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RESEARCH ARTICLE

DIAGNOSIS AND MANAGEMENT OF SUPERNUMERARY TEETH IN PEDIATRIC POPULATION: A CASE SERIES AND A REVIEW

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ABSTRACT

A supernumerary tooth is a development anomaly of number characterized by the presence of tooth in addition to the normal series. The prevalence of this anomaly varies between 0.15% and 1.9%. Clinical and radiological signs are constant. Surgical extraction is an unavoidable therapeutic step that can be associated to interceptive or orthodontic treatment. **Methods:** We performed a review of literature about diagnosis and management of supernumerary teeth in pediatric population. PubMed, Cochrane library and Google scholar were databases used. We reported 4 clinical cases of young patients with different types and numbers of supernumerary teeth, treated at the principal military hospital of Tunis. We noticed clinical signs, radiological ones and detailed treatment plan. **Results:** Thirteen articles (13) were reviewed. Boys were more affected than girls with sex ratio 2:1. Mean age at diagnosis was 9.76 YO. Clinical signs associated were respectively delayed dental eruption (N =) 61.53 %, swelling (N=4) 30.76 %, space loss (N=3) 23.07% and over-retained primary teeth (N=3) 23.07%. Besides , impacted tooth (N=5) 38.46% and radio-opaque images (N=10) 76.92 % were the most radiological findings associated. Mean number of supernumerary teeth diagnosed per patient was 1.69. Mesiodens (N= 5) 38.46%, odontoma (N= 3)23.07% , dens invaginatus (N=1)= 7.69% and tooth like appearance(N=1)7.69 % were most subtype described. Regular follow-up of 5.92 months, was mentioned in (N=9) 69.23% of the retained articles. **Conclusion:** Supernumerary teeth requires a multidisciplinary management Ideally, examination and treatment planning should be undertaken within pediatric dentist , oral surgeon and orthodontist.

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INTRODUCTION

A supernumerary tooth is a development anomaly of number characterized by the presence of tooth in addition to the normal series. The prevalence of this anomaly varies between 0.15% and 1.9%. It is more frequent in boys than in girls , with a sexe ratio 2: 1. Supernumerary teeth can be discovered fortuitously during radiological examination or following call clinical signs. The diagnosis commonly occurs between 7 and 9 years old because of the complaint of a delayed dental eruption in most of cases. (1) The aim of the present study is to review the diagnosis and the management modalities of supernumerary teeth in pediatric population , throughout a case series and a review of literature

MATERIELS AND METHODS

We performed a review of literature about diagnosis and management of supernumerary teeth in pediatric population. PubMed, Cochrane library and Google scholar were databases used. The keywords used were mesiodens , supernumerary teeth and management. Among the fifty (50) included articles, only thirteen (13) have been retained in our review [Figure 1]. We reported 4 clinical cases of young patients with different types and numbers of supernumerary teeth ,treated at the principal military hospital of Tunis. We noticed clinical signs, radiological ones and detailed treatment plan.

CASE SERIES

Case n° 1: A 9 year old boy was sent to the department of dental medicine at the principal military hospital of Tunis , for delayed eruption of the right permanent central and lateral maxillary incisors. No antecedent of dental trauma at early childhood has been reported. Clinical examination revealed the persistence of the right temporary maxillary incisors (51,52,52 bis). [Figure 2A]

