CASE STUDY ARTICLE

ROLE OF MARSUPIALIZATION IN MANAGEMENT OF PEDIATRIC ODONTOGENIC CYSTS: TWO CASE REPORTS

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RESUME

Introduction: Marsupialization is a conservative approach used for the treatment of large odontogenic cysts. In children, it aims to preserve and promote eruption of the tooth germs involved in the cystic lesion, as well as maintain the integrity of surrounding anatomical structures. **Objective:** The aim of this study was to illustrate the importance of marsupialization in the treatment of odontogenic cysts in children, through a case report of two clinical cases. **Case report:** We report the cases of two odontogenic cysts treated by marsupialization in two children consulting the pediatric odontology department of the dental consultation and treatment center in Casablanca, Morocco. The first case involved a 9-year-old boy consulting for facial asymmetry associated with a left latero-mandibular mass. The second case involved a 7-year-old girl who presented with a median maxillary bone swelling, slightly deported to the left side. Both patients presented odontogenic cysts and were treated by marsupialization. **Discussion:** Both patients showed a good clinical and radiological evolution with the resolution of the cystic lesion and the eruption of teeth involved in it. **Conclusion:** Despite the variability of therapies proposed for odontogenic cyst treatment, marsupialization remains a therapeutic option, requiring careful patient selection and long, rigorous follow-up, but offering several advantages, particularly for children.
Keywords: *odontogenic cyst, marsupialization, pediatric dentistry.*

1. INTRODUCTION

A cyst, defined as a pathological cavity containing liquid, semiliquid, or gas and not formed by pus accumulation [1], often arises from developing dental tissues in the form of odontogenic cysts, constituting approximately 90% of maxillary cysts [1,2]. These cysts can be categorized as either inflammatory or developmental. While various treatment options exist for odontogenic cysts, marsupialization emerges as a surgical technique particularly recommended for large cysts. This conservative approach is designed to not only address the cyst itself but also to preserve and encourage the eruption of tooth germs associated with the cystic lesion, while maintaining the structural integrity of surrounding anatomical features. Despite its merits, one notable drawback of marsupialization is the inherent limitation in performing a comprehensive anatomopathological examination, hindering the ability to establish a precise diagnosis of the lesion [3]. In the pursuit of advancing our understanding and clinical application of marsupialization, this study aims to underscore the significance of this technique in the treatment of odontogenic cysts in pediatric cases. To achieve this, we present and analyze two clinical cases managed within the pediatric odontology department of the dental consultation and treatment center of Casablanca. Through these cases, we aim to contribute valuable insights into the efficacy and considerations associated with marsupialization as a treatment modality for odontogenic cysts in children.

2. Case report

2.1 Case 1

A 9-year-old child in apparently good general condition presented to the pediatric odontology department of the dental consultation and treatment center of Casablanca, after the appearance of a left mandibular swelling 3 months before the consultation. On intraoral examination, a hard, painless, non-fistulized, non-fluctuating, limited vestibular tumefaction extending from 73 to 36 and associated with filling of the vestibule was observed. The two teeth bordering the swelling (36 and 74) showed deep caries. (Figure 1).

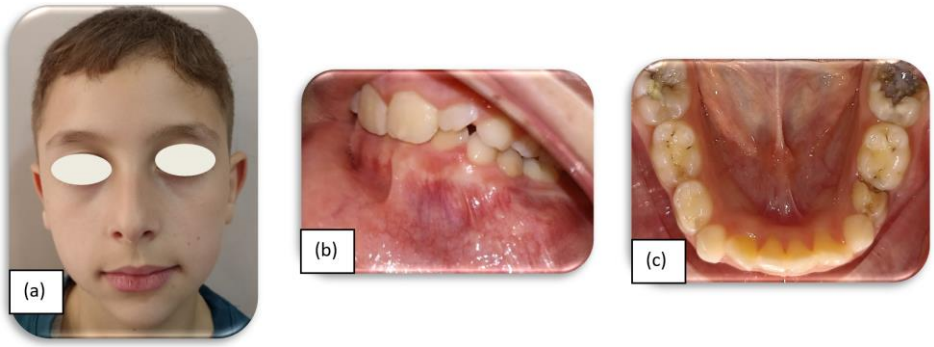


Figure 1 : Clinical examination (a) exobuccal view showing left mandibular swelling, (b)endobuccal view showing vestibular voussure,(c) Mandibular view showing caries on 36 et 74.

