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Research Article

SUPERNUMERARY TOOTH REMOVAL USING NITROUS OXIDE - CASE REPORT

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ABSTRACT

Introduction: Supernumerary teeth are dental germs formed in excess by hyperactivity of the dental lamina in the beginning of the odontogenesis. The use of nitrous oxide in Dentistry is one of the vastly used types of sedations, once it has a good sedative effect, thus, decreasing patients' anxiety and fear and also contributing to a slight analgesic effect.
Aim: This work aims to report the case of a patient that presents four supernumerary teeth, being classified as fourth molars. It proceeded with a surgery to remove them with the aid of conscious sedation, emphasising the most important aspects and the main divergences.
Case report: Patient male, 35 years old, black, from Juazeiro do Norte – Ceará, Brazil, went to the private clinic to remove the third and fourth molars in order to favour an orthodontic treatment. Dental extraction of all the impacted dental elements was performed under sedative effects of nitrous oxide.
Discussion: The presence of supernumerary teeth in maxilla and mandible has higher pathogenic risks, once they can become cysts and tumours.Therefore it is indicated to remove those teeth. The use of nitrous oxide is highly important to enhance conditions during procedures, if patients present anxiety or fear of dentists.
Conclusion: We conclude that the removal of the dental elements was adequate as for the orthodontic treatment and low risk of infections, as well as the use of nitrous oxide as a sedative, once the patient presented an important degree of anxiety.

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INTRODUCTION

The abnormal development of dental elements is a characteristic of hyperdontia, which is known as supernumerary teeth. It is determined by the development of a same group of dental elements or an increase in the total amount of teeth in a dental arch (AGA, 2001). The impaction of supernumerary teeth presents a greater prevalence according to their anatomical position. Amongst the supernumerary teeth, molars are mostly diagnosed in the maxilla, where they present an incidence of 88,9% (Amarante, 2003). The aetiology of this pathology is not totally elucidated. However, most of the authors believe in the theory of a hyperactivity of the initial stage of the dental lamina, thus having an increasein the amount of dental germs. Nonetheless, the association of some conditions and local factors in the period of formation of dental germs can be considered, such as: Traumas, inflammation and high blood pressure (American Dental Association, 2012). The majority of supernumerary teeth cases do not present symptomatology. For this reason, they are generally diagnosed after taking radiographs during routine examinations or beginning of orthodontic treatments (Andrade, 2002). Dental procedures can be a cause of fear and anxiety for patients, mainly when it involves surgery. Therefore, a psychological management of the patient is indispensable, together with necessary sedative measures, mainly in situations of dental fear (Andrade, 2004). It is important to provide a pleasing environment during dental procedures, through sedation with nitrous oxide. For this, however, it is fundamental that the dentist is skilled. This can decrease stress, fear and anxiety, and

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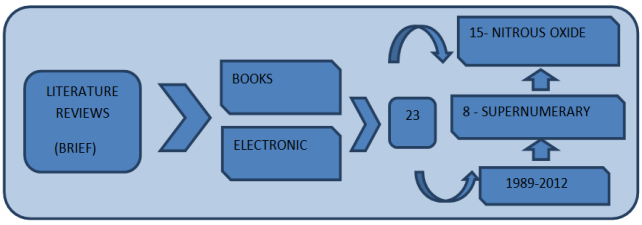
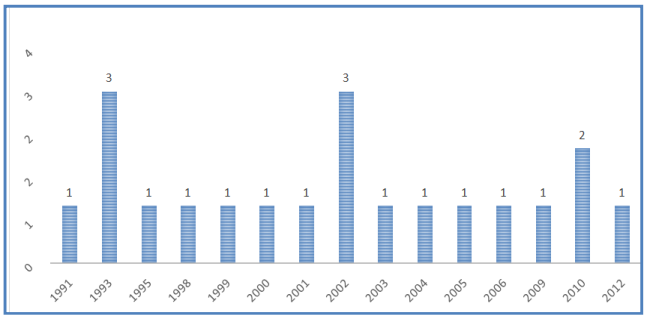
provides greater trust to the patient as well as it can decrease the amount of anaesthetic administrated (Braham, 1993). Supernumerary teeth can cause aesthetic and functional problems in patients'dental arches, because it can generate some problems such as: Compromising implant rehabilitations; tooth impactions; eruption failures; dental crowding and problems with grafts in alveolar processes (Brunick, 2010). Amongst various problems supernumerary teeth can cause, direct involvement in dental eruption chronology is an indication of removal of these elements. However, it is important that the extraction of these teeth is only performed when the root formation of the adjacent elements is complete (Cância, 2004). This work aims to report a clinical case of a patient that presents four supernumerary teeth, classified as fourth molars, proceeding with the surgical removal with the aid of conscious sedation, emphasising the most important aspects and divergences.

