

CASE REPORT

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Intervention for Multiple Supernumerary Premolars in a Teenager:
Case Report

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Intervención para múltiples premolares supernumerarios en un
adolescente: Reporte de Caso

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ABSTRACT: Supernumerary premolars have received special attention due to their development during adolescence, representing a dental anomaly of number that could be attributed to a “third dentition” of human species. The goal of its treatment is to avoid possible interference in occlusal development, as long as the benefits of supernumerary removal outweigh its risks. This is a case report of the orthodontic and surgical management of a patient that has been in clinical and radiographic follow-up along eight years (since childhood through adolescence) with the emergence of non-syndromic multiple supernumerary premolars, showing an apparent familiar pattern.

KEY WORDS: Adolescence; Maxillofacial Surgery; Orthodontics; Premolars; Supernumerary.

RESUMEN: Los premolares supernumerarios han recibido especial atención por su desarrollo en la adolescencia, representando una anomalía dental de número que puede atribuirse a una “tercera dentición” de la especie humana. El objetivo en su tratamiento es evitar las posibles interferencias en el desarrollo oclusal, siempre y cuando los beneficios de la remoción de los supernumerarios sobrepasen los riesgos. En este artículo se reporta el caso de un manejo ortodóntico – quirúrgico de un paciente que ha estado en control a lo largo de ocho años (desde la niñez hasta la adolescencia) con la aparición de múltiples premolares supernumerarios no asociados a síndrome, mostrando un aparente patrón familiar.

PALABRAS CLAVE: Adolescencia; Cirugía Maxilofacial; Ortodoncia; Premolares; Supernumerarios.

INTRODUCTION

Recently, the term “third dentition” has been proposed to describe supernumerary teeth that develop and appear after the completion of the usual configuration of 32 permanent teeth, representing a dental anomaly of number in the human species (1-3). Although this clinical phenomenon is relatively frequent in the global population (with an estimated prevalence between 1.5 and 3.8% in permanent dentition), the exact etiology of this anomaly remains unknown (2,4,5).

Among postpermanent supernumeraries, the premolars have received special attention due to their late development and recurrence rate. The first calcifications of supernumerary premolars have been found in adolescence, between ages 12 and 16, as an incidental radiographic finding related to the beginning of an orthodontic treatment (6-8). The third premolars show an approximate prevalence of 9% with respect of all supernumerary teeth, in addition to be more frequently located in the mandible (1,9).

The goal of the treatment of supernumerary teeth is to avoid possible interference in occlusal development and in the orthodontic mechanics such as space closure, as well as some other pathological complications linked to the third dentition (7). The aim of this paper is to report a case of the orthodontic and surgical management of a patient that has been in clinical and radiographic follow-up along eight years (since childhood through adolescence) with the emergence of non-syndromic multiple supernumerary premolars, showing an apparent familiar pattern.

CASE REPORT

A healthy six year-nine months old Mexican boy attended dental service at the Postgraduate Pediatric Dentistry Clinic of San Luis

Potosí University, San Luis Potosí, Mexico seeking a dental assessment. Medical records and informed consents were obtained and signed by his parents, who referred that the child didn't present any systemic disease or genetic disorder. When his parents were asked if any member of the family had suffered of dental anomalies (such as missing or extra teeth), they answer negatively. The intraoral examination revealed a mixed dentition with active eruption of all permanent first molars and permanent mandibular central incisors. At that time, an operative approach was proposed to seal and restore the caries lesions and to extract the persistent primary incisors. The treatment plan was concluded successfully.

At the age of eight years and seven months, the patient was further assessed with radiographic images, and it was noticed the presence of a mesiodens that prevented the adequate eruption of the permanent maxillary left central incisor (Figure 1A, 1B). The new treatment plan consisted in the surgical extraction of the mesiodens and the persistent primary maxillary left central incisor with the help of Maxillofacial Surgery. Five months after the surgical event, there wasn't achieved the clinical eruption of the permanent maxillary left central incisor, so it was decided to perform an orthodontic traction using a Nance appliance modified with a vestibular hook. Also, there was placed a lingual arch as a space maintainer (Figure 1C, 1D).