Panoramic radiography showed a well-limited, unilobulated radiolucency extending from 74 to 75, incorporating the germs of 34 and 35. 74 and 75 were in physiological stage III. Pathological root resorption of the distal root of 75 is evident, as are deep coronal radiolucency's on 74 and 36. (Figure 2)

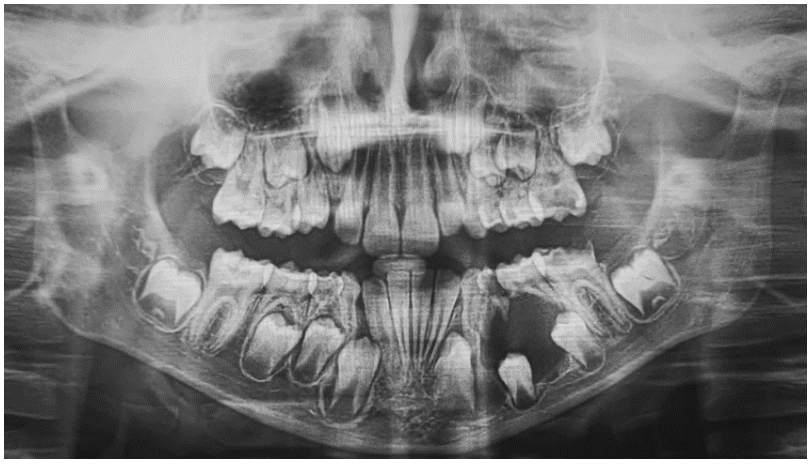


Figure 2: Radiological examination : Panoramic radiography showing the lesions' limits.

After discussion with the parents, treatment by marsupialization was chosen. After anesthesia and aspiration of a cystic fluid, 74 and 75 were extracted, a part of the cystic tissue was removed and an iodoform mesh was put in place. The mesh was changed twice a week for the first 2 weeks, and then once a week for the following 3 weeks, until lesion reossification. (Figure 3)