MATERIALS AND METHODS

A search in electronic databases and books regarding the use of nitrous oxide in Dentistry was performed, as well as the occurrence of supernumerary teeth. 23 bibliographic references were used, in which 15 refer to the use of nitrous oxide and 8 about supernumerary teeth. The works selected had years of publication from 1989 to 2012, and they were developed in humans.



analgesic properties. It was found that the risks of leaving supernumerary teeth in dental arches are considerable, once they have a high pathogenic potential.



Graph 1. Quantity of articles regarding the years of publication

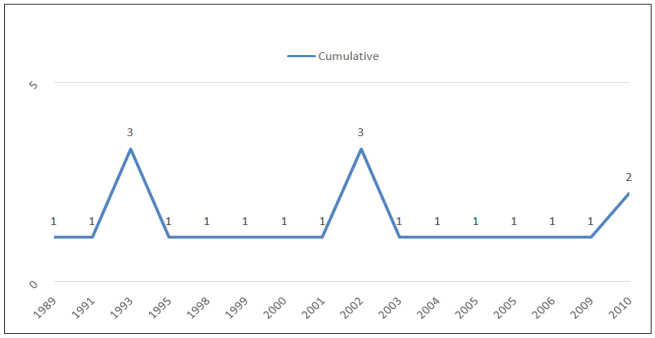


Table 1. Cumulative Graph

Case Report

Male patient, 35 years old, black, from Juazeiro do Norte, went to the private clinic with an indication of extractions in order to improve his orthodontic treatment.

Table 1. Results presented by the authors' approach

Author / year	Type of study	Number of cases	Treatment
AGA., 2001 [1]	Literature review	-	Nitrous oxide in oral surgery
Amarante et al., 2003 [2]	Literature review	-	Nitrous oxidein Dentistry
American Dental Association., 2012[3]	Literature review	-	Nitrous oxide
Andrade M., 2002[4]	Literature review	-	Nitrous oxide
Andrade, SC.; Santos, BR/ 2004 [6]	Literature review	-	Nitrous oxide
Braham et al., 1993 [7]	Literature review	-	Nitrous oxide
Cäncio A., 2004[8]	Case report	1	Extraction of supernumerary teeth using N2O2
Couto F., 2002[9]	Case report	1	Extraction of supernumerary teeth using N2O2
Creedom et al., 1995 [10]	Literature review	1	Nitrous oxide
Fernandes et al., 2005[11]	Case report	1	Surgical extraction of impacted molars
Garvey et al., 1999 [12]	Literature review	-	Supernumerary
Gil et al., 2006 [13]	Analytic	-	Nitrous oxide in oral surgery
Heluy A., 1993 [14]	Case report	1	Extraction of supernumerary teeth using N2O
Jackson DL; Johnson BS., 2002 [15]	Analytic	-	Nitrous oxide
Lacerda et al., 2010 [16]	Case report	1	Bone graft using nitrous oxide
Neville D., 1998 [17]	Literature review	1	Supernumerary
Ogle OE; Hertz MB., 2012 [18]	Analytic	-	Nitrous oxide
Patel S., 2010 [19]	Literature review	-	Nitrous oxide
Spauje et al., 1991 [20]	Literature review	-	Supernumerary
Sandoval V., 1993 [21]	Literature review	-	Nitrous oxide
Tommasi A., 1989 [22]	Literature review	-	Supernumerary
Yagiela et al., 2000 [23]	Literature review	-	Nitrous oxide

- Not reported by the author.

RESULTS

A vast use of nitrous oxide in Dentistry was observed, in order to promote sedation in patients during dental procedures. The studies also highlighted a mild analgesic effect, however there were no mechanisms of nervous interruptions, that is, it has no

After taking a panoramic radiograph, maxillary and mandibular impacted third molars were observed. However, the patient presented formation of supernumerary teeth, which after a detailed analysis, fourth molars were observed in all hemiarches.

