

Five parapremolars in a non-syndromic patient: A case report

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Abstract

Supernumerary teeth or hyperdontia are additional or an excessive number of teeth present in normal deciduous or permanent dentition. The prevalence of supernumerary teeth is between 0.1 and 3.8% in permanent dentition and between 0.3 and 0.8% in deciduous dentition. In Sabah, the prevalence of supernumerary teeth is 10.32% among orthodontic patients. The condition is more common in male patients. A case report involved a fit and healthy 19-year-old male student who presented with multiple supernumeraries. Upon clinical examination, there were three erupted supernumeraries on the bilateral mandibular premolar region, and additional two impacted supernumeraries being discovered after further radiographic investigation. This anomaly was found during an annual dental school checkup program. The patient had congenital absence of the lower left third molar. Primary dental care was carried out such as filling for carious teeth, scaling, oral hygiene reinforcement and regular monitoring. The patient declined any other dental treatment options such as extraction of the non-functioning supernumerary parapremolar teeth, or orthodontic treatment to improve his malocclusion. Currently, the patient is under oral hygiene maintenance with regular dental follow-ups. In a nutshell, the importance of regular dental follow-ups and review is crucial to monitor any signs and symptoms of pathology such as cystic formation of unerupted supernumeraries. Reinforcement of oral hygiene and caries risk assessment should be carried out during reviews to improve and maintain the patient's quality of life.

Keywords: adolescent, malocclusion, premolars, supernumerary teeth, Sabah

Introduction

Supernumerary teeth, or hyperdontia, are additional or an excessive number of teeth present in normal deciduous or permanent dentition (Parolia *et al.*, 2011). Supernumerary teeth commonly present as a single tooth at 80%, two teeth at 15 to 20%, three teeth at 3 to 4%, and 1% for four teeth and above (Lubinsky & Kantaputra, 2016). The prevalence of supernumerary teeth is between 0.1 and 3.8% in permanent dentition and between 0.3 and 0.8% in deciduous dentition (Bahoudela *et al.*, 2022;

Hussein & Majid, 1995; Rajab & Hamdan, 2002; Roslan *et al.*, 2018). In Sabah, the prevalence of supernumerary teeth ranges from 3.1% to 10.3% among orthodontic patients (Lee, 2020; Loke, 1998). The prevalence of parapremolars among non-syndromic patients ranges from 0.24 to 9.1% (Khalaf *et al.*, 2018). The condition is commonly found in male patients, and in patients with a cleft lip and palate, Gardner syndrome, and cleidocranial dysostosis. The etiology for supernumerary teeth remains unclear (Parolia *et al.*, 2011; Rajab & Hamdan, 2002). However, several authors have suggested it is hereditary, and involves

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hyperactivity of the dental lamina (Bahoudela *et al.*, 2022; Parolia *et al.*, 2011; Rajab & Hamdan, 2002). Supernumerary teeth are often discovered during routine dental examinations or as an accidental radiographic finding. Patients with erupted supernumerary teeth often come to a dental clinic for treatment of caries on an adjacent tooth or malocclusion caused by it.

Parolia *et al.*, (2011), categorized supernumerary teeth according to morphology, eruption, location, and chronology. In terms of morphology, supernumerary teeth can be described as conical, tuberculate, supplemental, and odontoma. Eruption type wise depends on the pattern such as fully or partially erupted and impacted. Supernumerary teeth are classified according to their position, for example mesiodens (premaxilla), paramolar (molar region), distomolar (distal to third molar) and parapremolar (premolar region). The chronology divides into two periods which are during deciduous or permanent dentition (Parolia *et al.*, 2011).

The presence of supernumerary teeth brings few clinical complications to the dentition of the patient, including malocclusion, dental caries, and difficulty to maintain good oral hygiene. Supernumerary teeth such as mesiodens commonly cause delayed eruption of successor teeth, as well as crowding, median diastema, rotation, and root resorption of adjacent teeth (Meighani & Pakdaman, 2010). Hence, this case report describes the complications that occurred with the presence of five parapremolars in the maxilla and mandible in a non-syndromic patient with non-surgical management and its review protocol.