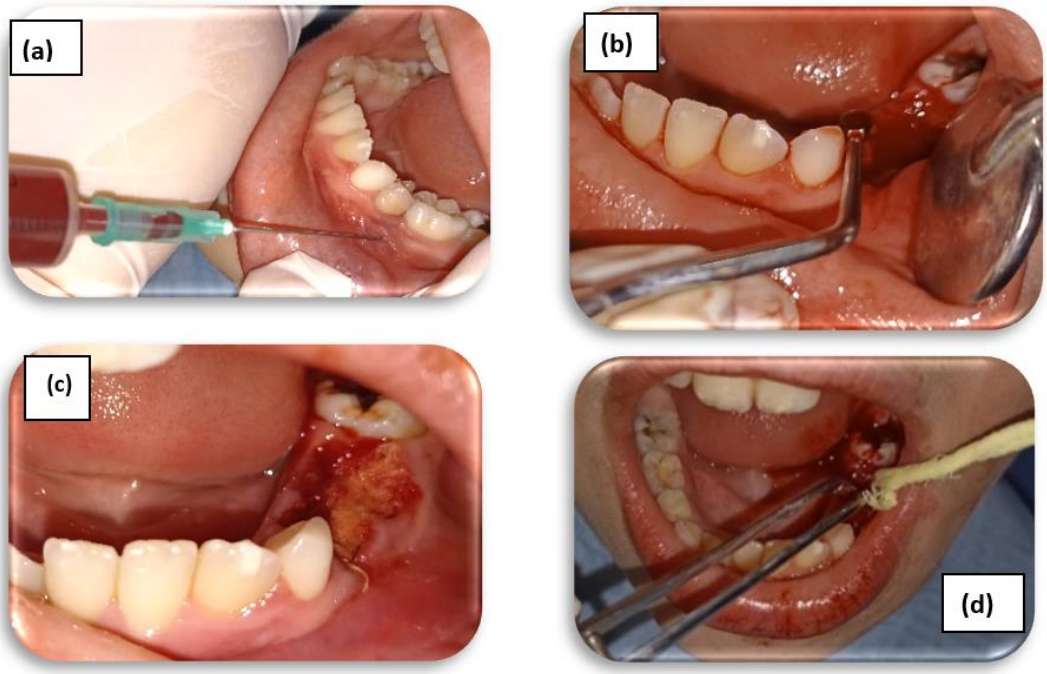


Figure 3: Marsupialization steps (a) puncture of the lesion at the most prominent point to recover cystic fluid, (b) removal of the cystic wall after extraction of 74 and 75, (c) insertion of an iodoformed mesh, (d) replacement of the mesh.

To maintain the space needed for eruption of 34 and 35, a lingual arc was placed after treatment of 36. (Figure 4) The anatomopathological examination result was in favor of a follicular cyst. After 8 months of treatment, 35 had almost completed its eruption. At one-year follow-up, the two premolars (34 and 35) had completed their eruption, and total reossification of the lesion was observed (Figure5-6).

Figure 4: The space maintainner.

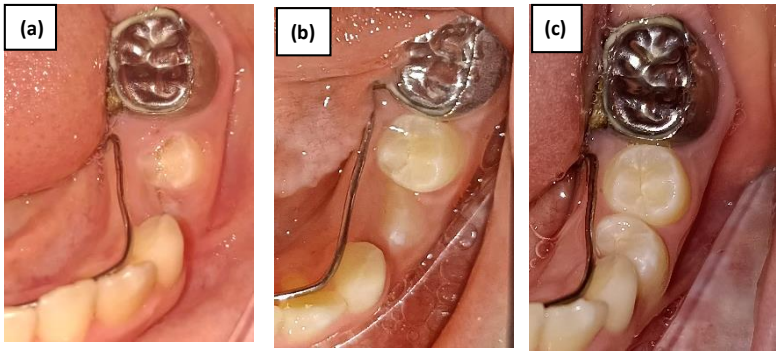
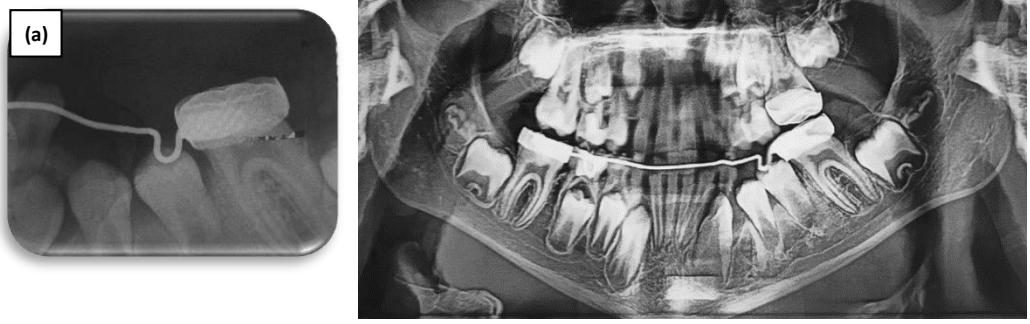


Figure 5: Clinical follow-up showing eruption of 34 and 35, (**a**)after 5 months of treatment (b) after 8 months, (**c**) one year later.

