International Journal of Paediatric Dentistry 2004; **14:** 355–362

Dental treatment for children with chronic idiopathic thrombocytopaenic purpura: a report of two cases

B. VAISMAN, A. C. MEDINA & G. RAMIREZ
Universidad Central de Venezuela Dental School, Caracas, Venezuela

Summary. Idiopathic thrombocytopaenic purpura (ITP) is the most common acquired bleeding disorder occurring in previously healthy children. The condition is benign and self-limiting, with a high possibility of recovery. Only 15–30% of children with acute ITP develop the chronic form. Clinically, ITP presents with petechiae, ecchymoses, haematomas, epistaxis, haematuria, mucocutaneous bleeding, and occasionally, haemorrhage into tissues. Oral manifestations include spontaneous gingival bleeding, petechiae or haematomas of the mucosa, tongue or palate. Two paediatric case reports are described concerning female patients diagnosed with chronic ITP. Oral findings and dental procedures are described. Standard dental treatment was performed with a platelet count higher than 50 000/mm^3. The importance of adequate dental plaque control techniques in order to prevent inflammation, potential bleeding and infection in these patients is emphasized. The paediatric dentist must be aware of the clinical appearance of ITP in order to recognize the condition and successfully manage the patient.

Introduction

Idiopathic thrombocytopaenic purpura (ITP) is the most common of the thrombocytopaenias of childhood [1,2]. Clinical manifestations include petechiae, ecchymoses, mucocutaneous bleeding, and occasionally, haemorrhage into tissues. Complications are rare. Few cases have been reported in the dental literature [1,2–6]. The paediatric dentist must be aware of the clinical appearance of ITP in order to recognize the condition and successfully manage the patient. Two paediatric case reports of females with ITP are described.

Case report

Case 1

A 5-year-old female presented at the Paediatric Dentistry Department at the Universidad Central de Venezuela Dental School, Caracas, Venezuela, for dental treatment.

Medical history revealed that she had been diagnosed with acute ITP at 3 months of age, and her platelet count was 20 000/mm^3. She was hospitalized in the paediatric intensive care unit, and treated with platelet transfusion and corticosteroids. Her platelet count was maintained at 145 000/mm^3. The acute ITP developed in chronic ITP.

Previous dental history revealed that, at the age of 3 years, the subject had been treated for early childhood caries by extraction of 54, 53, 52, 51, 61, 62, 63, 64, 75, 74, 72, 71, 81, 82 and 84 under general anaesthesia.

The patient was referred to the Paediatric Dentistry Department at 5 years of age with normal haematological results and a platelet count of 170 000/mm^3. Extra-oral evaluation at this stage revealed bruises of varying ages on all limbs (Fig. 1). There was no splenomegaly or hepatomegaly. Intra-oral evaluation (Fig. 2) revealed extensive carious lesions of 55, 65, 73 and 85. There was bleeding when probing the gingival sulcus and petechiae were evident on the palate, in spite of having a platelet count above

Correspondence: Beatriz Vaisman, Bamco CCS-240, PO Box 522237, Miami, FL 33152, USA. E-mail: bianvais@telcel.net.ve

© 2004 BSPD and IAPD

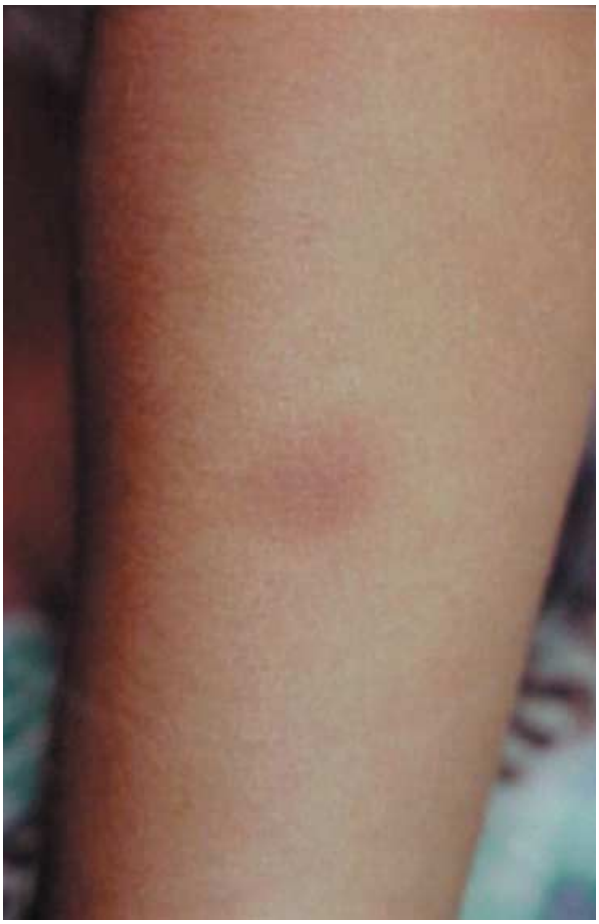

Fig. 1. Physical evaluation of case 1: bruising of the arm at 5 years of age.

