




CASE REPORT

Conservative management of dentigerous cyst in children: Report of two clinical cases

Chaima Khalifa^{1,2}  | Maroua Garma^{1,2}  | Rihab Mabrouk³  | Afef Slim^{1,2} | Adel Bouguezzi^{1,2} | Jamil Selmi^{1,2}

¹Department of Oral medicine and Oral Surgery, Dental Clinic of Monastir, Monastir, Tunisia

²Faculty of Dental Medicine, Laboratory of Oral Health and Maxillofacial Rehabilitation (LR12ES11), University of Monastir, Monastir, Tunisia

³Department of Pediatric and Preventive Dentistry, Dental Clinic of Monastir, Monastir, Tunisia

Correspondence

Chaima Khalifa, Department of Oral Medicine and Oral Surgery, University Dental Clinic of Monastir, Monastir, Tunisia.

Email: chaimakhalifa@yahoo.com

Abstract

The dentigerous cyst is the second most common odontogenic. The prevalence rates ranging from 0.8% to 3.6% in the general population. It affects people especially at the second and third decade of life with a male predilection. It presents a preference for the mandibular region particularly for the second lower premolar. Surgical marsupialization or decompression are the most conservative treatment modalities as it prevents the risks of cyst removal as nerve injuries and preserves the unerupted tooth. Two clinical cases of two young patients presenting a dentigerous cyst involving impacted teeth, which were successfully treated by decompression will be reported in order to highlight the benefits and limits of cyst decompression as well as detailing its operating protocol and its instructions.

KEYWORDS

conservative, dentigerous cyst, enucleation, impacted teeth, marsupialization, odontogenic cyst

1 | INTRODUCTION

Odontogenic cysts are a fairly common group of lesions, secondary to disorders of development of the dental organ or due to inflammatory origin.¹

The morphological, clinical and evolutionary diversity of the various lesions led to a histological classification, today the most used.²

Dentigerous cysts represent 24% of all epithelium lined jaw cysts³ and are the second most common odontogenic cysts. They show a male predilection and a preference regarding mandibular region. It affects people more frequently at the second and third decades of life.^{3,4}

This pathologic entity is associated with an impacted tooth, more commonly with the third molar and canine

due their frequency of impaction.⁵ Probably, the formation of dentigerous cyst is due to the accumulation of fluid resulting from pressure exerted by the potential of the eruption of the impacted tooth on the follicle.⁴

Clinically, a dentigerous cyst is asymptomatic unless it is inflamed.¹ Radiographically, dentigerous cysts appear as well-demarcated, unilocular radiolucency located at the cemento-enamel junction of the tooth. They may appear radiographically similar to an odontogenic keratocyst or ameloblastoma.² The presence of dentigerous cysts can cause severe consequences, such as pathological fracture and facial asymmetry.¹ Nevertheless, their surgical removal might present complications, such as nerve injuries, postoperative infections, and iatrogenic mandibular fractures. Therefore, the clinical conduct regarding those

cysts should weigh the risks of removal and benefits of tooth preservation.⁶ Hence the interest of surgical marsupialization or decompression as the most two conservative treatment option described for the management of dentigerous cyst.⁷

The aim of this article was to present two cases reports of two young patients presenting a dentigerous cyst involving impacted teeth, which were treated by decompression, in order to highlights this alternative treatment option, detailed its steps, benefits and limits.

2 | CASE 1

A 13-year-old patient was referred to the department of oral medicine and oral surgery of the university dental clinic of Monastir, Tunisia by the pedodontic department for a swelling at the right mandibular vestibule.

The Intraoral examination showed a hard-bony swelling on the right body of the mandible (Figure 1).

The lacteal right mandibular canine and first molar were decayed. The panoramic radiograph (OPG) showed a large and well-defined osteolytic lesion including a canine and first premolar still impacted (Figure 2).

The 3D radiographic examination using CBCT (Cone Beam computed tomography) confirmed the limits of the lesion. They were well-defined, pushing back without invading the surrounding anatomical structures over the entire edges of the lesion measuring about 2 cm in diameter (Figure 3).