Figure 6: Radiological follow-up showing bone reossification of the lesion, (a) retroalveolar taken after 4 months of treatment (b) panoramic taken 6 months after the surgery.



2.2 Case 2

A 7-year-old female patient in apparently good general condition consulted the pediatric odontology department one month after the appearance of a maxillary tumefaction, slightly displaced toward the left side. The father had reported a notion of trauma at the age of 3.
Endo buccal examination revealed a hard, non-fistulized, non-fluctuating vestibular swelling extending from 61 to 64 and associated with filling of the vestibule. The gingival mucosa around the swollen area was normal, with no pain on palpation.61 is dyschromic and shows coronal loss of substance (Figure 7).

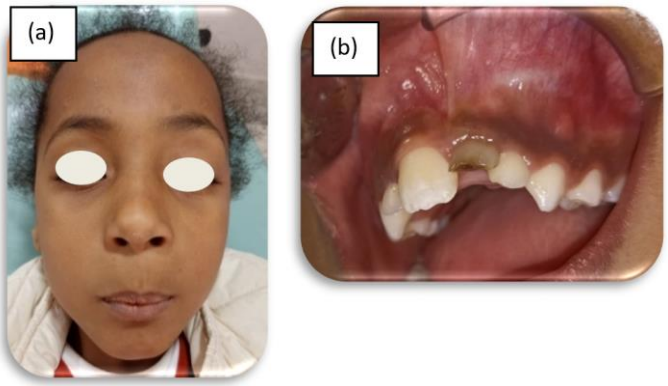


Figure 7. Clinical examination, (**a**) exobuccal view showing the upper left labial swelling, (**b**) endobuccal view showing the vestibular voussure, 61 is fractured and dyschromic.

On retro alveolar radiography, a well-limited, unilobulated radiolucent image extending from 61 to 63 was observed. It is related to the amelo-cementary junction of the germ of 22 and abuts the apex of 61 as well. 61, 62 and 63 are in physiological stage III. On panoramic radiography, a cystic-like image with blurred margins is revealed, and the 21 and 23 germs are pushed back. The cone beam shows the lesion's limits, volume, and relation with surrounding anatomical structures (Figure 8).

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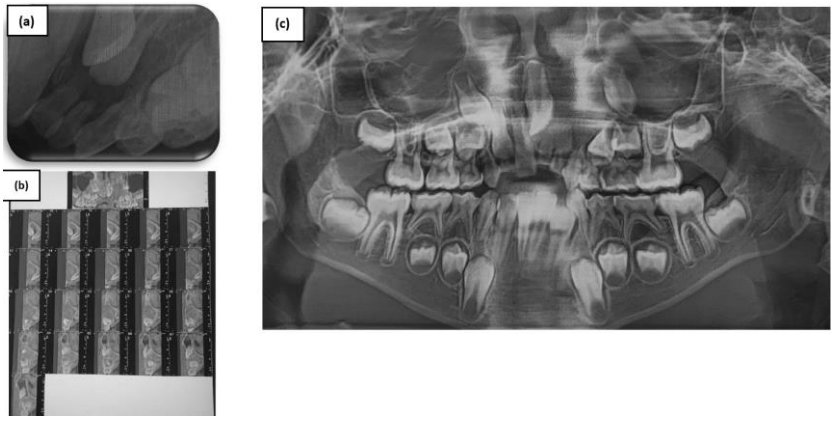

Figure 8. Radiological examination, (a) retroalveolar showing a well-limited radiolucent image, (b) cône beam exposing the limits of the lesion and the rapport with adjacent structures, (c) panoramic radiography showing the germ replacement of the 21 et 23.