50 000/mm^3. Vertical dimension was diminished, producing anterior displacement of the mandible and a pseudo class III relationship. There was no abnormal or pathological finding in the radiographic evaluation (peri-apical and panoramic views), apart from carious lesions. Dental age corresponded with chronological age [7].

Dental treatment was performed consisting in composite reconstruction of 73, and formocresol pulpotomy of 55, 65 and 85. Proper oral hygiene techniques were taught to the child and her parents, and their implementation was monitored throughout treatment. Dietary recommendations were made. Large sub-mucosal haematomas were observed with injection of infiltrative anaesthesia. The time for pulpal fixation with formocresol was under 5 min [8], in accordance with guidelines established for healthy patients. There was mild, localized bleeding of the gingival sulcus with minimal stimuli, and sites of bleeding were evident one week after treatment.

New haematological tests were performed, detecting that the platelet count was depressed to 30 000/mm^3. Dental treatment was postponed. The patient was treated with corticosteroids and her platelet count rose to 130 000/mm^3. Dental treatment was resumed after 2 months. Final rehabilitation included stainless steel crowns and prosthetic space maintainers. Even though acrylic borders were rounded and not overextended, petechiae and sub-mucosal haematomas were produced with the appliances; in order to avoid tissue damage, a soft base material was used to line them. No further complications were observed.

At 11 years of age, the patient returned for evaluation. Her platelet count had remained low but stable over the years (145 000/mm^3). Bruising of the limbs (Fig. 3) and easily bleeding gingiva were the only manifestations of ITP evident at this time. Intra-oral findings included carious lesions of 11, 26 and 36, and class I type 3 and 5 malocclusion. No radiographic abnormalities were observed. Dental treatment included topical fluoride application, pit and fissure sealants, composite restorations (Fig. 4), and interceptive orthodontics (an upper active expansion plate using a Hawley buccal arch, Adam's clasps on 16 and 26, and a palatal spring to 12 and lower lingual arch). Special care was taken when adapting the orthodontic bands in order not to produce bleeding. No complications were observed.

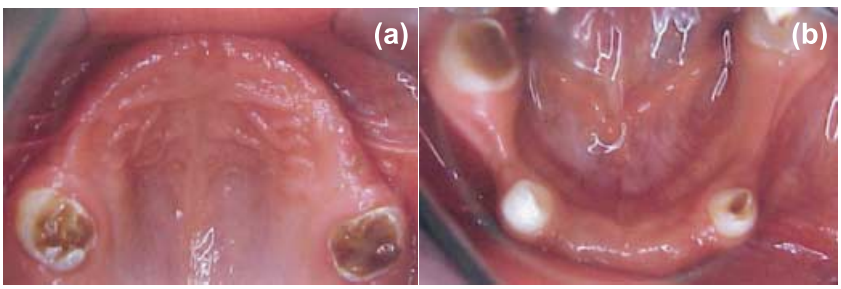

Fig. 2. Intra-oral aspect of case 1: (a) petechiae of the palate; and (b) carious lesions at 5 years of age.

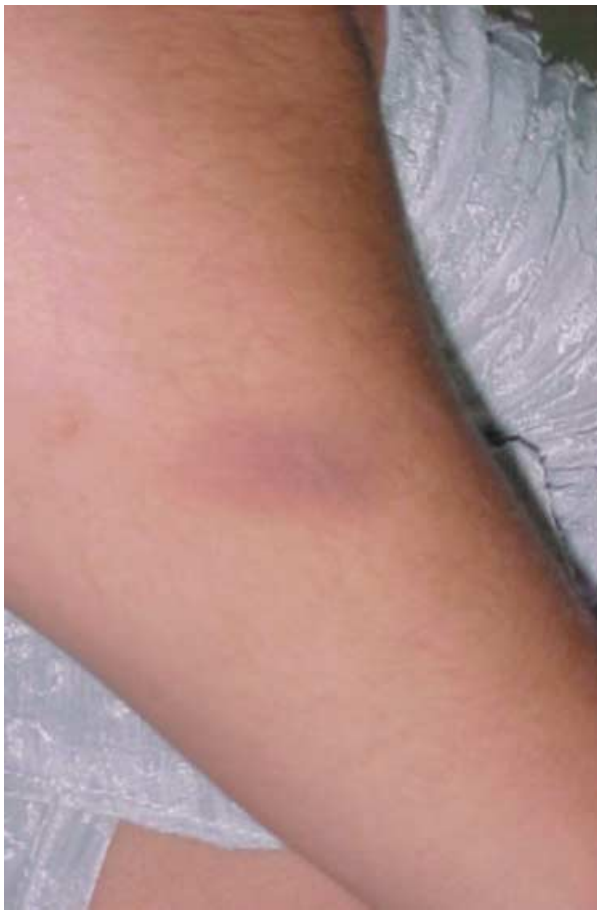

Fig. 3. Physical evaluation of case 1: bruising of the arm at 11 years of age.