Fig. 1. Initial orthopantomographof the patient

Fig. 2. Elements 48 and 49 to be removed

Fig. 3. Exposure of the bone

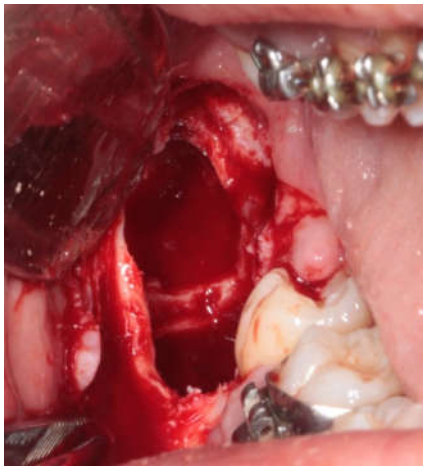


Fig.4. Preparation of the bone

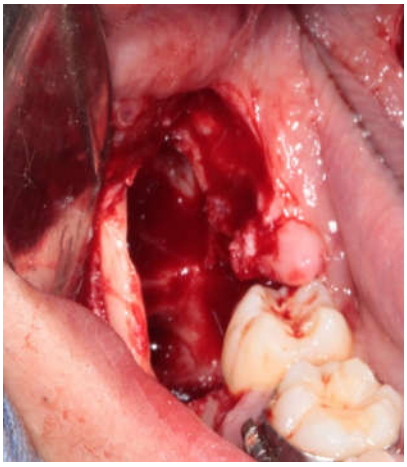


Fig. 5. Bone cavity after osteotomy andostectomy

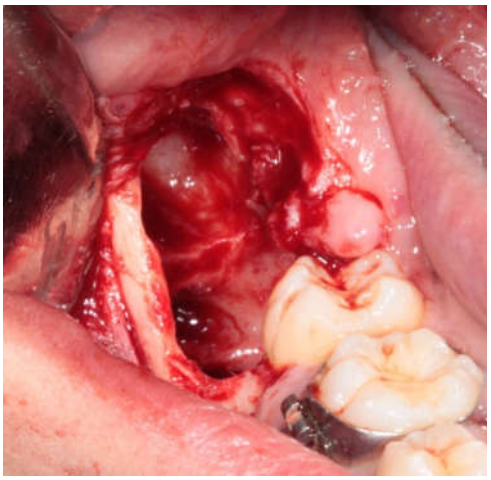


Fig. 6. Exposed bone cavity

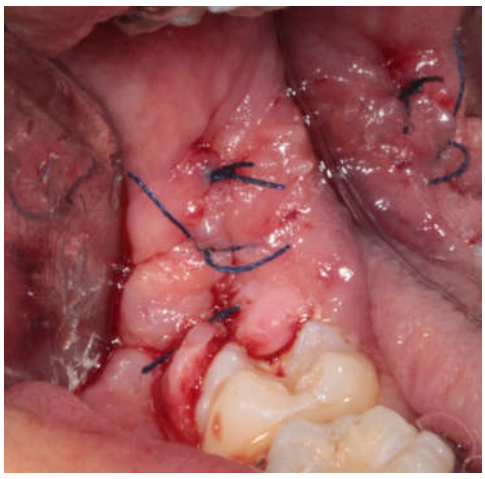


Fig. 7. Closure with suture of the operated region

In the intra oral examinations, the mucosa presented normal colour and did not present signs and symptoms of local inflammation. Through clinical and image diagnosis, the conduct taken was the extraction of the third molars of all the hemiarches to achieve the aim of the orthodontic treatment. Regarding the fourth molars, they were extracted because these teeth have the capability of becoming other pathologies such as cysts and tumours. In view of the psychological situation in which the patient was, nitrous oxide was used for conscious sedation, in order to decrease anxiety.

The patient adapted to the NO2 equipment and his vital signs were monitored during all the surgical procedure. Firstly, extra and intraoral antisepsis was performed, followed by anaesthesia of the posterior superior alveolar nerve, greater palatine nerve, inferior alveolar nerve, lingual and buccal nerves, all bilateral. Posteriorly, the extractions were performed with osteotomy and odontosection, because of the proximity risks with the mandibular canal and the maxillary sinuses. The drug therapy consisted in the administration of dexamethasone 10mg in the preoperative and ibuprofen 300mg posteriorly,

every eight hours during three days. Seven days after the surgical procedure, it was evaluated and repair was observed in the area where the extractions were performed. Symptomatology was not reported.

