccal mucosa and tongue along with caries in the teeth. Biopsy of this lesion was suggestive of lichen planus which was treated with a trial of intralesional and oral steroids. However due to development of Cushingoid features as adverse effects, these drugs were discontinued by the patient and the lesions persisted. The elder male sibling also presented with similar oral lesions which responded to steroids. The child presented to our medical centre at eight years of age when the following features were noted in the background of the above history-pallor, short stature, microcephaly, alopecia, oral lichen planus, dental caries, hyperpigmented skin and dystrophy of the nails. Rest of the systemic examination was normal. The complete blood count revealed pancytopenia. Bone marrow biopsy suggested hypoplastic marrow with depression of all three cell lines. Telomere length analysis done by Cawthon method (a real time PCR based method for telomere length measurement) showed shortening of the telomere (2433 bp, T/S ratio 0.57) as compared to control (>2500 bp, T/S ratio 0.64). The telomere length analysis of both the sibling and their mother suggested shortening whereas father's was normal. A definitive diagnosis of Dyskeratosis Congenita was made. The child was referred for bone marrow transplantation but it wasn't feasible as the mother and sibling were affected and HLA typing of the father did not match with that of the child. Matched unrelated donor transplant was the only option available.

The child used to visit for regular checkups and was admitted at 8.5 years of age with complaints of fever and swelling over the right side of the face. The fever was high grade (>38.3 C) and continuous associated with neutropenia (ANC <500/dL) (febrile neutropenia), so empirical antibiotics were started immediately after collecting blood cultures. As the fever was not responding, antibiotics were stepped up to Imipenem- Cilastin and anifungal cover with fluconazole was added empirically. Furthermore, during the ward stay child complained of diminution of vision. Fundus examination revealed features of cytomegalovirus (CMV) retinopathy. Since the child was immunocompromised, so was started on intravenous gancyclovir therapy also.

Considering the poor health condition of the patient, referral to dental department was not conducive and he was thus examined at the bed

side in the ward itself. On general examination, the child was malnourished, showed an evident pallor, hypopigmented areas on the skin, dystrophy of the nails (figure 1), hyperkeratotic areas on the fingers and photophobia. Patient's elder brother also had the same condition but of a milder phenotype and the mother was a carrier of a recessive gene.

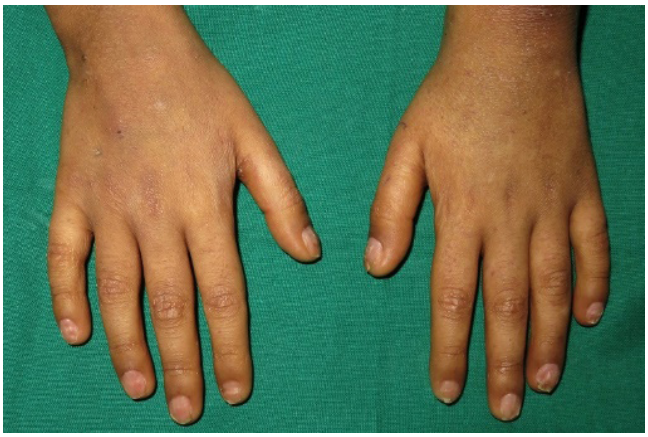
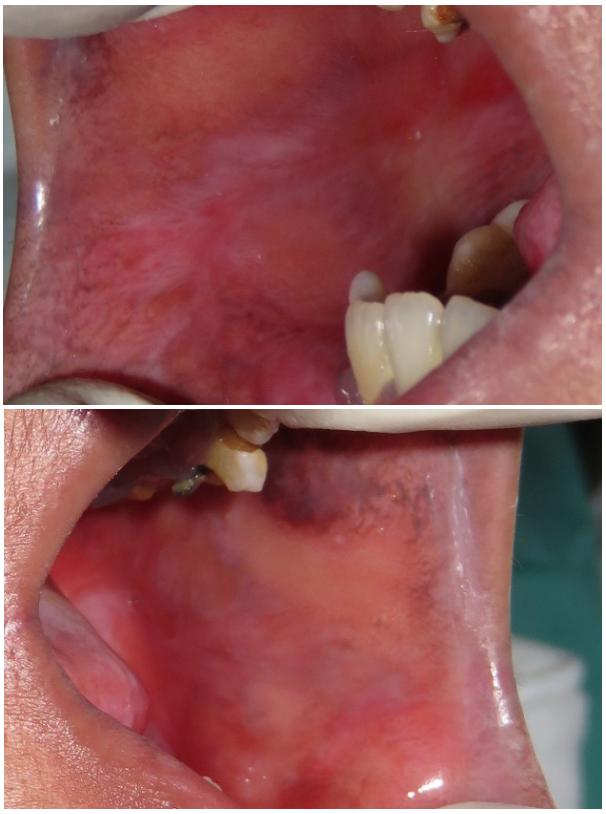