Case 2

A 7-year-old female presented at the Paediatric Dentistry Department at the Universidad Central de Venezuela Dental School for dental treatment, referred from the Haematology Department of the University Hospital (Hospital Clínico Universitario).

Medical history revealed that the patient had suffered from several upper airway infections and a lower urinary tract infection, which were all treated with antibiotics (cephalosporin). She was diagnosed at 5 years of age with ITP after presenting with ecchymoses on the right hip, bruises on her legs, arms and back, and a platelet count of 54 000/mm^3. At the time of first diagnosis, she was treated with corticosteroids for one month, briefly improving platelet count. Afterwards, platelet count dropped to 25 000/mm^3 and corticosteroid treatment was resumed. Chronic ITP was diagnosed. The patient was kept under close observation, without treatment for 15 months. The platelet count remained under 25 000/mm^3 and corticosteroid treatment was resumed (2·5 mg prednisone daily).

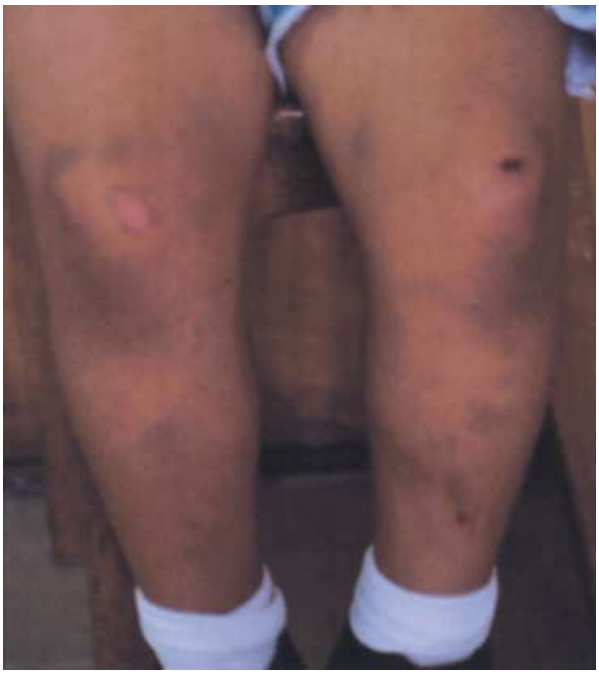

Fig. 5. Physical evaluation of case 2: bruising of the legs.

Extra-oral evaluation at 7 years of age (Fig. 5) revealed bruises of varying ages on all limbs. There

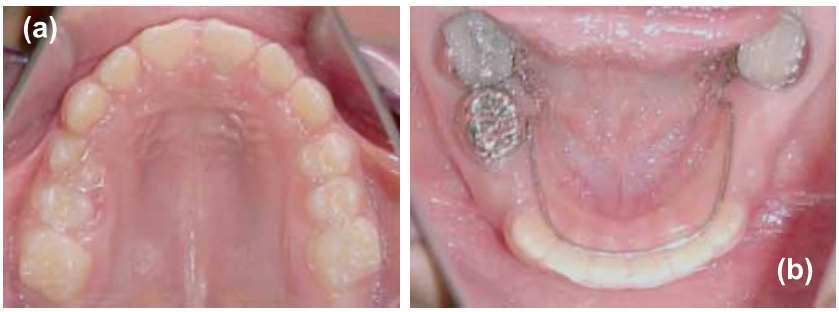

Fig. 4. Intra-oral aspect of case 1 at 11 years of age: (a) upper; and (b) lower arch.

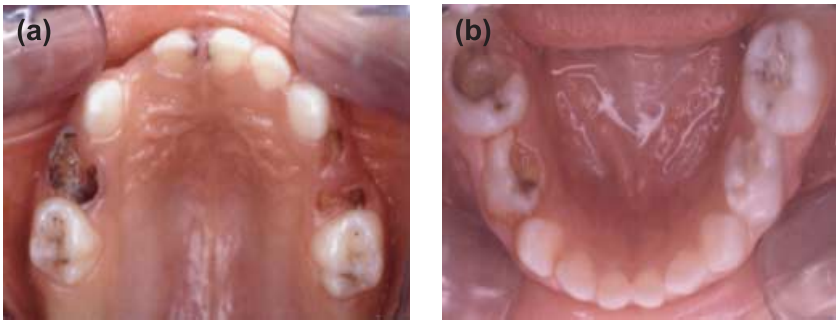

Fig. 6. Initial intra-oral aspect of case 2: (a) upper; and (b) lower arch.