Fig. 8. Pulse oximeter

Fig. 9. Patient with nitrous oxide mask

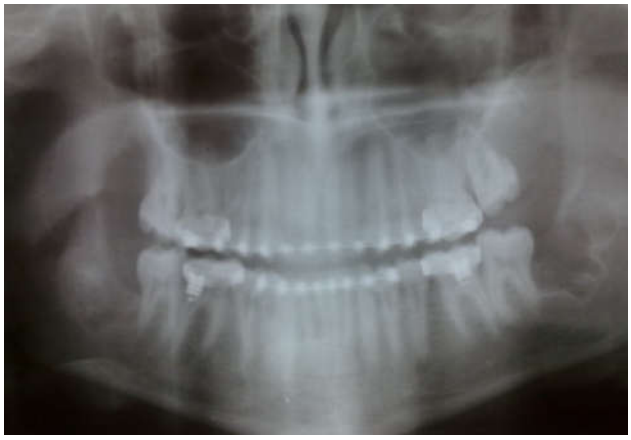


Fig.10. Final orthopantomographof the patient

DISCUSSION

It is important to consider the decision of follow up or removal of supernumerary elements, not only using the common sense as a dentist, but also calculating risks and benefits of keeping such teeth. Impacted teeth have a high pathogenic potential, and they can develop cysts and tumours (Couto, 2002; Creedon, 1995; Fernandes, 2005 and Garvey, 1999). The gas nitrous oxide (NO2) is a sedative agent via inhalation, providing a better control of anxiety and fear from patients. Other than those properties, NO2 sedates the individuals without losing consciousness (Gil, 2006). The technique of NO2 administration has a strong indication for patients with dental fear. NO2 will sedate them in a conscious way by having an anxiolytic effect and at the same time it lowers the basal metabolism, providing a greater anaesthetic effect. I also has beneficial systemic effects, where it regulates blood pressure and the percentage of blood sugar (Heluy, 1993). Nitrous oxide presents analgesic, relaxant and anxiolytic effects, where the analgesic effect comes from its sedation. The non-painful procedures promote better meetings, once one of the main complaints of pain such as anaesthesia becomes painless. For this reason, it provides a non-traumatic puncture to patients (Jackson, 2002). Absolute contraindications regarding nitrous oxide were not reported when using it as the 30% oxygen formula. As a consequence, it is vastly used for all types of patients, since the professionals are skilled and determine adequate gas formulas (Lacerda, 2010). When indications, limitations of other ways and contraindicationsare respected, the mixture of nitrous oxide plus oxygen is a great support for the control of pain and anxiety (Neville, 1998). The use of NO2 in order to promote a conscious sedation increases the pain threshold and tolerates long period procedures. However, it does not eliminate the use of local anaesthetics to control the pain, once these substances will inhibit information of painful stimuli during the intraoperative period (Ogle, 2012). Nitrous oxide is a low blood solubility gas, which after inhaled it is rapidly absorbed by the membranes of the pulmonary alveoli.Consequently, it elevates the concentrations of NO2 in the alveoli and brain. NO2 spreads through a mechanism of N2 substitution. It has a depressant effect on the central nervous system (CNS), but its mechanism of action in the CNS is not totally clear. Nitrous oxide has its effects from 3 to 5 minutes and it presents great anxiolytic actions, providing improved meetings to patients that have had previous traumas with dentalprocedures (Patel, 2010). Nitrous oxide presents concentrations that vary from 10% to 70%. Prescriptions of a specific dose that will sedate a patient will occur gradually, where the effects will be observed as time passes. The control must be well effective in order to avoid any type of reactions (Spauje, 1991). Sedation with nitrous oxide has the purpose of controlling anxiety and a bit of an analgesic effect.It is not performed in order to promote interruption of nervous transmissions of afferent fibres, that is, anaesthesia. The relaxant effect together with the psychological preparation improves the mental condition of patients, once they present a situation of increased apprehension (Sandoval, 1993). NO2 can promote cardiovascular and respiratory effects to patients. However, these effects are subclinical. It can be said that it is safe to use nitrous oxide and when it presents adverse effects, these are not clinically perceived and neither they are greatly important (Tommasi, 1989 and Yagiela, 2000).

Conclusion

The pathologies of the stomatognathic system associated with teeth must be diagnosed and adequately treated. For this, the discernment of dentists is highly important for excellent prognoses. Supernumerary teeth must be removed as they present pathogenic potentials, once it can develop cysts and tumours in the mandible and maxilla. Nitrous oxide is vastly spread in dentistry as a form of sedation without loss of consciousness. It presents a great relaxant effect and slight analgesic effects, and it can be used in dental procedures in order to reduce stress in patients with dental fear.