Figure 1 – Dystrophic nails and keratotic areas on fingers

The patient had an extra oral swelling on the right side of face, he also had severe oral stomatitis with erythema and ulceration of oral mucosa which was causing lot of discomfort and difficulty in mouth opening. Before performing detailed oral examination, patient was advised oral rinse with 2% lignocaine solution to achieve adequate topical anaesthesia of oral mucosa enabling comfortable oral examination. In routine procedures, topical anaesthetic gels and mouthwashes are recommended. But, in this case, patient complained of pain on application of the gel whereas gargle with anaesthetic mouthwash caused burning sensation (probably due to the flavouring agent). Thus, plain 2% lignocaine solution was used which, though bitter, was tolerated well by the patient. Examination of the oral tissues was done using mouth mirror coated with lignocaine jelly to avoid any injury to the fragile oral tissues. On oral examination whitish leukoplakia like lesions were present bilaterally on the buccal mucosa (figures 2 and 3). The tongue was smooth and erythematous with atrophy of the papillae (figure 4).



Figures 2 and 3 – Right and left buccal mucosa showing whitish lichen planus like lesion

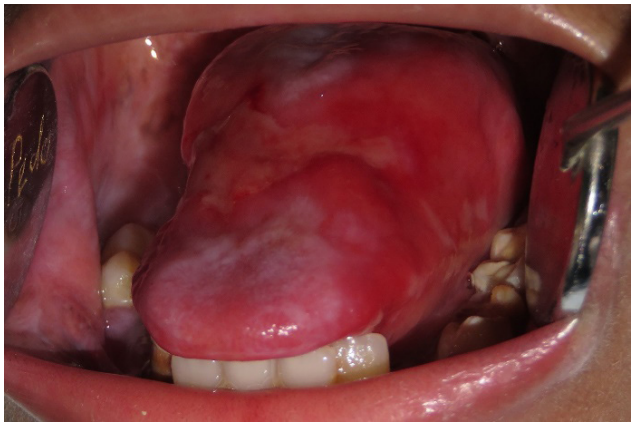
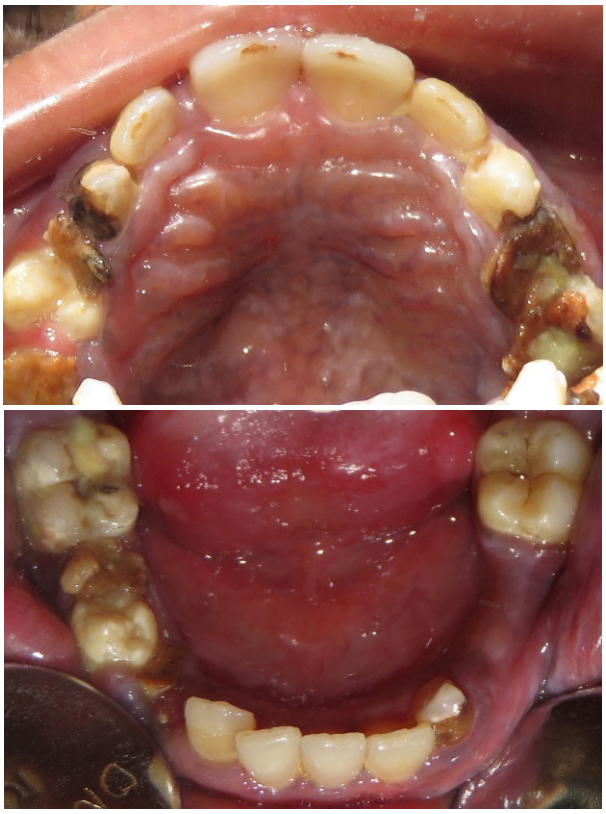


Figure 4 – Erythematous dorsum of tongue

Multiple carious teeth were present of which all the deciduous teeth were non-restorable (figures 5 and 6). The orthopantogram (panoramic radiograph) revealed short blunted roots of all the permanent molars and severe root resorption of most of the deciduous teeth (figure 7).