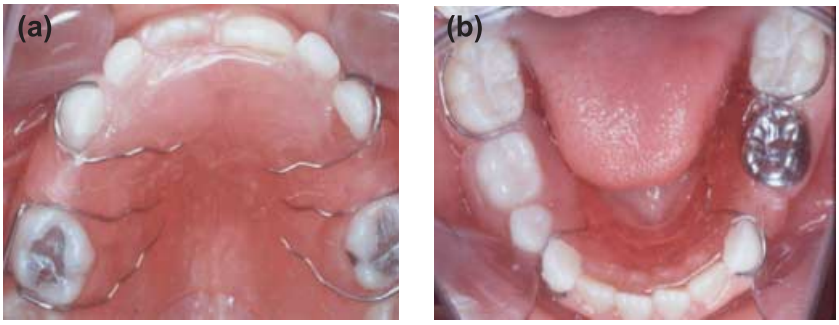

Fig. 7. Final intra-oral aspect of case 2: (a) upper; and (b) lower arch.

was no splenomegaly or hepatomegaly. Right cervical lymph nodes were palpable, mobile and not painful. Haematological results indicated mild anaemia (haemoglobin = 10·5 g/dL), a low platelet count (54 000/mm^3), and tested positive for IgG and IgM anti-platelet antibodies.

Intra-oral evaluation (Fig. 6) revealed poor oral hygiene, gingival swelling, and extensive carious lesions of 51, 54, 55, 61, 64, 65, 74, 75, 84 and 85. No oral manifestations of ITP were evident. Radiographic evaluation (peri-apical and panoramic views) demonstrated dental abscesses of 64, 74, 84 and 85. Dental age corresponded with chronological age [7]. Dental treatment was performed, consisting of: composite reconstruction of 61; amalgam restoration of 55 and 65; formocresol pulpotomy and stainless steel crown of 75; extraction of 51, 54, 64, 81, 84 and 85; and aesthetic upper and lower removable space maintainers (Fig. 7). Proper oral hygiene techniques were demonstrated and the importance of their use was emphasized. Dietary recommendations were made.

At 9 years of age, the patient returned for evaluation. No oral manifestations of ITP were visible. Her platelet count had remained low. She continued corticosteroid therapy, but because of a lack of response, splenectomy was being considered as a necessary option.

Discussion

Idiopathic thrombocytopaenic purpura is the most common acquired bleeding disorder occurring in previously healthy children. It occurs in four out of 100 000 children per year, equally affecting boys and girls between 2 and 4 years of age [9,10]. The condition is benign and self-limiting, with a high possibility of recovery [11,12]. It is considered to be an autoimmune disorder because of the anti-platelet antibodies which coat the platelet, and lead to its phagocytosis and destruction by the reticulum endothelial system, mainly the liver and spleen [13,14].

Idiopathic thrombocytopaenic purpura can be classified in two major forms. The acute form affects children and young adults [5,15]. In a Venezuelan sample of 186 children with ITP, the acute form of the disease affected 80% [16]. The condition may occur as an immune response to sensitization by an antecedent viral infection in which platelets are somehow affected by the immune response to the primary infection. Anti-platelet antibodies have been detected in proportion to platelet destruction and the antibodies decrease after recovery from the condition [17]. The interval between infection and onset is 2–21 days [1]. Acute ITP has also been related to Epstein–Barr [18] and varicella zoster [19] virus

infections, upper airway infections [1], otitis media [20], streptococcal infections (acute glomerulonephritis) [21], and vaccination (after measles-mumps-rubella vaccination) [22,23].

Chronic ITP develops in 15–30% [11,24–26] of children with acute ITP, and females are most affected (female:male ratio = 3:1). Pathophysiology of this condition suggests an autoimmune process and a disregulated immune response [27], which may remit over time in 80% of cases [11,28]. Clinical symptoms are generally milder.

The clinical features of ITP include petechiae, ecchymoses, haematomas, epistaxis, haematuria, mucocutaneous bleeding, and occasionally, haemorrhage into tissues. Apart from the signs of bleeding, the patients are otherwise well, and there is generally no enlargement of the liver, spleen or lymph nodes [1,5], even though the spleen tip may be palpable in about 10% of patients with acute ITP [29].

Idiopathic thrombocytopaenic purpura may frequently involve the oral mucosa. Oral manifestations include petechiae, ecchymoses or haematomas in easily traumatized areas such as the buccal mucosa, lateral borders of the tongue, and the limit between the soft and hard palate. Other findings are spontaneous gingival and mucocutaneous bleeding (2, 9, 3, 4, 6, 30, 31, and 32), and haemorrhagic bullae [5].

Haematological results show a severely depressed platelet count (below 20 000/mm^3 in acute ITP, and between 30 000 and 100 000/mm^3 chronic ITP [5]), abnormal bleeding time and clot retraction. White cell count is normal and anaemia is only present when significant blood loss has occurred [1]. The severity of clinical findings may be independent of the severity of platelet deficiency. Platelet-associated antibodies have been detected in 75% of patients with ITP. Serum anti-platelet IgG antibodies are detected in 50–85% of patients. The newest generation of anti-platelet antibody assays appears to be more promising for confirmation of diagnosis, but as long as these tests are not available for routine diagnostic use, diagnosis in a patient with insidious ITP will continue to be by exclusion [33]. Alterations in the bone marrow are limited to the megacariocytes, which are usually increased in size and are plentiful, their number correlating roughly with the mean platelet volume [29].

Complications are rare and mainly include intracranial haemorrhage (0·1–0·9%) [11]. Sub-glottic airway haemorrhage has also been reported [34].

