



SMART DENTAL UPDATES

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Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you "SMART DENTAL UPDATES" which contain latest and interesting news in the field of Dentistry.

This issue contains:

- **Effect of Alkaline Toothpastes' on Gingivitis, Sensitization, and Plaque**
- **Surgery for Patients with Middle Zone Toxic Phosphorus Osteonecrosis of the Facial Skull.**
- **Intraoral camera in teledentistry to facilitate dental diseases screening**
- **A case report of an erupted compound odontoma with epileptic convulsions.**

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Looking forward to your valuable feedback



1. Effect of Alkaline Toothpastes' on Gingivitis, Sensitization, and Plaque

Introduction:

More than 90% of people worldwide are affected by gingivitis, which is described as "an inflammatory lesion resulting from interactions between the dental plaque biofilm and the host's immune-inflammatory response, which remains contained within the gingiva and does not extend to the periodontal attachment" ⁽¹⁾. To evaluate various toothbrushes in terms of bristle stiffness regarding plaque removal, prevention of gingivitis, and gingival abrasion, numerous clinical trials have been established over the years. Toothbrushes have evolved with time in terms of design and cleaning capabilities. Dental education and health promotion programmes have placed a high priority on promoting effective plaque management via frequent teeth brushing ⁽²⁾. Clinical dental conditions like dentine hypersensitivity (DH) are rather frequent. It is distinguished by characteristic short, intense pain that develops from exposed dentine in reaction to outside stimuli, which are often thermal, evaporative, tactile, osmotic, or chemical in nature. Patients who have periodontal surgery will see a marked rise in the occurrence of DH ⁽³⁾. The purpose of this study was to assess the effects of two toothpaste formulations on gingivitis, dentin hypersensitivity, and oral hygiene in young adults: one with fluoride and the other without fluorinated derivatives ⁽¹⁾.

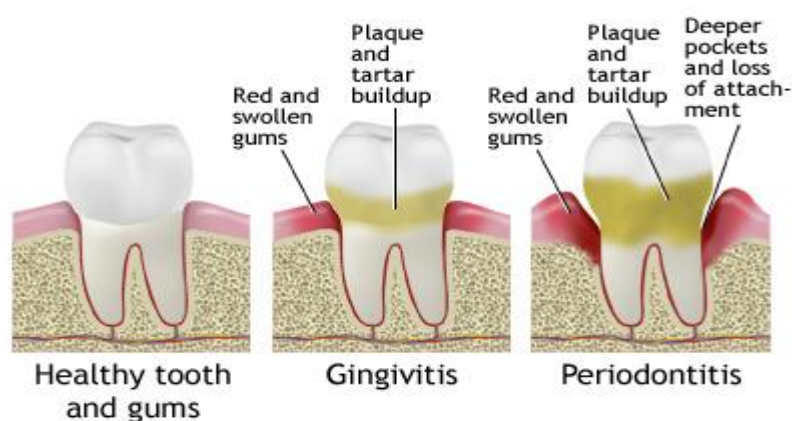


Fig 1 shows a healthy tooth , gingivitis and periodontitis tooth

Methods:

In this double-blind, parallel-group trial, 84 consenting individuals with reported gingivitis and dentin hypersensitivity (DH) were enrolled. They were then divided into two groups (each n = 42). Changes in Modified Gingival Index(MGI), Bleeding Index(BI), and DH scores on



the Schiff Scale(SS) and Visual Analogue Scale(VAS) scales were the primary outcome measures. Changes in salivary pH and RMNPI were considered secondary outcome measures. The results were evaluated four weeks following the intervention.

Results:

MGI and BI were used to evaluate the gingival condition. The modified gingival index showed a substantial increase in gingival health, with effect sizes of 0.99 [CI95%: 0.52-1.46] and 1.71 [CI95%: 1.18-2.24] (table1). the gingival bleeding index, with effect sizes in the TW and TWF groups of 3.17 (CI95%: 2.39-3.94) and 2.64 (CI95%: 1.96-3.32), respectively. Both groups saw a decline in DH, but the TWF group experienced a substantially larger decline (effect sizes of 3.28 [CI95%: 2.51-4.04] and 3.10 [CI95%: 2.40-3.80] on the visual analogue scale and Schiff scale, respectively). There were no adverse effects reported.