When the boy was ten years and five months old, a 2x4 appliance was implemented in the maxillary dental arch, along with extraction of the maxillary first premolars. Ten months later, the mandibular dental arch also received extraction of the first premolars and fixation of 2x4 appliance. The orthopantomography of that time revealed some diffuse radiopacities in the mandibular premolar zones of both sides, which haven't been identifiable previously (Figure 1E, 1F).

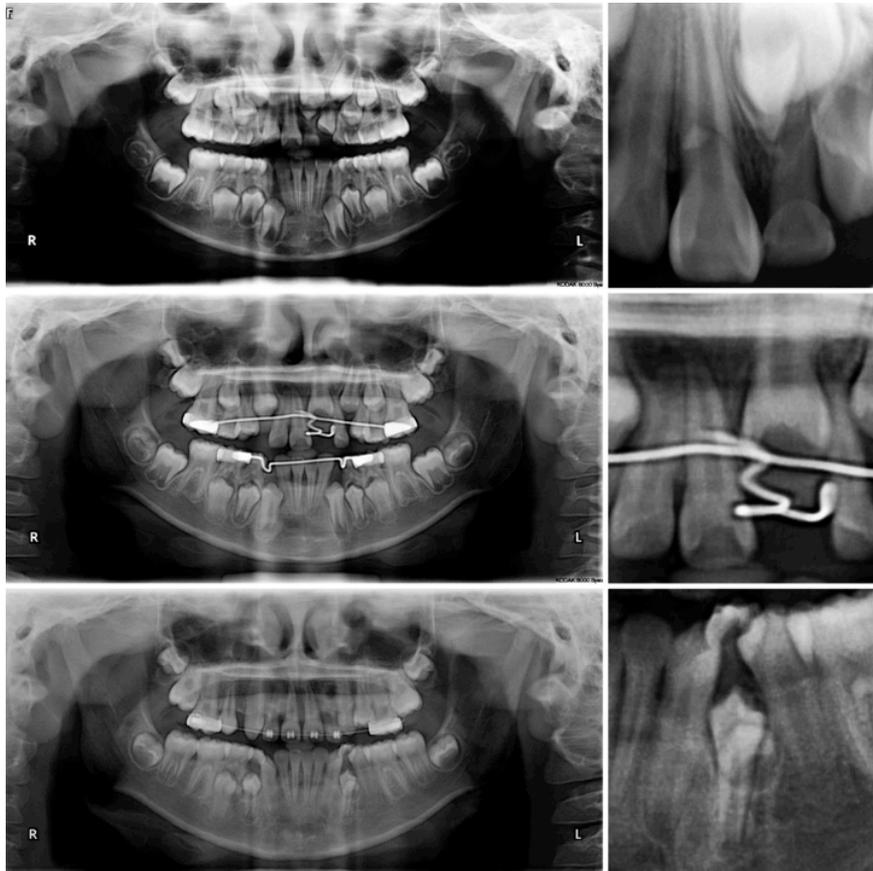


Figure 1. (A, B) 8 years and 7 months, presence of mesiodens in premaxilla. (C, D) 9 years, traction of the permanent left central incisor. (E, F) 10 years and 5 months, 2 x 4 appliance and initial calcifications of mandibular supernumerary premolars.

When the patient was entering adolescence (12 years and 10 months old), brackets were bonded in all permanent teeth, and new radiographic studies were requested. The orthopantomography made evident the development of multiple

dental germs in the mandible, and a Computed Tomography confirmed the initial formation of two supernumerary mandibular premolars in the right side and another three dental follicles at the left side (Figures 2 and 3).