Although the clinical course may be alarming, mortality is low and prognosis is excellent [35], with 80–90% [11] rates of complete remission, irrespective of treatment. Some authors have recommended adequate parental education, restrictions of lifestyle and in the absence of severe haemorrhages, monitored waiting without specific therapy [25,36,37]. If treatment is considered necessary, it may include corticosteroids, intravenous immunoglobulin or intravenous anti-D immunoglobulin for acute episodes. All these treatments are associated with potentially serious side-effects, and careful consideration of the balance of risks is vital [25]. Splenectomy may be necessary for a small proportion of patients with chronic ITP that has proved resistant to therapy [11,25,25].

In both cases described here, the patients were females first diagnosed with acute ITP who were treated for a short period of time with corticosteroids. Platelet count improved, but remained low. Several relapses were observed through time, leading to the diagnosis of chronic ITP.

In case 1, diagnosis was made by exclusion, whereas in case 2, diagnostic confirmation was made with positive IgG and IgM anti-platelet antibodies.

In case 1, the patient sustained a low but stable platelet count without receiving specific therapy for ITP and the condition remains self-limiting. Clinically, she continued to show evidence of bruising of the limbs and mild oral manifestations (i.e. gingival bleeding when probing the sulcus, and haematomas with injection for infiltrative local anaesthesia or following minor trauma to the oral tissues) in spite of her platelet count.

In case 2, the patient received prolonged corticosteroid treatment. Platelet count remained low and splenectomy was considered to be necessary. The patient did not evidence oral manifestations of ITP; however, she did present bruising of the limbs.

Dental procedures were standard for both patients, and were performed with a platelet count over 50 000/mm^3 and in consultation with the patient's physician. Special care was taken in not overextending or traumatizing the oral tissues, puncturing only once when injecting anaesthesia, and carefully adapting space maintainers and avoiding over-activation of orthodontic appliances.

Individualized caries prevention protocols should be designed for each patient according to caries risk and age [38]. Preventive measures may include dietary counselling, plaque control, fluoride toothpaste (500 p.p.m.), topical fluoride gel or varnish application, clorhexidine varnish application, pit and fissure

sealants, and fluoride or clorhexidine mouth rinses [39]. In both cases, the preventive measures used were: dietary recommendations (reduction of complex sugar consumption) [40]; plaque control; fluoride toothpaste; topical fluoride gel application; and pit and fissure sealants. It was not necessary to prescribe systemic fluoride supplements because salt in Venezuela is fluoridated (concentration = 200–220 p.p.m.) [41,42,43].

Restorative and endodontic treatments are the treatments of first choice in all patients with disorders of haemostasis, but this is not always possible. In both cases reported here, simple extractions of primary teeth were performed without complication and no additional haemostatic aids proved necessary. Special precautions do need to be taken concerning oral surgical procedures in patients with ITP. Platelet count must be higher than 50 000/mm^3. In cases where bleeding is present, primary mucosal closure of wound sites is the first step in controlling bleeding; gauze compression and local injection of a vasoconstrictor are also helpful. Dental extraction sites may be packed with absorbable gelatine sponges (Gelfoam®), microfibrilar collagen (Avitene®) [44] or oxidized regenerated cellulose (Surgicel®). Bone bleeding can be addressed directly by bone burnishing, electrocautery or by application of bone wax. Gauze or Gelfoam® can be adjunctively soaked with epsilon aminocaproic acid to help preserve the blood clot [45]. Patients with a platelet count lower than 50 000/mm^3 require platelet transfusion or corticosteroid treatment prior to surgery [30,44].

Marrow production of platelets may be disturbed by drugs, toxins, nutritional deficiencies, infections and infiltrative diseases, resulting in purpuric haemorrhages. Differential diagnosis of ITP must be made with drug-induced thombocytopaenias (e.g. barbiturates, phenylbutazone, sulphur drugs, quinine or prolonged glucocorticoid therapy), hereditary thombocytopaenias (e.g. von Willembrand disease, Wiskott–Aldrich syndrome, Bernard–Soulier syndrome or Henoch–Schlonlein purpura), vitamin C deficiency, viral infections (e.g. HIV, Mononucleosis, Hepatitis), autoimmune disorders (e.g. systemic erithematous lupus), aplastic anaemia, acute leukaemia or non-Hodgkins lymphoma [1,5,6,25,46,47].

Conclusions

The paediatric dentist must be aware of the clinical appearance of ITP in order to recognize the condition and successfully manage the patient. A thorough medical history, including questions about bleeding manifestations and drug ingestion, should be taken. If any acute clinical features are detected, the patient must be referred to the paediatric haematologist/oncologist for a comprehensive diagnosis. Elective dental treatment should be postponed until the platelet count rises.

Prescription of drugs with anti-platelet aggregation effect (such as aspirin and ibuprofen) must be avoided. Consultation with the treating physician to determine the severity of the disorder and the need for special preparations for dental treatment is recommended. Successful dental treatment for patients with ITP must be interdisciplinary.