Clinical and radiological finding were in favor of dentigerous cyst related to the impacted first premolar and the canine, less probable to be a radicular cyst related to deciduous teeth.

Having regard to the patient's age and motivation, decayed temporary teeth were removed and cyst decompression was performed under local anesthesia to preserve the impacted teeth and let chance to their natural eruption. A biopsy for histopathological examination was done, and it confirmed the diagnosis of a dentigerous cyst.

To avoid mucosa cicatrization, the device used was an obturator in acrylic resin incorporated in a partial removable denture (Figure 4). Some recommendations were given to the parents such as good irrigation of the cystic cavity twice daily with 10 mL of 0.2% chlorhexidine through a syringe.

He was seen once a week and was examined radiographically bimonthly. Six months after the surgery, the occlusal surface of the second premolar could be seen clinically, beginning of bone formation and modification of the 43-axis orientation. After 1 year, a panoramic radiograph revealed complete bone remodeling of the area with no recurrence of the cyst (Figure 5), the eruption of the first premolar and the complete straightening of the axis of the canine, which was horizontal (Figure 6).



FIGURE 1 Hard-bony swelling on the right body of the mandible.



FIGURE 2 Radiographic image showing a large and well-defined osteolytic lesion including a canine and first premolar still impacted.

3 | CASE 2

A 7-year-old female patient was referred to the department of oral medicine and oral surgery of the university dental clinic of Monastir, Tunisia by her dentist while discovering accidentally osteolytic lesion surrounding the impacted maxillary left canine. A cone beam computed tomography was requested to precisely determine the limits of the lesion, which were well-defined and preserving the integrity of surrounding tissues. (Figure 7).

A provisional diagnosis of dentigerous cyst was made. Thus, the therapeutic approach decided was cyst decompression in order to preserve the definitive canine. So, lacteal maxillary left canine was extracted under local anesthesia. A specimen of the cyst membrane was sent for histological examination, which confirmed the diagnosis of dentigerous cyst. A shortened stent was inserted and sutured at the site to maintain the drainage and the opening of the cavity (Figure 8). The patient was instructed to irrigate the cavity three times per day with a saline solution or chlorhexidine.

FIGURE 3 CBCT showing a radiolucent lesion pushing back without invading the surrounding anatomical structures over the entire edges of the lesion measuring about 2 cm in diameter.