Case Report

A 19-year-old sixth-form student came for an incremental dental care (IDC) checkup, which is routinely carried out at Kolej Tingkatan 6 Tawau annually. The patient was fit and healthy with no active chief complaint. Upon intra-oral examination (Figure 1), there were supernumerary teeth at the premolar region bilaterally on the

mandibular arch. Two supernumerary teeth were in the right premolar region while one was seen clinically on the left premolar region. In addition, the patient presented with poor oral hygiene, dental caries on the occlusal and interproximal lower molars, severe crowding, a buccally displaced upper right canine, a deep overbite and a posterior crossbite due to the presence of the supernumerary teeth.

The patient was sent for dental panoramic tomogram (DPT) imaging at a private clinic to rule out unerupted supernumerary teeth at other regions on both arches (Figure 2). The DPT showed impacted supernumerary teeth at the lower left premolar region and upper left premolar region, and congenital absence of the lower left third molar.

The patient returned to Klinik Pergigian Tawau for periapical radiograph (PA) investigation where three separate PAs were taken, with one horizontal parallax technique on the upper left quadrant (Figures 3–6). The purpose of the PAs was to assess the location of the supernumerary teeth, and their effects on adjacent teeth, such as external root resorption and eruption cyst. Figure 3 shows there was both one erupted and one unerupted, supplemental-type, supernumerary tooth on the lower left quadrant, while on the lower right quadrant, both supplemental-type supernumerary teeth were fully erupted (Figure 4). One conical-shaped supernumerary tooth was seen located between the upper left first and second premolar (Figure 5). A parallax technique with mesial horizontal shift was used to assist in determination of the position of the supernumerary tooth in the upper left premolar region. For this case, the supernumerary tooth shifted mesially when periapical radiograph with mesial horizontal shift was taken (Figure 5 & 6). Hence, the unerupted supernumerary tooth was located at the palatal region of the upper left premolars (Figure 6). The absence of external root resorption was observed in all PA radiographs. Upper and lower dental impressions were taken for the purpose of study models for his dental anomalies (Figure 7).



Figure 1. Patient's intraoral condition at first visit.



Figure 2. Dental Panoramic Tomogram (DPT) view of patient to rule out other supernumerary teeth and clinically undetected pathology at other regions of the jaw.



Figure 3. Periapical radiograph (PA) view of supernumerary teeth at third quadrant. Two erupted premolars with one unerupted and one erupted parapremolar.



Figure 4. PA view of supernumerary teeth at fourth quadrant. Two erupted premolars and two erupted parapremolars overlapping each other. Mesial caries noted on lower right first molar.



Figure 5. One conical-shaped supernumerary tooth located between upper left first and second premolar.



Figure 6. The single supernumerary tooth moved towards mesial when the angle of radiograph shifted mesially.

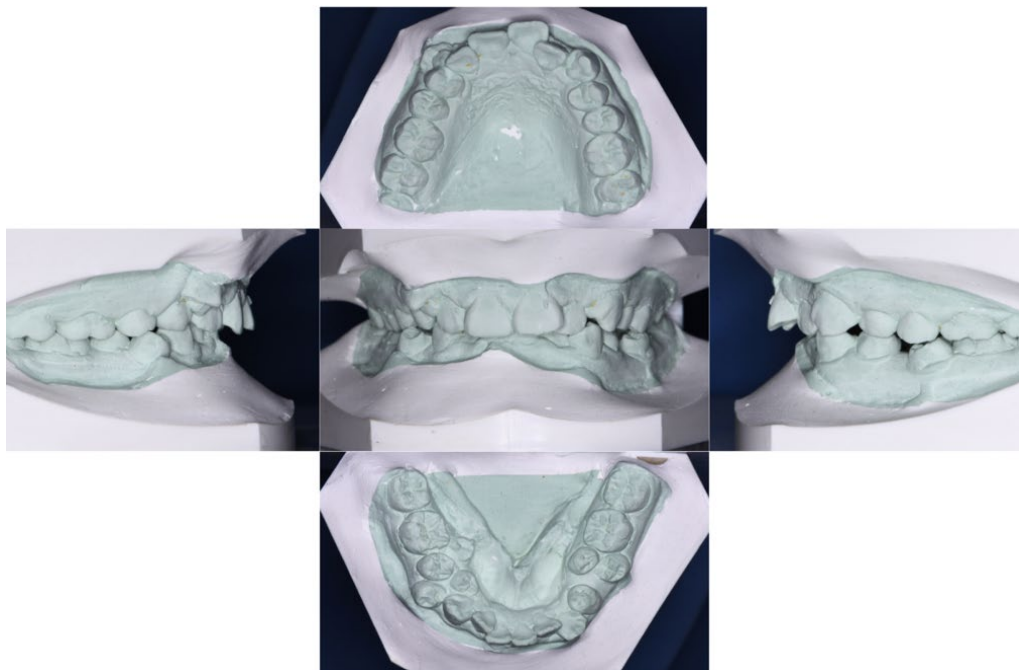


Figure 7. Malocclusion seen on the dental cast of the patient.