In patients with chronic ITP, routine dental treatment must be performed with a platelet count above 50 000/mm^3 [3,30]. In cases with less than 50 000/mm^3, platelet transfusion or corticosteroid treatment is necessary prior to oral surgery.

The importance of adequate dental plaque control techniques in order to prevent inflammation, potential bleeding and infection in these patients must be carefully stressed. Individualized caries prevention protocols, in relation with the patient's caries risk, must be applied. Measures may include: the use of fluoridated toothpaste; dietary recommendations (e.g. low sugar ingestion); daily fluoride mouthwashes (for children aged 6 years and over at high risk of caries); systemic fluoride supplements (in areas with sub-optimal water or salt fluoridation) and procedures at the dental office such as fluoride or clorhexidine application, and pit and fissure sealants.

The paediatric dentist may perform standard dental procedures, taking special care not to traumatize the oral tissues by minimizing needle puncturing, and carefully adapting and activating orthodontic appliances.

Dental restoration and endodontic treatment are to be preferred when possible, rather than surgical options. Where this is essential, helpful measures in order to achieve adequate haemostasis in minor oral surgical procedures are: primary mucosal closure of surgical wounds; the use of gauze packs, absorbable gelatine sponges (Gelfoam®), microfibrilar collagen (Avitene®) or oxidized regenerated cellulose (Surgicel®); electrocautery; or the application of bone wax. Antibiotics used in conjunction with treatment reduce the possibility of postoperative infection.

Acknowledgements

The authors wish to extend their thanks to Dr Joaquín Inaty for his kind cooperation and advice regarding this manuscript.

Résumé. Le purpura thrombocytopénique idiopathique (ITP) est le désordre de saignement acquis le plus courant survenant chez l'enfant sain. Ce problème est bénin et auto-limitant avec une forte éventualité de guérison. Seuls 15 à 30% des enfants avec ITP aigu développent la forme chronique. D'un point de vue clinique, l'ITP se manifeste sous la forme de pétéchies, ecchymoses, hématomes, épistaxis, hématurie, saignements muco-cutanés et occasionnellement hémorragies intra-tissulaires. Les manifestations buccales incluent des gingivorragies spontanées, des pétéchies et hématomes de la muqueuse, au niveau de la langue ou du palais. Deux cas chez l'enfant sont décrits concernant des jeunes filles avec ITP chronique diagnostiqué. Les données buccales et les procédures dentaires sont décrites. Les traitements dentaires standards ont été effectués avec un compte plaquettaire supérieur à 50 000/mm^3. L'accent est mis sur l'importance de techniques adéquates de contrôle de la plaque dentaire afin de prévenir chez ces patients l'inflammation, les saignements potentiels et les infections. Les dentistes pédiatriques doivent connaître l'aspect clinique de l'ITP afin de reconnaître la maladie et de prendre en charge avec succès le patient.

Zusammenfassung. Idiopathische thrombozytopenische Purpura (ITP) ist die häufigste erworbene Blutungsneigung bei zuvor gesunden Kindern. ITP ist benigne und selbstlimitierende mit eine hohen Rate der Spontanheilung. Nur rund 15%–30% der Kinder mit akuter ITP entwickeln eine chronische Form. Klinisch zeigen sich Petechien, Ecchymosen, Hämatome, Nasenbluten, Hämaturie, mukokutane Blutungen und gelegentlich Blutungen ins Gewebe. Orale Manifestationen umfassen spontane Gingivablutung, Petechien oder Hämatome von Mukosa, Zunge oder Gaumen. Zwei Fallberichte werden vorgestellt mit Patientinnen mit chronischer ITP. Mundbefunde und Zahnbehandlung werden beschrieben. Standardbehandlungen wurden bei Plättchenzahlen über 50000/mm durchgeführt. Die Bedeutung einer adäquaten Plaquekontrolle um Entzündung, potentielle Blutung und Infektion zu vermeiden wird hervorgehoben. Als Kinderzahnarzt muss man das Krankheitsbild der ITP und seine klinischen Implikationen kennen, um diese Bedingung zu erkennen und die Patienten erfolgreich behandeln zu können.

Resumen. La púrpura trombocitopénica idiopática (ITP) es el desorden hemorrágico adquirido más común que aparece en niños previamente sanos. La alteración es benigna y autolimitada con una alta posibilidad de recuperación. Sólo de un 15 a un 30% de los niños con ITP aguda desarrollan la forma crónica. Clínicamente la ITP se presenta con petequias, equímosis, hematomas, epistaxis, hematuria, sangrado mucocutáneo y ocasionalmente hemorragias en tejidos. Las manifestaciones bucales incluyen sangrado gingival espontáneo, petequia o hematomas de la mucosa, lengua o paladar. Se describen los informes de dos casos pediátricos concernientes a pacientes del sexo femenino diagnosticadas de ITP crónica. Se describen los hallazgos orales y los procedimientos dentales. El tratamiento odontológico estándar se realizó con un recuento plaquetario mayor de 50,000/mm^3. Se enfatiza la importancia de unas técnicas de control de placa dental adecuadas para prevenir la inflamación, el sangrado potencial y la infección en estos pacientes. El Odontopediatra debe conocer las manifestaciones clínicas de la ITP para reconocer la alteración y tratar con éxito al paciente.