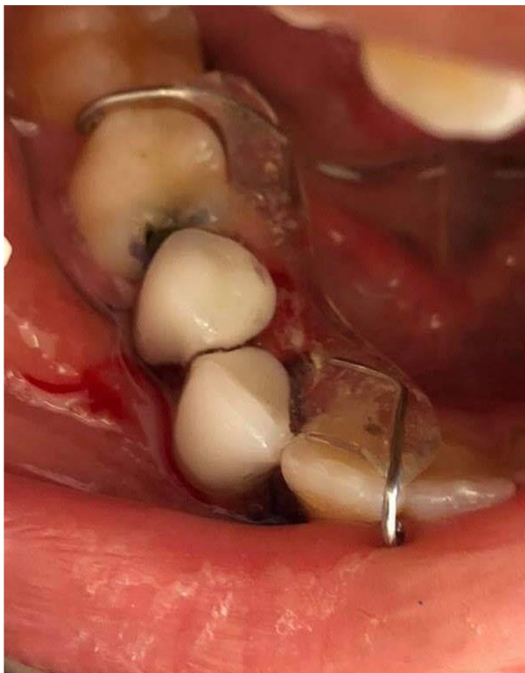
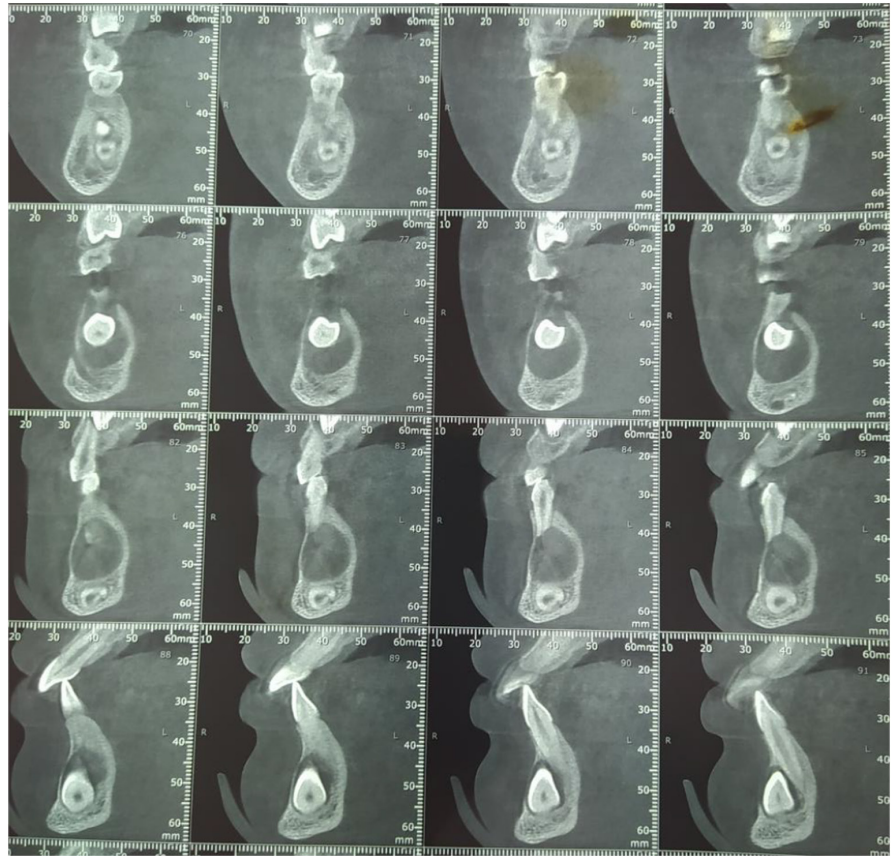


FIGURE 4 Obturator in acrylic resin incorporated in a partial removable denture in place.

Patient was recalled for regular clinical and radiological follow-up, after 3 days, 10 days, and 1 month. Three months later, bone remodeling of the cyst cavity was obtained (Figure 9). The speed of the eruption and

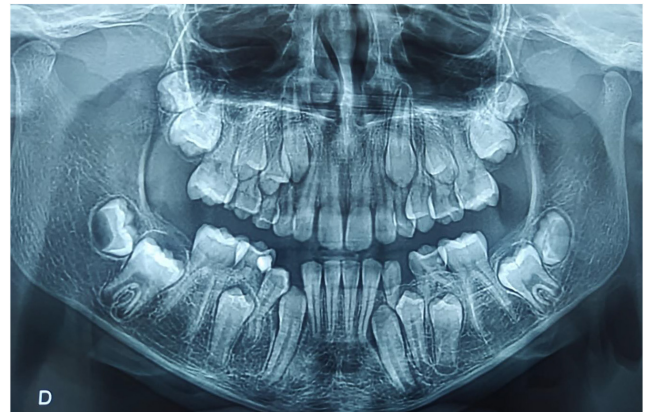


FIGURE 5 After 1 year, a panoramic radiograph revealing complete bone remodeling of the area with no recurrence of the cyst.

the degree of root formation of the impacted canine was judged normal.