Discussion:

The study evaluated how fluoride-containing and

fluoride-free alkaline toothpastes affected oral health markers. Both groups' gingival health and dental hygiene showed a considerable improvement, and both groups' dentin hypersensitivity reduced, however the TWF group saw a much larger decline. After using both toothpastes, the pH of the saliva became more alkaline. The relative dental abrasivity (RDA) value of a toothpaste and environmental variables, such as pH, were used to determine the efficacy of cleaning⁽¹⁾.

The toothpastes used in this study had low RDA values, so it's possible that other factors, including the toothpaste's alkalinity, contributed to the considerable increase in oral hygiene in both groups. In previous studies conducted by Hamza, B et al and, Kim, J.H., et al. founds high abrasivity may cause dentin wear and DH. Patients with DH are advised to use toothpastes

Group	Baseline	4 Weeks	Effect Size (Cohen's d)
TW (n = 41)			
Mean (SD)	0.053 (0.029) ^a	0.030 (0.016) ^A	0.99
CI95%	0.044–0.062	0.025–0.035	0.52–1.46
Median (Q1, Q3)	2.86 (1.93; 3.43)	0.63 (0.43; 0.78)	
p values	<i>p</i> < 0.001 ¹		
TWF (n = 41)			
Mean (SD)	0.053 (0.024) ^a	0.017 (0.013) ^B	1.71
CI95%	0.043–0.058	0.013–0.021	1.18–2.24
Median (Q1, Q3)	2.46 (1.96; 3.21)	0.54 (0.43; 0.86)	
p values	<i>p</i> < 0.001 ¹		

Table 1: a, A, B Different letters indicate statistically significant differences between the groups; 1 Wilcoxon signed-rank test; MGI—Modified Gingival Index; TW—toothpaste containing thermal water; TWF —toothpaste containing thermal water with fluoride.



with low RDA. Most frequently, low-abrasive toothpastes are identified by an RDA of less than 70^(4,5).

Conclusion:

After 4 weeks of regular usage, the toothpaste with alkaline thermal water significantly reduced gingival inflammation and bleeding, dental plaque accumulation, and dentin hypersensitivity in young people. The fluoride-containing toothpaste (1450 ppm) had a considerably larger effect on DH than the fluoride-free toothpaste.

The fluoride-containing toothpaste (1450 ppm) significantly reduced dentin hypersensitivity more than the fluoride-free toothpaste.

Reference:

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2. Surgery for Patients with Middle Zone Toxic Phosphorus Osteonecrosis of the Facial Skull.

Introduction:

In recent years, the issue of treating people with toxic phosphorus osteonecrosis of the facial region of the skull has evolved from a purely medical to a social one ⁽¹⁾. It is well known that changes in phosphate metabolism have a significant impact on the hard and soft tissues of the mouth cavity. Phosphorus necrosis of the jaw preceded the current clinical form of osteonecrosis of the jaw (ONJ). More medicinal treatments have been created in the recent 20 years to treat both osteoporosis and cancers associated with skeletal-related events by reducing bone turnover via antiresorptive activities, i.e., targeting osteoclasts with bisphosphonates (BPs) and RANK ligand (RANKL) inhibitors ⁽²⁾. Toxic phosphorus osteonecrosis caused by narcotic medication injections of pervitin and desomorphine. Because of their limited compliance and the existence of associated infectious illness, diagnostics and surgical therapy for this group of patients are challenging. The purpose of this study was to improve the efficacy of surgical therapy for individuals with toxic phosphorus osteonecrosis of the bones of the facial region of the skull ⁽¹⁾.