References

1 Hunter ML, Hunter B, Lesser S. Acute idiopathic thrombocytopaenic purpura in childhood: report of a case presenting in general dental practice. *British Dental Journal* 1997; **183** (1): 27–29.
2 Reddy VV, Rawal YB. Childhood thrombocytopenic purpura: review and case report. *Indian Journal of Dental Research* 1996; **7**: 103–106.
3 Thoma KH, Holland DJ, Woodbury HW, *et al*. Thrombocytopenic purpura associated with bleeding from the gingiva. *Oral Surgery* 1948; **1**: 12.
4 Linenburg WB. Idiopathic thrombocytopenic purpura: report of a case. *Oral Surgery* 1964; **17**: 22–30.
5 James WD, Guiry CC, Grote WR. Acute idiopathic thrombocytopenic purpura. *Oral Surgery* 1984; **57**: 149–151.
6 Ripamonti U, Petit J-C, Penfold G, Lemmer J. Periodontal manifestations of acute autoimmune thrombocytopenic purpura. A case report. *Journal of Periodontology* 1986; **57**: 429–432.
7 Van Der Lynden F. *Development of the Dentition*. Chicago, IL: Quintessence Publishing, 1983: 167–169.
8 Dean JA, Mac KRB, Fulkerson BT, Sanders BJ. Comparison of electrosurgical and formocresol pulpotomy procedures in children. *International Journal of Paediatric Dentistry* 2002; **12**: 177–182.
9 Barnard K, Smallridge J. Recognizing and caring for the medically compromised child: 2. Hematological disorders. *Dental Update* 1998; **25**: 402–410.