Further intraoral examinations were carried out including periodontal charting, plaque index and caries risk assessment. The Basic Periodontal Examination (BPE) score for the patient was 2 for all sextants with an average pocket depth of 2–3mm at the supernumerary teeth region. The patient's plaque index and calculus index were 52.98% and 29.76% respectively with a high caries risk (Figure 8).

The diagnoses for this patient were dental caries on lower molars, moderate generalized gingivitis, Class II division 2 malocclusion with Class II molar relationship bilaterally, deep overbite, severe crowding, buccally displaced upper right canine, crossbite due to the presence of supernumerary teeth, impacted supernumerary teeth. His Index of Orthodontic Treatment Needs (IOTN) score was 4d, which was severe contact point displacements greater than 4mm.

A treatment plan was formulated and discussed with the patient (Table 1). However, the patient only opted for primary dental care such as fillings for carious teeth, full mouth scaling, oral hygiene reinforcement and regular monitoring. The patient was not interested in any other dental treatment options such as extraction of non-functioning supernumerary pararemolars teeth or orthodontic treatment to eliminate his malocclusion. The risks and consequences were explained to the patient, including risk of an infected eruption cyst and dental caries at the crowding region.

Routine dental treatment was initiated with full mouth ultrasonic scaling, restoration of carious teeth 36, 37, 46, and 47, fissure sealants on 16, 17, 26, and 27 with fluoride vanish application on mild white spot lesion of the anterior teeth. Oral hygiene reinforcement was given to the patient with a two-week recall for an oral hygiene review.

H. PENILAIAN RISIKO KARIES (Tandakan ✓ jika berkaitan)

Langkah 1: Penilaian Pengalaman Karies Semasa

Pemeriksaan	Sound (Kod 0)	Karies Awal (Kod E)	Karies (Kod 1)
Tandakan Kod yang Tertinggi			

Langkah 2: Penilaian Faktor Risiko

- Plak yang Boleh Dilihat (Gred C dan E)
- Kesesakan Gigi
- Terdapat Apliance Pergigian
- Tidak Terdedah Kepada Fluorida
- Ambil Makanan Bergula Antara Waktu Makan
- Kompromi Perubatan / Kesihatan
- Ibu / Adik-beradik Mempunyai Riwayat Karies
- Mulut Kering

Langkah 3: Petunjuk Risiko Karies
Bulatkan : Rendah/Sederhana/Tinggi

Bilangan Faktor Risiko	Sound (Kod 0)	Karies Awal (Kod E)	Karies (Kod 1)
<input type="checkbox"/> 0	Rendah	Sederhana	Sederhana
<input checked="" type="checkbox"/> 1-2	Rendah	Sederhana	Tinggi
<input type="checkbox"/> 3 atau lebih	Sederhana	Tinggi	Tinggi

Langkah 4: Lawatan Susulan

3 Bulan 6 Bulan 12 Bulan

Figure 8. Patient's caries risk assessment from LP8 Card.

Table 1. Treatment plan and options for the patient.

Phase	Treatment
Primary dental care	<ul style="list-style-type: none"> • Ultrasonic scaling • Restoration of teeth 36, 37, 46 and 47 • Fissure sealant application on teeth 16, 17, 26 and 27 • Fluoride varnish application on teeth 12 and 22
Maintenance phase	<ul style="list-style-type: none"> • Re-evaluation of: <ul style="list-style-type: none"> - Plaque score - Dental caries - Calculus index - Pocket depth
Surgical phase (Optional)	<ul style="list-style-type: none"> • Extraction of supernumerary teeth • Surgical removal of impacted supernumerary tooth
Corrective phase (Optional)	<ul style="list-style-type: none"> • Fixed appliance orthodontic treatment

The patient was recalled after two weeks for a review of his oral hygiene at Form 6 College (Figure 9). His plaque index score had reduced to 28.57%. The patient was still motivated to maintain his oral hygiene. However, he still insisted on primary dental care only.