Conflicts of interest

The authors declare that there are no conflicts of interest.

REFERENCES

AGA: Conhecendo melhor o óxido nitroso. Rio de Janeiro: AGA; 2001. 24p.

Amarante EC, Amarante ES, Guedes-Pinto AC. Atualize-se sobre o uso da sedação consciente por óxio nitroso e oxigênio em odontologia*RevBras Odontol*.2003.;v. 60(2),p. 95-98.

American Dental Association. Guidelines for the use of sedation and general anesthesia by dentists.2012.,p. 1-14.

Andrade M. Anestesiologia: alívio imediato. *Rev ABO Nac.*2002.;v. 10,p. 82-84

Andrade SC, Santos BR. Mitos e verdades sobre o óxido nitroso. *Rev ABO Nac*. 2004.;v. 12(5),p. 306-308.

Braham RL, Bogetz MS, Kimura M, Pharmacological patient management in pediatric dentistry: anpdate. *Jour of Dent Child*. 1993.;v. 60(4-5),p. 270-280.

Brunick, A., Clark, M. Nitrous oxide and oxygen sedation: an update. *Dent. Assist.*2010..*;v.* 79 (4),p. 22-3, 26, 28-30.

Câncio, A.V. Quarto molar retido: revisão de literatura e relato de casos clínicos. *Rev. Int. Cir.Traumatol. Bucomaxilofacial.*2004.;v.2,p.225-229.

Couto F. L. E. G.. Supranumerários:revisão de literatura-relato de casos clínicos*Rev.Bras. Cir. Implantod.2002.*;v. 9,p. 150-155

Creedon RL, McDonald RE, Avery DR. Controle farmacológico do comportamento do paciente. In:.Odontopediatria. 6 ed. Rio de Janeiro: Guanabara Koogan, 1995. p 211-229.

Fernandes AV; Rocha NS; Almeida RAC; Silva EDO; Vasconcelos BCE. Fourth Impacted Molar: a Case Report*Rev. Cir. Traumatol. Buco-Maxilo-Fac*..2005.; v.5, n.2, p. 61 – 66

Garvey, M.T.; Barry, H.J.; Blake, M.Supernumerary Teeth -An Overview of Classification,Diagnosis and Management. *J. Can. Dent. Assoc.* 1999.;v.65,p. 612-616.

Gil JN, Granato R, Azambuja FG, Lima Jr SM, Claus JDP, Marin C. Avaliação da sedação por óxido nitroso em cirurgia bucal. *RevBrasCirTrau-matol Buco-Maxilo-Fac.*2006.;v.3(3),p. 80-4.

Heluy, A. Supranumerário (mesiodente) e sua influência no diastema mediano superior-relato de um caso na F.O.UFRJ. 1993. *Rev. Odontopediatr.*1993.; 3: 165-170.

Jackson, D. L., Johnson, B. S. Inhalational and enteral conscious sedation for the adult dental patient. 2002. *Dent. Clin. North Am.* 2002.; 46 (4): 781-802

Lacerda ACQ,Meneses DRST, Moreira AA. Enxerto Ósseo Autógeno com a Utilização da Sedação Consciente com Óxido Nitroso e Oxigênio: Relato de Caso. 2010*. Revista Brasileira De Cirurgia Buco-Maxilo-Facial.*2010.;v. 10,p. 103-108

Neville. D. Patologia Oral e Maxilofacial. Rio de Janeiro: Guanabara Koogan, 1998.

Ogle, O. E., Hertz, M. B. Anxiety control in the dental patient*DentClin North Am.*.2012.*;*v.56 (1),p. 1-16.

Patel, S. Is nitrous oxide a safe agent to use in conscious sedation for dentistry?. 2010. *SAAD Dig*.2010.;v. 26,p. 23-6.

Sandoval VA. Nitrous oxide: a serious look at laughing gas. 1993.*Tex Dent Jour.*1993.;v. 110(5),p. 13-6.

Spauje, Grimanis, G.A.; Kyriakides AT, Tyroupolos N.D.J. D. A survey an supernumerary molars. 1991. *Quintessence Int*. 1991.*;v.* 22,p. 989-995

Tommasi, A.F. Diagnóstico em patologia bucal.2. ed. Rio de Janeiro: Pancast, 1989

Yagiela JA, Neidle EA, Sowd FJ. Farmacologia e terapêutica para dentistas. 4 ed. Rio de Janeiro: Guanabara Koogan, 2000. p 235-51.

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