Figures 5 and 6 – Maxillary and mandibular arch showing multiple non-restorable deciduous teeth

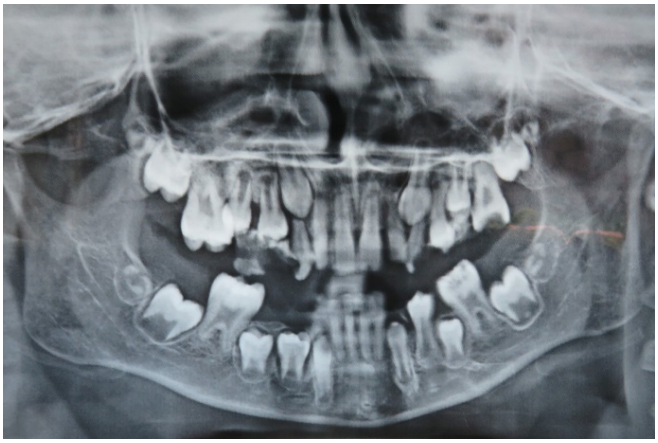


Figure 7 – Pre-operative Orthopantogram (panoramic radiograph)

The patient's parents were explained about the treatment procedure and risks and an informed consent was obtained. Extraction of primary maxillary right canine, primary maxillary right first molar, primary maxillary right second molar, primary mandibular right canine, primary maxillary left canine, primary maxillary left first molar, primary maxillary left second molar and permanent maxillary left first molar and permanent mandibular left first molar was planned under local anesthesia. Due to debilitating condition of the patient, dental treatment was scheduled in two visits at the bed side itself. We decided to perform extractions on the right side first followed by the left side on a later appointment.

Treatment phase I: A platelet transfusion was scheduled one hour prior to the dental procedure, patient also received tranexamic acid 500 mg and antibiotics (Imipenem-Cilastatin – 60 mg per kg per dose), ganciclovir (5 mg per kg per dose) were given as prophylaxis. Patient's haemoglobin on the day of extraction was 10.9 gm/dl, W.B.C count 1300/mm^3 and his Absolute Neutrophil Count (ANC) was 884. Primary maxillary right canine, primary maxillary right first molar, primary maxillary right second molar and primary mandibular right canine were extracted under local infiltration of 2% lignocaine with 1:100000 adrenaline solution. Local haemostasis was achieved by application of pressure packs and feracrylum gel (Sepgard gel, Themis medicare ltd.).

Treatment phase II: On the day of extraction, platelet count was 20,000/mm^3, ANC was 300 and haemoglobin was 4.3 gm/dl (table I). Because of low haemoglobin, packed red cell transfusion was scheduled immediately postextraction. Primary maxillary left canine, primary maxillary left first molar, primary maxillary left second molar and permanent maxillary left first molar and permanent mandibular left first molar were extracted using the same protocol as in treatment phase I.

Table I – Phases of treatment

Blood component	Unit	Pre-operative day 2	Pre-operative day 1	Day of extraction	Post-operative Day 1	Post-operative Day 2
Phase I of treatment						
WBC	/mm^3	900	840	1300	800	1000
HAEMOGLOBIN	gm/dl	8.8	8.2	10.9	7.9	4.7
ANC	/mm^3	630	550	884	480	600
PLATELET	/mm^3	20,000	25,000	60,000	54,000	40,000
Phase II of treatment						
WBC	/mm^3	1900	900	300	900	600
HAEMOGLOBIN	gm/dl	10.8	4.5	4.3	7.5	8.1
ANC	/mm^3	600	540	150	540	120
PLATELET	/mm^3	22,000	20,000	1,47,000	1,50,000	70,000

After the extraction of all grossly carious teeth, patient's fever spikes decreased to 38°C from its peak value of 39°C (figure 8). Patient tolerated both the treatment phases considerably well.