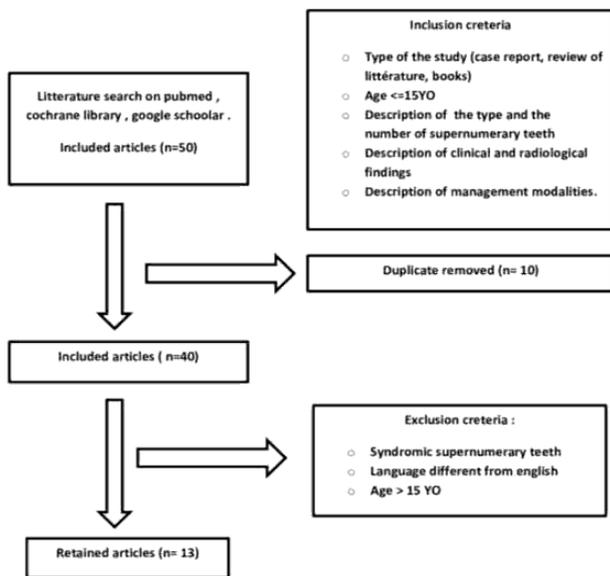


Figure 1. Flowchart of review of literature

The panoramic radiograph and CBCT revealed a supernumerary formation blocking the eruption of the impacted right central maxillary incisor [Figure 2D]. First, surgical extraction of the tooth like formation as long as temporary incisors, was done. [Figure 2D] Then, removable plate of expansion was supplied as a space maintainer. [Figure 2E]. At two months of follow-up, a favorable evolution of the eruptive axis of central and lateral maxillary incisors was noticed at the panoramic radiograph. The patient was then followed-up monthly.



Figure 2: A: Persistence of the right temporary maxillary incisors (51,52,52 bis). B ,C: Surgical extraction of the mesiodens , two temporary teeth and supplemental one D: Axial CBCT cut showing the supernumerary teeth in the incisor region. The central and the lateral maxillary incisors are a bit overlapped. E: Delivery of a removable orthodontic appliance playing the role of space maintainer and corrector of DDM

Case n°2: An 8 year old boy was sent to the department of dental medicine at the principal military hospital of Tunis, for delayed eruption of the right permanent central maxillary incisor. Clinical examination revealed a palatal swelling as long as a partially erupting tooth at the site of the permanent central maxillary incisor [Figure 3A]. Radiological exploration has proved that there has been two conical mesiodenses blocking the eruption of the right central maxillary incisor , as long as severe signs of dento-maxillary disharmony. Surgical extraction of two mesiodenses was done [Figure 3B]. Spontaneous eruption of the blocked incisor was witnessed after two months of follow-up.



Figure 3: A: A mesiodens is erupting in the site of the right central maxillary incisor B:Surgical extraction of two mesiodenses C: Clinical view after 1 month of healing D: Clinical view after 2 months of surgical extraction E: Clinical view after 6 months of maxillary expansion

A plate of expansion was then applied. At six months of follow-up, we noticed a favorable evolution and a sufficient space for the eruption of the central maxillary incisor [Figure 3C, D, E]

Case n° 3: A 9 year old boy was sent to the department of dental medicine at the principal military hospital of Tunis, for delayed eruption of the right and left permanent central maxillary incisors. No history of dental trauma has been reported. Retro-alveolar radiograph confirmed the existence of two mesiodenses blocking the permanent central incisors eruption [Figure 3A,B]. Surgical extraction of two tuberculate mesiodenses was done [Figure 3C]. Two months later, spontaneous eruption of the retained teeth was noticed. The patient was followed-up regularly until 8 months. [Figure 3 D,C]



Figure 4. A- Delayed eruption of (11 and 21) B-Retroalveolar radiograph showing two supernumerary teeth blocking the 11, and 21 C: Surgical extraction of both mesiodenses situated at a palatal position D- Onset of the eruption of central maxillary incisors at T 2 months E- Eruption of both central maxillary incisors slightly overlapped

Age at diagnosis (years)	Gender	Clinical signs				Radiological findings		Type of ST*	Number Of ST*	Management	Period of follow-up	Authors
		Delayed eruption	Over-retained Primary tooth	Space loss	Swelling	Impacted tooth	Radio-opaque images					
13	Male	+	-	+	-	+	+	Mesiodens	4	*Surgical extraction *Removable partial denture	1 month	Mandeep Rallan (7)
9	Male	+	-	-	-	+	-	Compound odontoma	7	*Surgical enucleation + follow-up *Orthodontic treatment if no eruption after 6 months	3 months	Abul khair Zalan, Anser Maxood, Pahwasha Baber(2)
9	Male Twins (A,B)	+	+	+	+	+	+	Mesiodens	2	*surgical extraction + wait for spontaneous eruption of the impacted teeth + Palatal expansion *Orthodontic treatment	A : 10 months B : 12 months	Carla Vecchione Gurgel,1 Ana Lidia Soares Cota,1 Tatiana Yuriko Kobayashi,1 Salete Moura Bonifacio Silva(1)