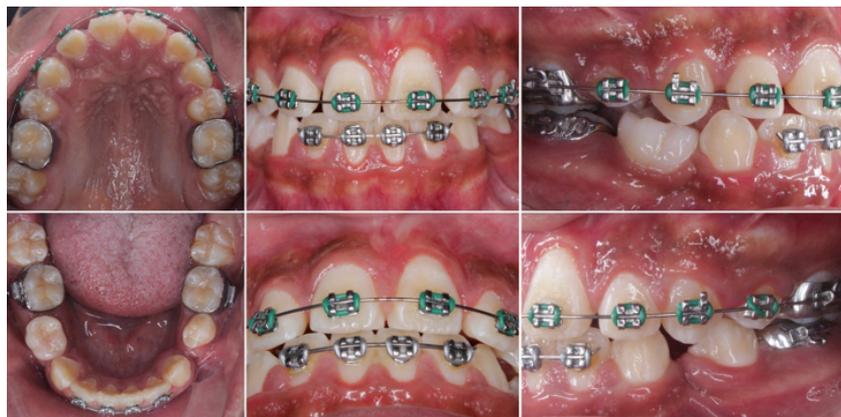


Figure 2. (A-F) Orthodontic treatment at age 12 years and 10 months.

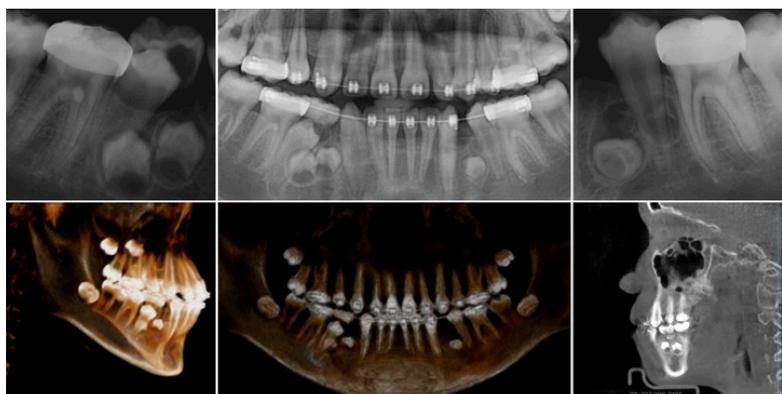


Figure 3. (A-F) Radiographs and CT showing five supernumerary premolars in mandible.

Two surgical events were planned and executed in partnership with Maxillofacial Surgery to perform the extraction of the five supernumerary premolars. In both sessions it was necessary the infiltration of three cartridges of 4% articaine with 1:100,000 epinephrine, along with osteotomy with lingual access to discover the included germs, hemostatic sponge use, silk sutures and the prescription of amoxicillin and ibuprofen. Neither event presented intra or postoperative complications (Figure 4).

Four months after the last surgery, new photographic and radiographic records revealed a progressive bone healing of the premolar zone bilaterally (Figure 5). The most recent follow-up was achieved at age 14 years and 8 months, when the patient was already finishing his orthodontic

treatment with an adequate space closure observed in the panoramic radiograph (Figure 6A). Currently, the patient is in a radiographic follow-up every six months in order to rule out any appearance of new supernumerary teeth.

An interesting finding was the existence of two completely formed and included supernumerary premolars in the orthopantomography of the patients' mother. She attended Orthodontic service seeking for an assessment, and it was just incidentally that we discovered the familiar pattern of the supernumeraries (Figure 6B). She referred that she didn't know about the dental anomaly and the supernumeraries have been kept asymptomatic. She rejected any surgical intervention, which were considered necessary to begin her Orthodontic treatment.

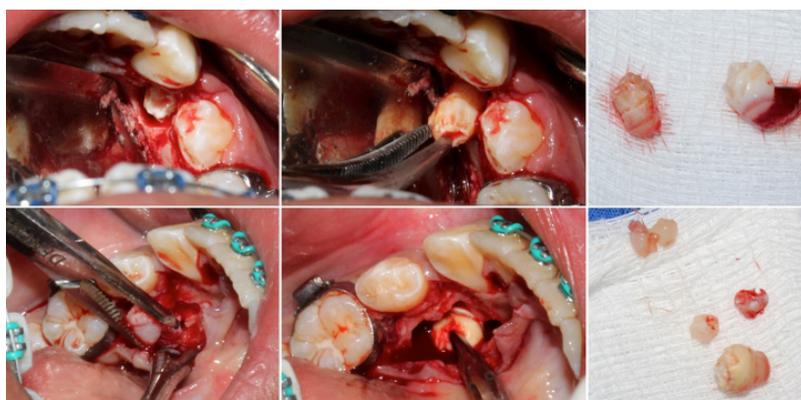


Figure 4. (A-F) Surgical extraction of five mandibular supernumerary premolars.