Methods:

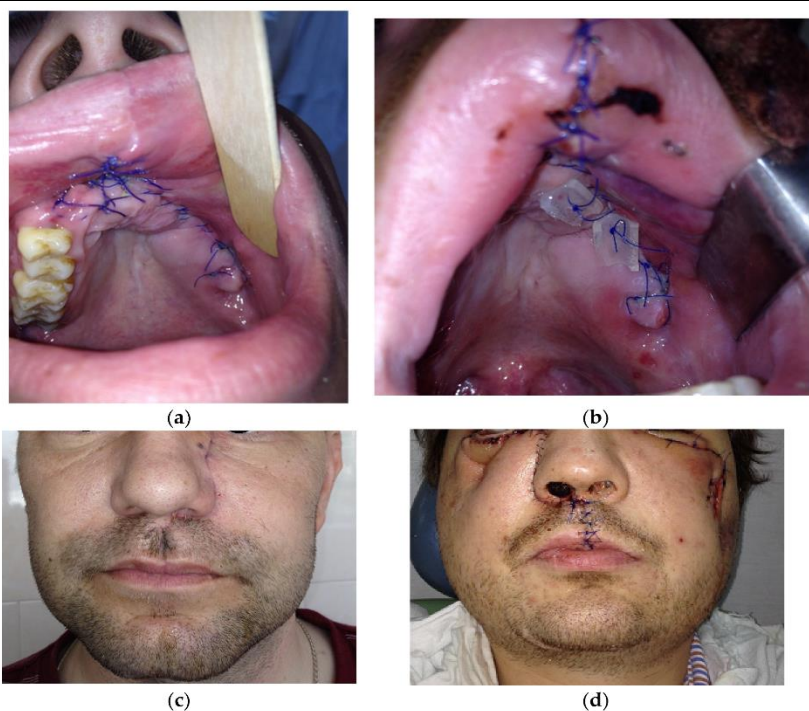
The study included the assessment and treatment of 50 individuals with toxic phosphorus craniofacial osteonecrosis. The patients' ages varied from 22 to 44 years. The primary diagnostic criteria were clinical examination findings, medical history, and patient complaints: Exposure to maxilla or craniofacial bone for at least 2 months following the triggering cause, e.g., tooth removal; the appearance of intra- and extraoral fistulas with suppuration; and foci of infiltration with no major fluctuation. Based on the type of pathological condition in the midface area, all patients were categorised into four groups: Type 1: individuals suffering from a local pathological process in the maxilla. Type 2: individuals with maxillary involvement. Type 3 individuals have maxilla and zygomatic bone involvement. Type 4 individuals have maxilla, zygomatic bone, and orbital floor involvement. Microbiological tests were also done before and after hospitalisation. The follow-up was scheduled every six months.



Results:

Intraoral purulent discharge with odour (10 patients—66.7%) and intraoral bone exposure (15 subjects—100%) were seen in type 1 patients. Pus in the oral cavity occurred in type 2 patients (13 patients—92.8%), as were exposed bone regions in the maxilla, a painful condition, and tooth position derangement (10 subjects—71%). The most common complaint among type 3 patients was maxilla bone exposure (11 patients—100%), followed by purulent leakage in the oral cavity (11 patients—100%), midface soft tissue edoema, facial deformation, painful condition, and malocclusion (8 subjects—73%).; Almost all of the stated problems were present in type 4 individuals (10 patients—100%). The radiological examination, which included multi-scan computed tomography data, revealed abnormalities in the bone of the

maxilla, zygomatic bone, and orbit involvement in severe type 4 osteonecrosis, with varied cortical bone destruction comparable to chronic osteomyelitis.



Postoperative view of patients in the early period (before 14 days): (a) with type 1; (b) with type 2; (c) with type 3; (d) with type 4.

Discussion:

The issues of treating patients with significant diseased processes of the craniofacial area requires surgical intervention and have persisted throughout the history of medicine. In a study by Sergent, J.-F et al and Hakobyan, K. et al had proven the high efficiency of maxillary resection in the case of diagnosed osteonecrosis of the skull bones of various etiologies, which have served as the basis for the development of various surgical techniques for the treatment of patients with toxic phosphorus osteonecrosis of the jaw^(3,4).

This study selected a radical resection to completely remove the pathological foci as a surgical method of treatment for patients with toxic phosphorus osteonecrosis of the upper jaw, which



was in agreement with the findings of a study by Medvedev, Y.A. et al. who believed that intraoral resection of the maxilla and other bones in the volume of necrectomy and sequestrectomy was the most effective surgical procedure for treating pain syndrome ⁽⁵⁾.