*ST : Supernumerary teeth Table 1

Age at diagnosis (Years)	Gender	Clinical signs				Radiological findings		Type of ST*	Number Of ST*	Management	Period of follow-up	Authors
		Delayed eruption	Over-retained Primary tooth	Space loss	Swelling	Impacted tooth	Radio-opaque images					
8-9	-	+	+	+	+	+	+	-	-	*Space provision *Removal of eruption barrier *Surgical exposure of the incisor(+/-) subsequent orthodontic traction *Auto-transplantation	*Age:9 YO → follow-up 9-12 months *Age:9YO → open or closed surgical exposure + orthodontic attachment	Jadbinder Seehra , Omar Yaqoob , Shruti Patel , Julian O'Neill(3)
7-14	*37 male *18 female	+	-	-	-	+	+	Mesiodens: *conical *tuberculate* eumorphic *molariform	*1 (50.90%) *multiple (49.09%)	*Surgical + orthodontic treatment (45.45%) *Surgical treatment without orthodontic treatment (54.55%)	-	Krishnan Ramesh, Karthik Venkataraghavan, Shiji Kunjappan , Maya Ramesh (4)

*RME : Rapid maxillary expansion / * ST :Supernumerary teeth Table 1

Age at diagnosis (Years)	Gender	Clinical signs				Radiological findings		Type of ST*	Number Of ST*	Management	Period of follow-up	Authors
		Delayed eruption	Over-retained Primary tooth	Space loss	Swelling	Impacted tooth	Radio-opaque images					
8-9	-	+	+	+	+	+	+	-	-	*Space provision *Removal of eruption barrier *Surgical exposure of the incisor(+/-) subsequent orthodontic traction *Auto-transplantation	*Age:9 YO → follow-up 9-12 months *Age:9YO → open or closed surgical exposure + orthodontic attachment	Jadbinder Seehra , Omar Yaqoob , Shruti Patel , Julian O'Neill(3)
7-14	*37 male *18 female	+	-	-	-	+	+	Mesiodens: *conical *tuberculate* eumorphic *molariform	*1 (50.90%) *multiple (49.09%)	*Surgical + orthodontic treatment (45.45%) *Surgical treatment without orthodontic treatment (54.55%)	-	Krishnan Ramesh, Karthik Venkataraghavan, Shiji Kunjappan , Maya Ramesh (4)

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Age at diagnosis (Years)	Gender	Clinical signs				Radiological findings		Type of ST*	Number Of ST*	Management	Period of follow-up	Authors
		Delayed eruption	Over-retained Primary tooth	Space loss	Swelling	Impacted tooth	Radio-opaque images					
8-9	-	+	+	+	+	+	+	-	*Space provision *Removal of eruption barrier *Surgical exposure of the incisor(+/-) subsequent orthodontic traction *Auto-transplantation	*Age-9 YO → follow-up 9-12 months *Age-9YO → open or closed surgical exposure + orthodontic attachment	Jadbinder Seehra , Omar Yaqoob , Shiruti Patel , Julian O'Neill(3)	
7-14	*37 male *18 female	+	-	-	-	+	+	Mesiodens: *conical *tuberculate* eumorphic *molariform	*1 (50.90%) *multiple (49.09%)	*Surgical + orthodontic treatment (45.45%) *Surgical treatment without orthodontic treatment (54.55%)	-	Krishnan Ramesh, Karthik Venkataraghavan, Shiji Kunjappan, Maya Ramesh (4)

*RME : Rapid maxillary expansion / * ST : Supernumerary teeth Table 1

Age at diagnosis (years)	Gender	Clinical signs				Radiological findings		Type of ST*	Number Of ST*	Management	Period of follow-up	Authors
		Delayed eruption	Over-retained Primary tooth	Space loss	Swelling	Impacted tooth	Radio-opaque images					
14	Male	+	-	-	-	+	-	Mesiodens	1	*Surgical extraction of supernumerary tooth, central maxillary incisor, and cyst enucleation *Re-implantation of the extracted right first maxillary central incisor	1 year	Ourtani H et al
9	Male	+	+	-	-	+	+	Mesiodens	2	*Surgical extraction of mesiodens, Extraction of 2	1 month	Bourguiba E et al
8	Male	+	-	+	+	+	+	Mesiodens (Conical Tuberculate)	2	*Surgical extraction of two mesiodens *Removable orthodontic appliance	6 months	Bourguiba E et al
9	Male	+	-	+	+	-	+	Mesiodens (Conical)	2	Surgical extraction of 2 mesiodens	6 months	Ourtani H et al