4 | DISCUSSION

The dentigerous cyst is one of the most frequent cysts of the maxilla. It is observed at all ages, with a higher frequency between the 2nd and 4th decade in men. It is most common in the 3rd molar, the maxillary canine and the

second mandibular premolar.^{2,8} The pathogenesis of the dentigerous cyst is related to pressure from an erupting tooth on the follicle that may obstruct circulation thus inducing to exudate accumulation between the reduced adamantin epithelium and the crown of the tooth.⁹

It is a slow-growing odontogenic cyst that is frequently asymptomatic.⁸ With the progressive increase in cystic volume, we can found a swelling of the external table. Facial deformity is only possible if the cyst is large and vestibular. The lining mucosa may be normal, congestive or appear slightly bluish. Progressively, the lesion evolves towards the externalization phase where clinically, a depressible mass is palpable. It is fluctuating and painless with a sharp and elastic thinned bone edge.¹⁰ Radiologically, it appears as a well-limited radiolucent image surrounding a crown

of a still impacted tooth.¹¹ The dentigerous cyst can lead to bone destruction, displacement of neighboring teeth and resorption of their roots. It also prevents the eruption of the permanent teeth associated with the cyst.¹² The appropriate treatment is always surgical and can be conservative or radical.¹³

Radical surgical treatment consist in enucleation of the cyst and the removal of involved tooth, which is a drastic option causing the loose of value tooth such as the canine.¹⁴

The most two recommended conservative options are marsupialization and decompression, which offer the possibility of preserving the impacted tooth.¹⁵

Marsupialization is to be distinguished from cystic decompression. Marsupialization is probably the first treatment recommended of cysts and was suggested by Partsch in German literature in the late nineteenth century. It consists of creating a large window in the cyst cavity.¹⁶ This opening should be maintained by suturing the cystic membrane to the buccal mucosa. It is a well-accepted technique for primary treatment of large cystic lesions.¹⁷ Decompression, as described by Thomas, is based on Partsch's marsupialization technique, but he proposes drainage through a smaller window that is often held open with the aid of devices (tube, stent).¹⁸ Actually, many devices have been described: stents, stents attached with minivis, iodoform gauze pack, decompression tubes or obturators.¹⁹ Regardless the technique used, a specimen of the cyst membrane is necessary in order to perform an anatomopathological examination. Indeed, the irrigation of the cyst cavity by a saline or antiseptic solution is



FIGURE 6 A year later, eruption of the first premolar and the complete straightening of the axis of the canine.

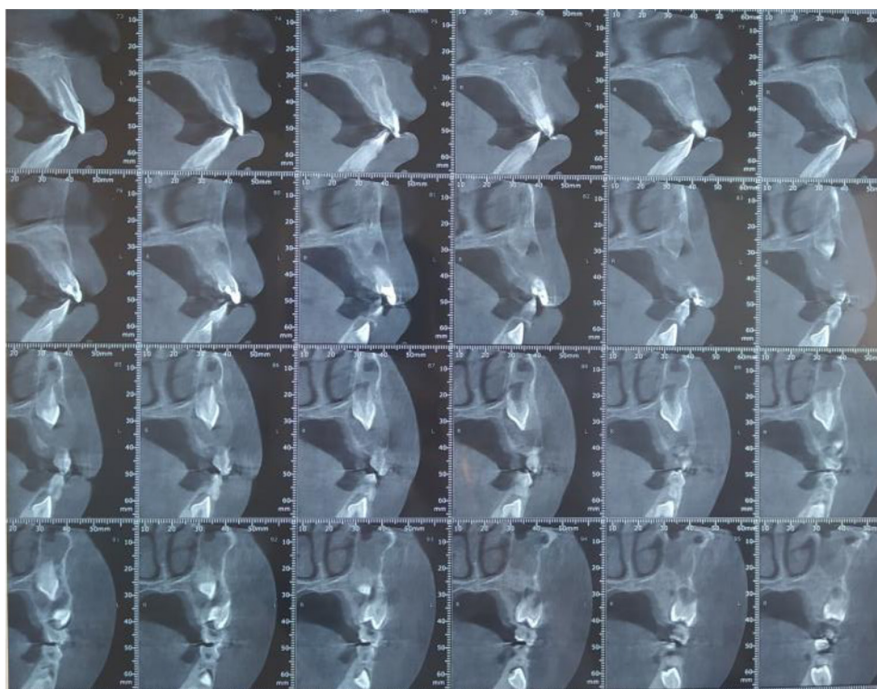


FIGURE 7 CBCT showing a well-defined radiolucency preserving the integrity of surrounding tissues.