The patient was recalled for a review after six months as part of the maintenance phase

at primary dental clinic (Figure 10). His plaque index score was 25%. Mild calculus was noted on the lower and upper incisors with a calculus score of 3.57%. There was no new caries on his teeth. He was discharged from primary dental care and advised to attend an annual dental checkup, and oral hygiene was reinforced.



Figure 9. Patient's intraoral condition at two-week review after treatment.



Figure 10. Patient's intraoral condition at six-month review.

Discussion

Supernumerary teeth contribute to several clinical complications including dental caries, malocclusion, poor oral hygiene, and cystic formation. Development of caries and accumulation of plaques are the results of patient being unable to clean the crowded site effectively (Kolawole & Folayan, 2019). Patients with severe malocclusion also have increased risk of dental caries (Feldens *et al.*, 2015). In this case, the patient initially presented with poor oral hygiene and multiple dental caries on the lower molars. However, oral hygiene reinforcement was given at the two-week review and the improved result of oral hygiene status at the six-months review showed that the patient was able to maintain his oral hygiene despite only opting for primary dental care treatment. Oral hygiene instructions and patient education played a major role in motivating the patient to maintain good oral hygiene.

The development of pathological cysts such as infected dentigerous cysts are also

observed in patients with impacted supernumerary teeth (Lustmann & Bodner, 1988). The prevalence of dentigerous cysts in impacted normal dentition ranged from 11.4 to 35.5%, while in impacted supernumerary teeth it ranged from 0.7 to 5.5% (Johnson *et al.*, 2014; Noujeim & Nasr, 2021; Stafne *et al.*, 1931). Early identification of supernumerary teeth is essential so that early treatment or interception can be planned and executed. This would minimize and avoid development of more severe malocclusion and cystic formation. Annual dental reviews and intraoral PAs around the supernumerary teeth will aid in monitoring for future potential cystic changes.

Imaging modalities for supernumerary teeth varies according to investigation needs. Cone beam computed tomography (CBCT) can be used to obtain information about unerupted supernumerary teeth such as the location, size and dimension of eruption cysts and the detection of external root resorption of adjacent teeth (He *et al.*, 2023). For detection of erupted supernumerary teeth in the oral cavity, dental panoramic

tomogram (DPT) is sufficient and is widely used (Bahoudela *et al.*, 2022). A periapical radiograph (PA) can be used to determine the location of a single unerupted supernumerary tooth and its root morphology before dental extraction. In this case, PA and DPT were used to determine the location of unerupted supernumerary teeth and to rule out any clinically undetected unerupted supernumerary teeth in other regions of the oral cavity.

Treatment of supernumerary teeth varies according to the intraoral condition affected. It includes regular follow ups, dental extraction, and surgical removal of impacted supernumerary teeth. Removal of supernumerary teeth is recommended when there is associated pathology, malocclusion of adjacent teeth, and delayed permanent tooth eruption, as well as an increased risk of caries risk where crowding is present making it difficult to maintain oral hygiene (Parolia *et al.*, 2011). Care of surrounding anatomical structures during surgical removal is crucial when the surgical area is near to vital structures such as the mental foramen, inferior alveolar nerve, and maxillary sinus spaces. In a situation where the patient does not wish to have supernumerary teeth removed, it is important to reinforce oral hygiene and regular monitoring of unerupted supernumerary teeth (Khalaf *et al.*, 2018; Parolia *et al.*, 2011; Rajab & Hamdan, 2002).

Correction of malocclusion is important for the patient to maintain good oral hygiene, and to improve masticatory function and esthetics. Removable or fixed orthodontic appliances are the treatment for correction of malocclusion once supernumerary teeth are removed (Rajab & Hamdan, 2002; Roslan *et al.*, 2018). These appliances are required to correct any misalignment of teeth or closure of space, and to correct an overjet or overbite.

Conclusion

To conclude, long-term follow-ups are crucial to monitor for any signs and symptoms of cystic formation on impacted

supernumerary teeth when the patient opts for non-extraction. A caries risk assessment and reinforced oral hygiene should be carried out during every review appointment to decrease the chances of dental caries and periodontal disease and to improve the quality of life of the patient.

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