*ST : Supernumerary teeth

Table 1

Case n°4: A 14 year old boy was sent to the department of dental medicine at the principal military hospital of Tunis, for a delayed eruption of the right permanent central maxillary incisor. Clinical examination revealed a conical erupted tooth in the site of the right central maxillary incisor [Figure 5 A]. Scanner’s axial cuts had shown a supernumerary conical tooth and a sub-nasal horizontal position of the right central maxillary incisor related to a cystic lesion [Figure 5B]. First, surgical extraction of the supernumerary tooth and the impacted central maxillary incisor as long as cystic enucleation were done [Figure 5 C,D]. Then, re-implantation of the extracted right first maxillary central incisor splinted for two weeks, was realized. [Figure 5 F] Finally, endodontic treatment of the re-implanted tooth after periodontal healing was done. At 1 year of follow-up, stable occlusion and normal periodontal state were noticed [Figure 5G]

RESULTS

Thirteen articles (13) were reviewed. Non syndromic supernumerary teeth were reported in all retained articles. Boys were more affected than girls with sex ratio 2:1. Mean age at diagnosis was 9.76 years old. Clinical signs associated were respectively delayed dental eruption (N =6). 61.53 %, swelling (N=4) 30.76 %, space loss (N=3) 23.07% and over-retained primary teeth (N=3) 23.07%. Besides, impacted tooth (N=5) 38.46% and radio-opaque images (N=10) 76.92 % were the most radiological findings associated. Mean number of supernumerary teeth diagnosed per patient was 1.69. Mesiodens (N= 5). 38.46 %, odontoma (N= 3)23.07% , dens invaginatus(N=1)= 7.69% and tooth like appearance (N=1) 7.69 % were most subtype described.

Management of supernumerary teeth was surgical extraction associated to orthodontic treatment if the tooth eruption was compromised. Regular follow-up of 5.92 months, was mentioned in (N=9) 69.23% of the retained articles [TABLE 1]



Figure 5 A: Conical erupted tooth in the site of the right central maxillary incisor **B:** Scanner axial cut showing a cystic lesion related to the central maxillary incisor **C,D:** Surgical extraction of the supernumerary tooth and the impacted central maxillary incisor as long as cystic enucleation. **E:** Endodontic treatment of the re-implanted tooth after periodontal healing **F:** Re-implantation of the extracted maxillary central incisor and semi-rigid dental splint during two weeks **G:** Endo-oral view at T 1 year of control showing stable occlusion and no periodontal complication

DISCUSSION

A supernumerary tooth is a development anomaly of number characterized by the presence of tooth in addition to the normal series. The prevalence of this anomaly varies between 0.15% and 1.9%. It is more frequent in boys than in girls, with a sex ratio 2: 1 (1). Supernumerary teeth can be discovered accidentally during radiological examination. The diagnosis commonly occurs between 7 and 9 years old because of the complaint of a delayed dental eruption in most of cases (1). Our review of literature and case series has detailed almost all subtypes of supernumerary teeth, as long as oro-dental signs associated. (4,8,9,11). In fact, delayed incisor's eruption is the most common sign reviewed, considering that mesiodens are the most frequent type described. (6,7,12). Besides, surgical extraction is an unavoidable treatment step in case of supernumerary teeth. (4,5,7-9) That one may be associated to orthodontic treatment if spontaneous eruption is not possible. (3) In fact, the earlier the treatment is, the better the prognosis will be (3). Furthermore, our case series included a rare but effective, treatment procedure by reimplanting the impacted tooth because of late management and very bad eruptive prognosis. Last but not least, we reported throughout our case series and review, the efficiency of early interceptive treatment in this clinical condition.

It permitted the correction of dento-maxillary disharmony and prevented long periods of orthodontic treatment later (5, 7). In fact, patient compliance must be assessed, when treating

supernumerary teeth. Some young patient does not accept surgical treatment and orthodontic one with fixed or removable appliances (3). Therefore, long periods of follow-up were not reported in our review and case series. That may cause doubts about normalized dental eruption especially when spontaneous one did not occur.

CONCLUSION

Supernumerary teeth require a multidisciplinary management. Ideally, examination and treatment planning should be undertaken within pediatric dentist, oral surgeon and orthodontist. Early diagnosis and management may prevent teeth inclusion, severe malocclusion and long periods of management.

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