10 George JH, Woolf SH, Raskob GE. Idiopathic thrombocytopenic purpura: a guideline for diagnosis and management of children and adults. American Society of Hematology. *Annals of Medicine* 1998; **30**: 38–44.
11 Gadner H. Management of immune thrombocytopenic purpura in children. *Review of Clinical Experimental Hematology* 2001; **5**: 201–221.
12 Tarantino MD. Acute immune (idiopathic) thombocytopenic purpura in childhood. *Blood Review* 2002; **16**: 19–21.
13 Burns TR, Saleem A. Idiopathic thrombocytopenic purpura. *American Journal of Medicine* 1983; **75**: 1001–1007.
14 Mitzutani H, Furubayashi T, Imai Y, Honda S, Take H, Kyrata Y, Yonezawa T, Tarui S, Ikehara S. Mechanisms of corticosteroid action in immune thrombocytopenic purpura (ITP): experimental studies using ITP-prone mice (NZW × BXSB) F_1. *Blood* 1992; **79** (4): 942–947.
15 Lowe EJ, Buchanan GR. Idiopathic thrombocytopenic purpura diagnosed during the second decade of life. *Journal of Pediatrics* 2002; **141**: 253–258.
16 Suárez M, Camarillo W. Púrpura Trombocitopénica Idiopática en Niños. *Boletín Hospital JM de Los Ríos* 1988; **24**: 39–42.
17 Ozsoylu S, Karabent A, Irken G, Tuncer M. Antiplatelet antibodies in childhood idiopathic thombocitopenic purpura. *American Journal of Hematology* 1991; **36**: 82–85.
18 Hsiao CC. Epstein–Barr virus associated with immune thrombocytopenic purpura in childhood. *Journal of Paediatrics and Child Health* 2000; **36**: 445–448.
19 Wright JF, Blanchette VS, Wang H, Arya N, Petri M, Semple JW, Chia WK, Freedman J. Characterization of platelet-reactive antibodies in children with varicella-associated acute immune thrombocytopenic purpura (ITP). *British Journal of Haematology* 1996; **95**: 145–152.
20 Sale K, Brown E, Halstead L. Idiopathic thrombocytopenic purpura presenting as postmyringotomy hemorrhage. *Archives of Otolaryngology and Head and Neck Surgery* 1999; **125**: 1383–1384.
21 Muguruma T, Koyama T, Kanadani T, Furujo M, Shiraga H, Ichiba Y. Acute thrombocytopenia associated with post-streptococcal acute glomerulonephritis. *Journal of Paediatrics Child Health* 2000; **36**: 401–402.
22 Jonville-Béra AP, Autret E, Galy-Eyraud C, Hessel L. Thonbocytopenic purpura after measles, mumps and rubella vaccination: a retrospective survey of French regional pharmacovigilance centres and Pasteur-mérieux serums and vaccines. *Pediatric Infectious Diseases Journal* 1996; **15**: 44–48.
23 Nieminen U, Peltola H, Syrjälä MT, Mäkipernaa A, Kekomäki R. Acute thrombocytopenic purpura following measles, mumps and rubella vaccination. A report on 23 patients. *Acta Paediatrica* 1993; **82**: 267–270.
24 Nugent DJ. Childhood immune thombocytopenic purpura. *Blood Review* 2002; **16**: 27–29.
25 Bolton-Maggs PH. Idiopathic thombocytopenic purpura. *Archives of Diseases of Children* 2000; **83**: 220–222.
26 Blanchette V. Childhood chronic immune thombocytopenic purpura (ITP). *Blood Review* 2002; **16**: 23–26.
27 Kühne Y, Imbach P. Chronic immune thrombocytopenic purpura in childhood. *Seminars of Thrombosis and Hemostasis* 1998; **24**: 549–553.
28 Winiarski J. Mechanisms in childhood idiopathic thrombocytopenic purpura (ITP). *Acta Paediatrica Supplement* 1998; **424**: 54–56.
29 Parker Levine S. Thrombocytopenia caused by immunologic platelet destruction. In: Lee R, Forester J, Lukens J (eds). *Wintrobe's Clinical Hematology*, 10th edn. Philadelphia, PA: Williams & Williams, 1993: 1583–1611.
30 Little JW, Falace DA. *Dental Management of the Medically Compromised Patient*, 4th edn. St Louis, MO: Mosby, 1993: 423–438.
31 Shafer W, Hine M, Levy B. *Tratado de Patología Bucal*, 2nd edn. México, México: Nueva Editorial Latinoamericana, 1986: 777–779.
32 Regezi JA, Sciubba JJ. *Patología Bucal*. México, México: Nueva Editorial Latinoamericana, 1991: 154–156.
33 McMillan R. Clinical role of antiplatelet antibody assays. *Seminars of Thrombosis and Hemostasis* 1995; **21**: 37–45.
34 Sadowitz D, Terndrup TE. Subglottic airway hemorrhage associated with idiopathic thrombocytopenic purpura. *Annals of Emergency Medicine* 1994; **23**: 591–595.
35 McWilliams NB, Maurer HM. Acute idiopathic thrombocytopenic purpura in children. *American Journal of Hematology* 1979; **7**: 87–96.
36 Dickerhorff R, von Rueker A. The clinical course of immune thrombocytopenic purpura in children who did not receive intravenous immunoglobulins or sustained prednisone treatment. *Seminars of Thrombosis and Hemostasis* 2000; **137**: 629–632.
37 Bolton-Maggs PH, Dickerhoff R, Vora AJ. The nontreatment of childhood ITP (or 'the art of medicine consists in amusing the patient until nature cures the disease'). *Seminars of Thrombosis and Hemostasis* 2001; **27**: 269–275.
38 Ada Council on Access, Prevention and Interprofessional Relations. Caries diagnosis and risk assessment: a review of preventive strategies and management. *Journal of the American Dental Association* 1995; **126** (Suppl.): 1S–24S.
39 Ismail AI. Prevention of early childhood caries. *Community Dentistry and Oral Epidemiology* 1998; **26** (Suppl. 1): 49–61.
40 British Nutrition Foundation Dental Caries. Diet and nutrition. In: *Oral Health Diet and Other Factors*. Amsterdam: Elsevier, 1999: 48–59.
41 Villa A. Caries dental, el uso de fluoruros y su metabolismo: un revisión y puesta al día. *Revista Venezolana de Investigación Odontológica* 2000; **1** (1): 38–38.
42 Rojas-Sanchez F, Arasme MA, Pedauga DF, González H, Acevedo AM. Niveles y tasa de excresión de fluoruro en orina en niños entre 3 y 5 años en San Juan de los Morros, Venezuela. *Review of Revista Venezolana de Investigación Odontológica* 2000; **1** (1): 11–15.
43 González H, Jiménez W, Pineda M, Acevedo AM, Rojas-Sánchez F. Niveles de excresión de fluoruro en orina en niños entre 3 y 5 años de edad en Las Mercedes del Llano, Edo. Guárico, Venezuela. *Revista Venezolana de Investigación Odontológica* 2000; **1** (1): 86.
44 Wagner WR, Pachence JM, Ristic J, Johnson PC. Comparative *in vitro* analysis of topical hemostatic agents. *Journal of Surgical Research* 1996; **66**: 100–108.
45 Henderson JM, Bergman S, Salama A, Koterwas G. Management of the oral and maxillofacial surgery patient with thompocytopenia. *Journal of Oral and Maxillofacial Surgery* 2001; **59** (4): 421–427.
46 George JH, Woolf SH, Raskob GE, Wasser JS, Aledort LM, Ballem PJ, Blanchette VS, Bussel JB, Cines DB, Kelton JG, Lichtin AE, Memillan R, Okerbloom JA, Regan DH. Idiopathic thrombocytopenic purpura. A practice guideline developed by explicit methods for the American Society of Hematology. *Blood* 1996; **88** (1): 3–40.
47 Tomita E, Akatsuka JI, Kokubun Y. Differential diagnosis of various thrombocytopenias in childhood by analysis of platelet volume. *Pediatric Research* 1980; **14**: 133–137.

Copyright of International Journal of Paediatric Dentistry is the property of Blackwell Publishing Limited and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.