FIGURE 8 A shortened stent was inserted and sutured at the site.



FIGURE 9 Three months later, bone remodeling of the cyst cavity was obtained.

mandatory to avoid infection. No specific technique has been demonstrated to be superior.²⁰

There are various factors to take into consideration when performing marsupialization such as patient age, size and cyst location and mainly patient cooperation.²¹ This therapeutic approach can be considered alone or associated to subsequent enucleation.²²

The aim of these two treatments is the same, to keep the cyst open in the oral cavity in order to reduce the intracystic pressure. Therefore, the expression of IL-1 α and other inflammatory cytokines will decrease allowing the reossification of the defect.¹¹

Usually, it is indicated in the cases of benign cystic lesions, such as dentigerous cyst, Odontogenic keratocyst, cystic ameloblastoma and radicular cyst.²³ Thus, it has been accepted as a first option for the treatment of large cystic lesions no matter what diagnosis it is. It had been used alone, or combined with tooth extraction, tooth traction, enucleation, curettage, resection, Carnoy solution... The reintervention is often seen in the cases of odontogenic keratocyst and cystic ameloblastoma in order to eliminate the residual lesion because of their aggressive character and their high recurrence rate.¹⁷

Marsupialization and decompression are useful in cases of cysts associated with mandibular premolars and maxillary canines. As it was reported in the two clinical cases, the decompression was very beneficial and allowed the preservation and the eruption of involved teeth.²⁴

In comparison with other treatment modalities, they carry the lowest risk of recurrence and the least morbidity. In fact, they promote the eruption of teeth retained by the cyst.²³ They also offer the possibility of preserving teeth having functional interest with or without performing orthodontic traction. In case of no bone remodeling or regression of clinical symptoms, enucleation with removal of the tooth can be considered. Although the predictive criteria for the eruption of the cyst-associated tooth are not well known, the size of the cystic lesion is not a predictor factor. The most favorable factors are as follows: age (<10 years), depth of inclusion and germ angulation (<25°).^{21,26}

Tooth eruption does not always occur spontaneously after decompression or marsupialization specially when there is not enough space to allow eruption or no favorable axis is available.^{21,27}

Thus, orthodontic traction can be performed later. Combined orthodontic-surgical techniques may help promote cyst-related tooth eruption. The goals of this combination are as follows: Traction of the tooth associated to cysts, open or maintain space, correct tooth position after marsupialization or decompression.²⁸

Cystic decompression is a conservative and minimally invasive technique that has many advantages. It can avoid injury to adjacent anatomical features as the inferior alveolar nerve, damage to the floor of the maxillary sinus and nasal cavity and mandible fracture. Also, it preserves the vitality of certain teeth and reduces their mobility. Besides, it can assure partial or total reossification of the site, avoiding the need for bone filling and facilitate implant placement.²⁹

Despite its benefits over enucleation, decompression has some disadvantages. The persistence of pathological tissue in situ and the impossibility of performing an anatomicopathological analysis of the entire lesion is the major inconvenience. It's also a long treatment that requires regular check-ups with the dentist. Daily local care is required. It requires, as well a great cooperation from the patient and his parents. In some cases, a second intervention is necessary if the tube is removed or the cyst has not regressed completely or if the histological examination does not confirm the suspected diagnosis.^{3,25}

AUTHOR CONTRIBUTIONS

Chaima Khalifa: Writing – original draft. **Garma Maroua:** Supervision. **Rihab Mabrouk:** Resources. **Afef Slim:** Validation. **Adel Bouguezzi:** Validation. **Jamil Selmi:** Validation.

ACKNOWLEDGMENTS

None.

FUNDING INFORMATION

The authors declare that they have no sources of funding for this particular study.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest or sources of funding for this particular study.

ETHICS APPROVAL

Our institution does not require ethical approval for reporting individual cases or case series.