Conclusion:

The results of the study demonstrated the value of surgical intervention in patients with toxic phosphorous osteonecrosis of the middle zone of the facial skull, which was particularly helpful in treating a pathological process that only affected a small portion of the jaw. In more than 50% of instances, it enabled complete eradication of the primary complaint—the pain. The surgical procedure was effective as a palliative approach for severe facial bone damage.

In patients with toxic phosphorous osteonecrosis of the middle zone of the facial skull, surgical treatment is crucial because it is particularly successful in treating the pathological process that spread on a limited area of the jaw.

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3. Intraoral camera in teledentistry to facilitate dental diseases screening

Introduction:

Information and communication technologies are used in teledentistry to support the provision of oral healthcare, consultation, referral, and patient-health professional communication and knowledge exchange ⁽¹⁾. Teledentistry offers the potential to expand access to treatment, especially in places with limited resources. It makes it feasible to provide coordinated treatment as near to the patient's home as possible, improving efficiency and organisation. For more than 6 years, teledentistry has been employed, especially in the planning of care for elderly patients and those with disabilities. As a result of new technology and the digital age, this profession has recently seen significant change. In instance, intra-oral cameras are one of the new examination instruments that are being developed to help specialists ⁽²⁾. Teledentistry decreases disparities in oral health care by facilitating access to care in rural places, long-term care homes, and prisons as well as under challenging conditions like the COVID-19 epidemic. The purpose of this study was to evaluate the diagnostic efficacy of teledentistry examination in contrast to direct oral examination by a dentist in order to facilitate dental disease screening programmes in prisons ⁽¹⁾.

Methods:

There were three stages to this crossover research. In Phase I, teledentistry training for the use of an intraoral camera (IOC) was offered to prisoner health volunteers (PHVs). In Phase II, the PHV examined prisoners who had reported dental issues for dental disorders using IOC and photographed symptomatic regions. The dentist and PHV separately decided that a combination of dental fillings, scaling, extractions, and surgical removal of an impacted tooth were necessary. In phase III, another dentist conducted a direct oral examination of the prisoners who had reported issues in phase II in order to assess dental treatment needs. Direct oral examination by a dentist was used as a true positive to assess sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV).

Results:



Phase III research participants included 152 male prisoners with 215 problematic teeth. The average age of the participants was 33.6 (± 9.1) years old (range 19-67 years old). The diagnostic accuracy of 152 prisoners with 215 teeth was determined.

The sensitivity, specificity, PPV and NPV of the teledentistry and direct oral examinations are illustrated in Table 1. The sensitivity and specificity of the two dentists' teledentistry exams were greater than 90%, and the PPV and NPV varied from 81.8% to 100%. Furthermore, the PHV's teledentistry evaluations ranged in sensitivity and specificity from 33.3 to 99.0%, with the lowest proportion reported for dental scaling and surgical tooth removal. The PPV for

Diagnostic accuracy testing between the teledentistry and direct oral examinations.				
Teledentistry examination	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
PHV: Dental filling	97.1	81.1	50.0	99.3
Dental scaling	33.3	98.5	40.0	98.1
Simple extraction	75.8	86.0	94.7	51.8
Surgical removal of impacted tooth	33.3	99.0	60.0	97.1
Dentist: Dental filling	97.1	97.2	89.5	99.4
Dental scaling	100.0	100.0	100.0	100.0
Simple extraction	93.9	98.0	99.4	83.1
Surgical removal of impacted tooth	100.0	98.6	81.8	100.0

dental fillings, dental scaling, and surgical tooth removal varied from 40-60%, whereas simple tooth extractions had the lowest NPV.

Discussion:

This study results showed that teledentistry and direct oral examination had good sensitivity, specificity, PPV, and NPV in assessing dental treatment requirements between two dentists. Previous research by Shaya M et al and Vetchaporn S et al indicated that the IOC, when compared to a direct oral examination, is a useful and reliable technique for screening oral illnesses such as dental caries and oral cancer. Similarly study results shows that, when compared to a direct oral examination, the IOC employed in the current teledentistry displayed satisfactory diagnostic accuracy in assessing the convicts' dental treatment needs^(3,4).