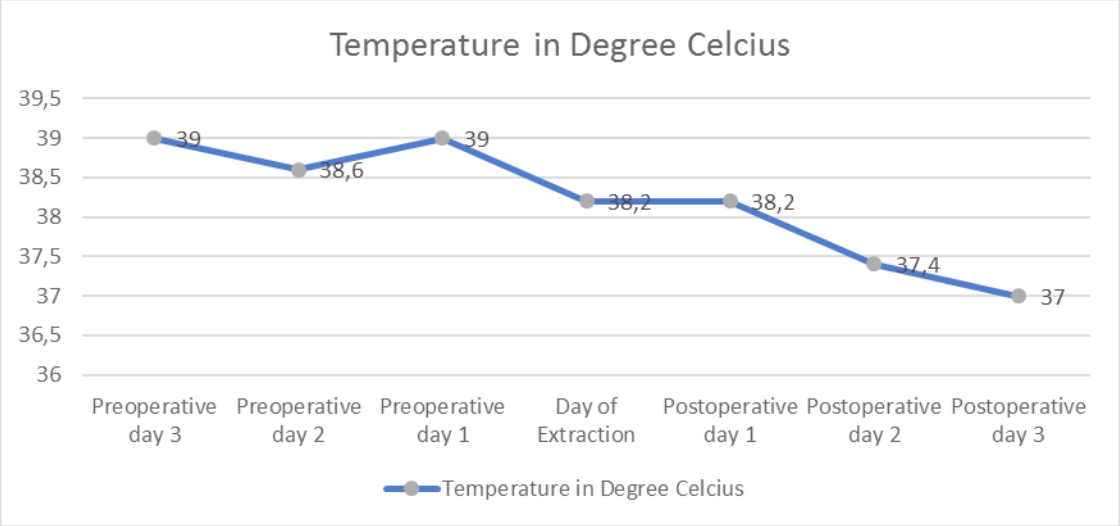


Figure 8 – Fever profile of the patient

There was no postoperative complication like bleeding or infection. Patient was discharged from the hospital after the full recovery. Unfortunately, the patient died after 15 days due to pulmonary and gastrointestinal haemorrhage, a part of the primary disease process.

Discussion

Blood and platelet transfusion is a routine procedure during and following major surgeries, but not after dental extractions. The present case demonstrates the dental management of an 8-year-old boy suffering from DC while maintaining the unstable blood parameters. The DC patients are more prone to infections because of low WBC counts. A simple procedure like extraction of a tooth can lead to severe complications. Brown reported that nearly 50% of deaths in cases of dyskeratosis congenita occur because of infection [1]. In this reported case, patient had platelet count 20,000/mm^3, in such situation it is advised to defer any dental procedure till the counts are above 50,000/mm^3 [10]. Our patient had pain and swelling in relation to primary maxillary right molars, because of which he had developed fever and it was affecting his general health.

The severity of patient's condition needed a multidisciplinary approach involving paediatrician, pedodontist and haematologist. Collective opinions and planning may help to decide the best for such medically compromised patients. Also, in our patient the paediatricians opined to remove carious and infected teeth which were affecting his systemic condition which was quiet evident from his constantly high fever profile (figure 8). Thus, the decision of extracting all carious pulpally involved teeth was made even though the platelet count was below 20,000. In DC patients, dental management especially extraction and minor surgical procedure will require hematologic preparation like reserving blood products, antibiotic prophylaxis and attention to potential bleeding problems in operative and post-operative stage. Objectives of the treatment should also focus on complete elimination of foci of infection. Extraction of pulpally involved teeth is preferred over pulp therapies like pulpotomy and pulpectomy. This should be followed by adequate haemostasis as patient's platelet counts are usually not within normal limits. In DC patients with no dental caries, preventive measures should be taken which will reduce further risk of dental caries, gingival bleeding and periodontal infections.

A case report by C.J. Brown in 2000 describes dental management of a child suffering from DC under local anaesthesia. He had listed dental findings seen in DC patient which were also seen in our case such as short blunted roots, gingival inflammation and bleeding, smooth atrophic tongue and infections in oral cavity. Several reports state that hypodontia and alveolar bone loss in molar incisor region mimicking juvenile periodontitis which was not present in our patient [1, 11].