CONSENT

Written informed consent was obtained from the patient for his anonymized information to be published in this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Chaima Khalifa  <https://orcid.org/0000-0002-2867-2824>

Maroua Garma  <https://orcid.org/0000-0002-1513-1914>

Rihab Mabrouk  <https://orcid.org/0000-0001-8989-3498>

REFERENCES

- Rajendra Santosh AB. Odontogenic cysts. *Dent Clin N Am*. 2020;64(1):105-119. doi:10.1016/j.cden.2019.08.002
- Suluk-Tekkeşin M, Wright JM. The World Health Organization classification of odontogenic lesions: a summary of the changes of the 2017 (4th) Edition. *Turk Patoloji Derg*. 2018;34(1). doi:10.5146/tjpath.2017.01410
- Şahin O. Conservative management of a dentigerous cyst associated with eruption of teeth in a 7-year-old girl: a case report. *J Korean Assoc Oral Maxillofac Surg*. 2017;43(Suppl 1):S1-S5. doi:10.5125/jkaoms.2017.43.S1.S1
- Contar CM, Thomé CA, Pompermayer A, Sarot JR, Vinagre RO, Machado MÂ. Marsupialization of dentigerous cyst: report of a case. *J Maxillofac Oral Surg*. 2015;14(Suppl 1):4-6. doi:10.1007/s12663-011-0172-6
- Vigneswaran AT, Shilpa S. The incidence of cysts and tumors associated with impacted third molars. *J Pharm Bioallied Sci*. 2015;7(Suppl1):S251-S254. doi:10.4103/0975-7406.155940
- Mello FW, Melo G, Kammer PV, Speight PM, Rivero ERC. Prevalence of odontogenic cysts and tumors associated with impacted third molars: a systematic review and meta-analysis. *J Craniomaxillofac Surg*. 2019;47:996-1002.
- Demiriz L, Misir AF, Gorur DI. Dentigerous cyst in a young child. *Eur J Dent*. 2015;9(4):599-602. doi:10.4103/1305-7456.172619
- Robinson R. Diagnosing the most common odontogenic cystic and osseous lesions of the jaws for the practicing pathologist. *Mod Pathol*. 2017;30(Suppl 1):S96-S103. doi:10.1038/modpathol.2016.191
- Paul W, Flint MD, FACS. Odontogenesis, odontogenic cysts, and odontogenic tumors. In: Hellstein JW, Timmons SR, eds. *Cummings Otolaryngology: Head and Neck Surgery*. 7th ed. Elsevier Health Sciences; 2021.
- Manor E, Kachko L, Puterman MB, Szabo G, Bodner L. Cystic lesions of the jaws- a clinicopathological study of 322 cases and review of the literature. *Int J Med Sci*. 2012;9(1):20-26. doi:10.7150/ijms.9.20
- Rajae EG, Karima EH. Dentigerous cyst: enucleation or marsupialization? (a case report). *Pan Afr Med J*. 2021;40:149. doi:10.11604/pamj.2021.40.149.28645
- Zerrin E, Husniye DK, Peruze C. Dentigerous cysts of the jaws: clinical and radiological findings of 18 cases. *J Oral Maxillofac Radiol*. 2014;2:77-81.
- Kumar Mohapatra P, Joshi N. Conservative management of a dentigerous cyst associated with an impacted mandibular second premolar in mixed. *J Dent Res Dent Clin Dent Prospect*. 2009;3(3):98-102. doi:10.5681/joddd.2009.025
- Deboni MC, Brozoski MA, Traina AA, Acay RR, Naclério-Homem M. Surgical management of dentigerous cyst and keratocystic odontogenic tumor in children: a conservative approach and 7-year follow-up. *J Appl Oral Sci*. 2012;20(2):282-285. doi:10.1590/s1678-77572012000200025
- Ghandour L, Bahmad HF, Bou-Assi S. Conservative treatment of Dentigerous cyst by marsupialization in a young female patient: a case report and review of the literature. *Case Rep Dent*. 2018;2018:7621363. doi:10.1155/2018/7621363
- Wushou A, Zhao YJ, Shao ZM. Marsupialization is the optimal treatment approach for keratocystic odontogenic tumour. *J Craniomaxillofac Surg*. 2014;42:1540-1544.
- Pogrel MA. Decompression and marsupialization as a treatment for the odontogenic keratocyst. *Oral Maxillofac Surg Clin North Am*. 2003;15(3):415-427. doi:10.1016/S1042-3699(03)00038-4
- Castro-Núñez J. Decompression of odontogenic cystic lesions: past, present, and future. *J Oral Maxillofac Surg*. 2016;74(1):104.e1-9. doi:10.1016/j.joms.2015.09.004
- Oliveros-Lopez L, Fernandez-Olavarría A, Torres-Lagares D, et al. Reduction rate by decompression as a treatment of odontogenic cysts. *Med Oral Patol Oral Cir Bucal*. 2017;22(5):e643-e650. doi:10.4317/medoral.21916
- Wang L, Ma C, Li X, et al. Comparison of wall removal type versus wall retaining type of decompression for treating large mandibular odontogenic cysts. *Oral Dis*. 2020;26(2):350-359. doi:10.1111/odi.13233
- Nahajowski M, Hnitecka S, Antoszevska-Smith J, Rumin K, Dubowik M, Sarul M. Factors influencing an eruption of teeth associated with a dentigerous cyst: a systematic review and meta-analysis. *BMC Oral Health*. 2021;23(1):180. doi:10.1186/s12903-021-01542-y
- Briki S, Elleuch W, Karray F, Abdelmoula M, Tanoubi I. Cysts and tumors of the jaws treated by marsupialization: a description of 4 clinical cases. *J Clin Exp Dent*. 2019;11(6):e565-e569. doi:10.4317/jced.55563
- Marin S, Kirnbauer B, Rugani P, Mellacher A, Payer M, Jakse N. The effectiveness of decompression as initial treatment for