Conclusion:

Teledentistry enables dentists to perform dental disease screening programmes for prisoners. When compared to direct oral examination, the dentists obtained adequate diagnostic accuracy



when using the IOC to detect potential dental treatment requirements. However, because of difficulties in obtaining an exact diagnostic of pulp and periodontal condition, teledentistry imaging is insufficient to precisely detect all dental treatment needs.

Dentists achieved beneficial diagnostic accuracy when compared to direct oral examination using the intraoral camera to detect potential dental treatment needs

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4. A case report of an erupted compound odontoma with epileptic convulsions.

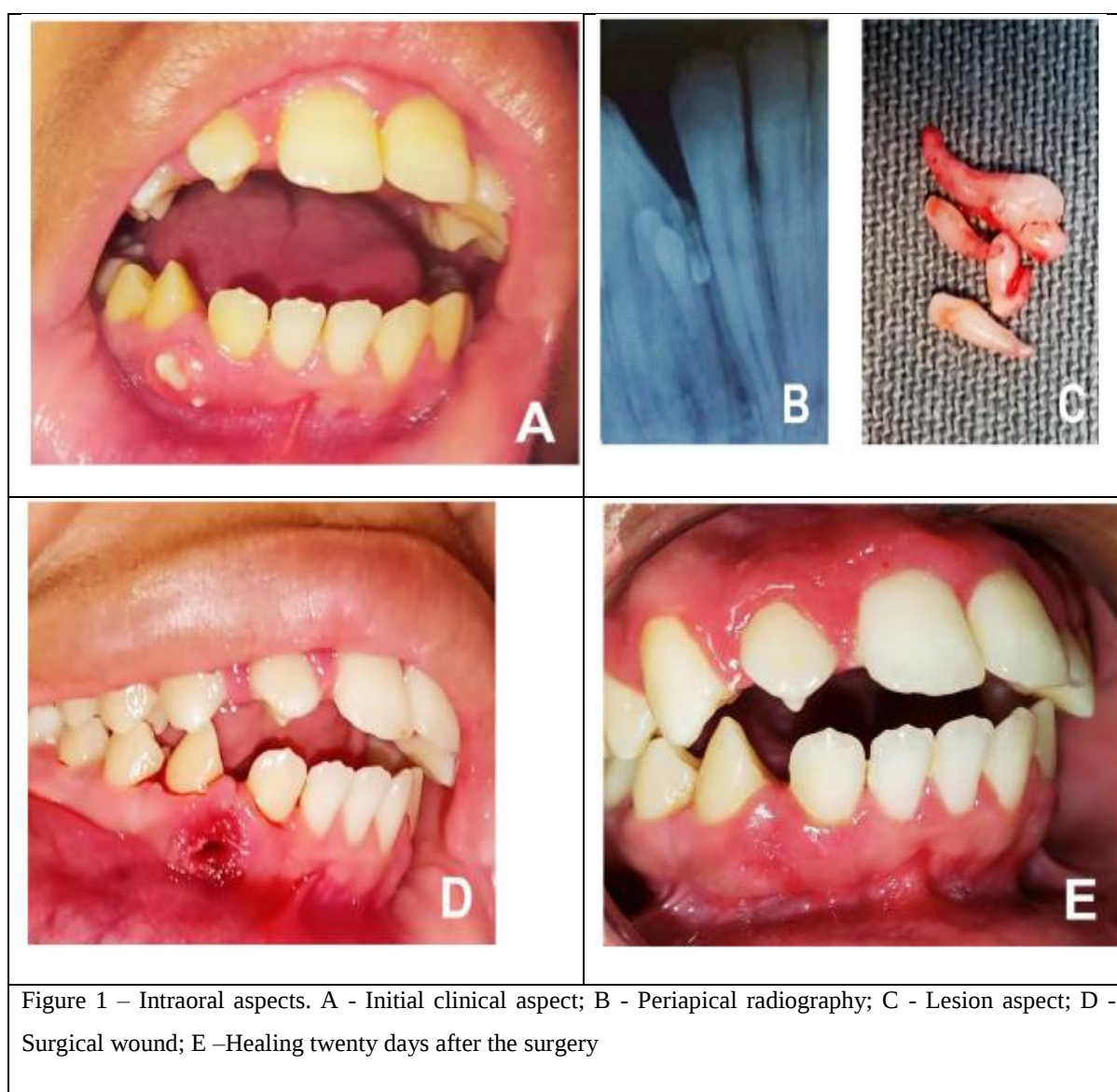
Introduction:

Odontomas are the most prevalent benign tumours of odontogenic origin that are classified as hamartomas. They are made up of enamel, dentin, cementum, and pulp. According to the World Health Organization's classification, there are two forms of odontomas: complicated and compound odontomas. Patients with odontomas are always asymptomatic, however they are frequently associated with tooth eruption problems ⁽¹⁾. The occurrence of complex odontomas in the oral cavity is rare. One of the most severe types of genetic epilepsy is severe myoclonic epilepsy in infancy, often known as Dravet syndrome. often, is distinguished by a wide spectrum of seizures, the majority of which are resistant to medication, and often affects persons with significant cognitive impairment. Psychogenic nonepileptic seizure (PNES) is a complicated illness that can appear with physical or neurological symptoms comparable to epilepsy but without the neurological abnormalities that cause the seizures. This is a case of erupted compound odontoma in the mandible of a 17-year-old girl in investigation of Dravet syndrome and psychogenic nonepileptic seizures. The clinical, radiological, and microscopic evaluation, as well as morphology assessment, clinical findings and treatment were described ⁽²⁾.

Case Report:

A 17-year-old girl was examined at the dentistry clinic for Dravet syndrome, psychogenic nonepileptic seizures, minor intellectual disability, and psychotic illness. She has experienced seizures since she was 11 months old and has been on antiepileptic medications since then. After more than 4 years without epileptic episodes, she developed PNES at the age of 16. She experienced no pain in her mouth. She was taking haloperidol 5 mg, lamotrigine 100 mg, nitrazepam 5 mg, and quetiapine 100 mg at the time. An enamel-like tissue about 2 mm exposed in gingiva between the right permanent mandibular lateral incisor and canine teeth, an anatomical alteration in the superior lateral right tooth, and an anterior open bite was identified during an intraoral examination. (Figure 1A). A radiopaque picture of irregular tooth-like structures shown by periapical radiography of the mandibular area suggested the

existence of an erupted complex odontoma. (Figure 1B). First, the mandibular buccal gingival area between the right canine and premolar was occluded with infiltrative anaesthesia (one tube of Citanest 3%). The lesion was accessible without using a flap, and a tooth-like tissue was excised. The surgical incision was curetted and cleansed with 0.9% saline solution before a simple stitch was placed. (Figures 1C and 1D). The diagnosis of compound odontoma was confirmed by the pathology report. There were no difficulties, seizures, or the requirement for sedation during the treatment. The patient was very cooperative throughout. There was acceptable recovery twenty days following the surgery, and the patient adhered to her dental and medical therapies. (Figure 1E).



Discussion:



During the course of the condition, patients with normal Dravet syndrome suffer a variety of seizures, including generalised tonic-clonic seizures, generalised clonic seizures, and unilateral alternating clonic seizures⁽²⁾.

Odontomas are the most common odontogenic tumours, with the majority of cases occurring in the second and third decades of life. There is no evidence of anatomical place preference in the oral cavity. According to Levi-Duque et al., odontomas are most commonly seen in the anterior zone of the superior maxilla (50%), followed by the anterior region of the mandible (15%), and are less than 10 mm in size⁽³⁾.

Previous studies conclude that "In patients with seizures, it is important to be aware of the occurrence of dental trauma, which is increased in epileptic patients"^(4,5).

Conclusion:

This case study of a child with a history of epileptic episodes who developed compound odontoma emphasises the need of early detection and treatment. Because the aetiology of odontoma is not well understood, it is uncertain if epileptic convulsions that may occur during the time of dental formation and increase patient risk of unintentional tooth injuries might support the development of these lesions.

Patients with typical Dravet syndrome experience a range of seizures, including common tonic-clonic seizures, generalised clonic seizures, and unilateral alternating clonic seizures.

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