As DC is a condition involving ectoderm with nail dystrophy as a finding in these patients [1, 4]. 88% of the patients show nail dystrophy [5]. In our patient dyskeratotic changes of fingernails was present also known as "senile nails" [11]. The common features also include skin atrophy and other abnormalities such as wrinkled skin over the dorsum of hands and feet, hyperhidrosis and hyperkeratosis of the palms and soles with the disappearance of fingerprints.

Loh *et al*. [6] had reported lichen planus in buccal mucosa and it was assumed that it was a part of sequence of events in development of leukoplakia. In our case, whitish lesion resembling leukoplakia was seen on right buccal mucosa which is one of the principle clinical findings in DC patients [11]. The patient also had severe stomatitis which made examination difficult. Patient was not even able to maintain oral hygiene because of burning sensation. Topical anaesthetic gels and sprays didn't help relieve burning sensation completely. Local anaesthetic solution gargles helped to anesthetise the oral mucosa to certain extent, such that while working on one side under local anaesthesia, the other side did not feel any stimulus. DC patients are immune compromised and are prone to infections because of low blood cell counts. A dental focus of infection is difficult to battle because of lowered immunity. Our patient used to get fever spikes usually 39°C and above preoperatively. After removal of dental foci of infection, the fever graph was at baseline temperature of 38°C. A dental surgeon should be aware of such condition and its dental management. The deteriorating blood picture and compromised immunity may not allow an ideal approach to dental rehabilitation but, an interdisciplinary approach involving pediatric dentists and paediatrician can enable patients to lead a better quality of life.

Regular follow up and thorough supervision of oral hygiene of these patients is very important owing to their compromised immunological condition. Early detection of any possible foci of infection can help to reduce the suffering of DC patients.

References

1. Brown CL. Dyskeratosis congenita: report of a case. International Journal of Paediatric Dentistry. 2000 Dec 1;10(4):328-34.

2. Cannell H. Dyskeratosis congenita. British Journal of Oral Surgery. 1971 Jul 1;9(1):8-20.

3. Davidovich E, Eimerl D, Aker M, Shapira J, Peretz B. Dyskeratosis congenita: dental management of a medically complex child. Pediatric Dentistry. 2005 May 1;27(3):244-8.

4. Dokal I. Dyskeratosis congenita: an inherited bone marrow failure syndrome. British Journal of Haematology. 1996 Mar 1;92(4):775-9.

5. Koruyucu M, Barlak P, Seymen F. Oral and dental findings of dyskeratosis congenita. Case Reports in Dentistry. 2014;2014.

6. Loh HS, Koh ML, Giamj YC. Dyskeratosis congenita in two male cousins. British Journal of Oral and Maxillofacial Surgery. 1987 Dec 1;25(6):492-9.

7. Ogden GR, Connor E, Chisholm DM. Dyskeratosis congenita: report of a case and review of the literature. Oral Surgery, Oral Medicine, Oral Pathology. 1988 May 1;65(5):586-91.

8. Sanders BJ, Shapiro AD, Hock RA, Manaloor JJ, Weddell JA. Management of the medically compromised patient: hematologic disorders, cancer, hepatitis, and Aids. McDonald and Avery's Dentistry for the Child and Adolescent. 2016:540-562.

9. Sirinavin C, Trowbridge AA. Dyskeratosis congenita: clinical features and genetic aspects. Report of a family and review of the literature. Journal of Medical Genetics. 1975 Dec 1;12(4):339-54.

10. Steier W, Van Voolen GA, Selmanowitz VJ. Dyskeratosis congenita: relationship to Fanconi's anemia. Blood. 1972 Apr 1;39(4):510-21.

11. Wald C, Diner H. Dyskeratosis congenita with associated periodontal disease. Oral Surgery, Oral Medicine, Oral Pathology. 1974 May 1;37(5):736-44.

12. Yavuzyilmaz E, Yamalik N, Yetgirr S, Kansu Ö. Oral-dental findings in dyskeratosis congenita. Journal of Oral Pathology & Medicine. 1992 Jul 1;21(6):280-4.