Figure 5. (A-D) Photographic and radiographic records revealing a progressive bone healing of the premolar zone bilaterally.



Figure 6. (A) Teenager most recent orthopantomography (at age 14 years and 8 months) (B) Panoramic radiograph of the patients' mother showing two completely formed and included supernumerary premolars.

DISCUSSION

Multiple supernumerary teeth have the lowest prevalence of appearance with a percentage less than 1%, if compared to unique or double supernumeraries. Generally, the multiple ones are associated to systemic diseases or syndromes, such as cleidocranial dysplasia or Gardner

syndrome, thus, multiple supernumeraries are more infrequent in healthy patients (10-11). This case report presents a teenager without any disease or genetic condition, as reported in the clinical records.

Since early 2000's it has been reported a risk factor of 24% to present supernumerary premolars

in patients that previously had a mesiodens in the premaxilla (9). With this background, this report could account another teenage patient with a history of a mesiodens and late development of supernumerary premolars in the mandible. Since our patient was eight years old, it could be suspected the presence of a mesiodens due to the lack of eruption of the permanent left central incisor and the persistence of the correspondent primary incisor. In adolescence, a suspicion criterion of supernumerary premolars was the incomplete space closure during the orthodontic treatment (10).

It was found that the crowns of the supernumerary premolars of the patient were acquiring a normal anatomy (supplementary type) and they were located at the lingual side of the normal premolars. This fact agrees with the theory of the "third dentition" (2) along with a hyperactivity of the dental lamina (5), because we suspect that the extractions of the first premolars may have initiated a stimulation for the development of supernumerary teeth.

There have been some suspicion criteria described in the literature that associate supernumerary premolars with a third dentition: its lingual position behind normal premolars, its developmental delay (even after permanent dentition had formed), its anatomical shape (similar to the normal dentition) and its multiple emergence (2). On the other hand, it has been proposed that, if remnant epithelial cells of dental lamina present a sufficient size or receive a proliferative stimuli, those cells could develop a new enamel organ and consequently, accessory dental germs that are not limited to dentition normal series (5).

Concerning treatment choice, the main reason to carry out the surgical intervention was the supernumerary premolars' potential to interfere with the normal occlusion development and compromise the space closure during orthodontic

mechanics (9). We suspect that malocclusion would remain unsolved if those impacted supernumerary premolars were only kept in clinical observation. Punctually, it was decided that the benefits of the surgical events outweighed the risks they represented (3), and we consider that the orthodontic-surgical intervention was the best treatment option to achieve space closure.

The objective of the follow-up we're managing with the patient is to discard a possible future recurrence of "sequential supernumerary teeth" along his life (4). A radiographic follow-up every 3 to 5 years has been proposed in the literature(8), but we're implementing a follow-up between 6 and 12 months to avoid a long gap of time.

An interesting fact was the finding of a positive familiar association for the supernumerary premolars, which match with the hereditary etiology of this dental anomaly (11). The patients' mother currently presents totally formed supernumerary premolars, apparently asymptomatic and without causing any pathological complication. For her in particular, and for the patients that reject the surgical intervention in general, the treatment proposal is education about the potential risks and complications of maintaining those extra teeth, and also a close and frequent follow-up (12).

Lastly, even though this paper has been limited to just one clinical case, we've found some strengths to this case report, such as the long term follow-up with favorable outcomes so far, parental responsibility and patients' positive compliance to the treatment, and early detection of the presence of multiple supernumerary teeth in order to perform a timely approach.

CONCLUSION

Multiple supernumerary premolars are a rare condition associated to syndromes, and they are even more infrequent in healthy patients. When

a “third dentition” is found during adolescence, it is advisable to conduct an orthodontic and surgical intervention to favor an occlusal harmony and a successful result, as long as the benefits of the treatment outweigh its risks. Thus, persistent malocclusion would be avoided if supernumerary premolars were intercepted timely.

CONFLICTS OF INTEREST

None of the contributing authors have a conflict of interest to declare.

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