- jaw cysts: a 10-year retrospective study. *Med Oral Patol Oral Cir Bucal*. 2019;24(1):e47-e52. doi:10.4317/medoral.22526
24. Qian WT, Ma ZG, Xie QY, Cai XY, Zhang Y, Yang C. Marsupialization facilitates eruption of dentigerous cyst-associated mandibular premolars in preadolescent patients. *J Oral Maxillofac Surg*. 2013;71(11):1825-1832. doi:10.1016/j.joms.2013.06.223
25. Lee ST, Kim SG, Moon SY, Oh JS, You JS, Kim JS. The effect of decompression as treatment of the cysts in the jaws: retrospective analysis. *J Korean Assoc Oral Maxillofac Surg*. 2017;43(2):83-87. doi:10.5125/jkaoms.2017.43.2.83
26. Miyawaki S, Hyomoto M, Tsubouchi J, Kirita T, Sugimura M. Eruption speed and rate of angulation change of a cyst-associated mandibular second premolar after marsupialization of a dentigerous cyst. *Am J Orthod Dentofacial Orthop*. 1999;116(5):578-584. doi:10.1016/s0889-5406(99)70192-7666666666666666
27. Fujii R, Kawakami M, Hyomoto M, Ishida J, Kirita T. Panoramic findings for predicting eruption of mandibular premolars associated with dentigerous cyst after marsupialization. *J Oral Maxillofac Surg*. 2008;66(2):272-276. doi:10.1016/j.joms.2007.06.652
28. Celebi N, Canakci GY, Sakin C, Kurt G, Alkan A. Combined orthodontic and surgical therapy for a deeply impacted third molar related with a dentigerous cyst. *J Maxillofac Oral Surg*. 2015;14(Suppl 1):93-95. doi:10.1007/s12663-012-0339-9
29. Hou R, Zhou H. Articles of marsupialization and decompression on cystic lesions of the jaws: a literature review. *J Oral Maxillofac Surg Med Pathol*. 2013;25(4):299-304.

How to cite this article: Khalifa C, Garma M, Mabrouk R, Slim A, Bouguezzi A, Selmi J. Conservative management of dentigerous cyst in children: Report of two clinical cases. *Clin Case Rep*. 2023;11:e7051. doi:10.1002/ccr3.7051