Clinical and radiological findings suggested the diagnosis of an odontogenic cyst (radicular or follicular). Treatment of the lesion by marsupialization was selected, given the proximity of the lesion to the germs of adjacent teeth, and the procedure was identical to that used in the first case (Figure 9)

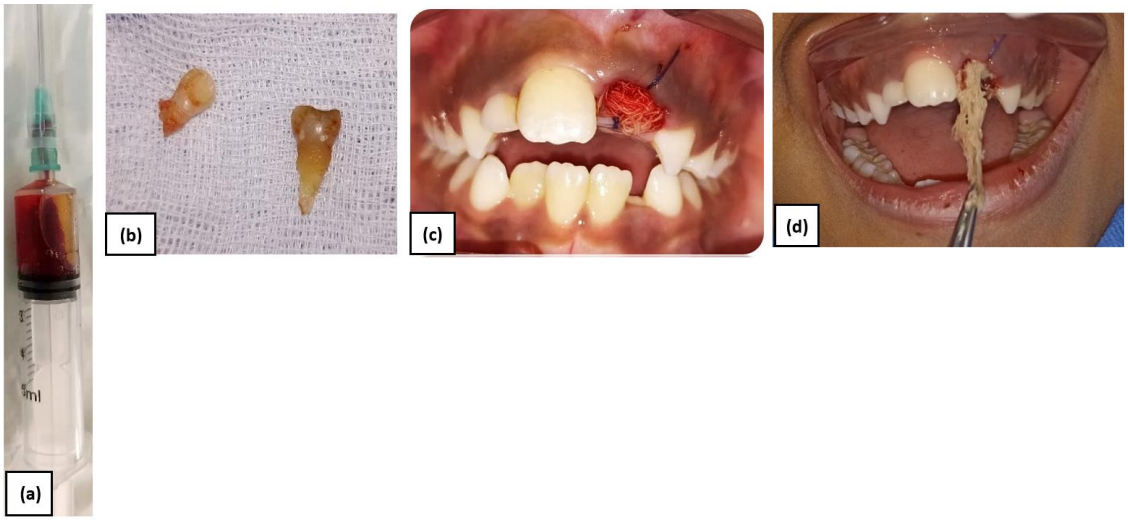

Figure 9. Marsupialization steps, (**a**) Collection of a yellowish liquid suggestive of a cystic lesion (**b**) extraction of 61, 62, (**c**) Placement of two sutures on each side of the alveolus + placement of iodoformed mesh after rinsing the cavity, (**d**) replacement of the mesh.

The result of the anatomopathological examination was inconclusive due to the minimal size of the sample obtained. A pedodontics partial denture was placed to maintain the eruption space for 21 and 22 (Figure 10).
Radiological follow-up showed reossification of the lesion six months later. 9 months after the treatment,22 had erupted in place of 21 (Figure 11-12).

Figure 10: Placement of pedodontic prosthesis.

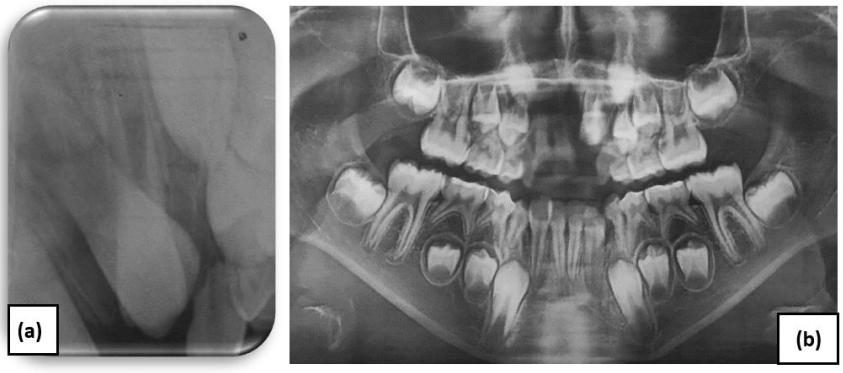

Figure 11. Radiological follow-up after 6 months showing bone reossification + disappearance of the lesion (**a**) retroalveolar radiography, (**b**) panoramic radiography.

Figure 10: Placement of pedodontic prosthesis.

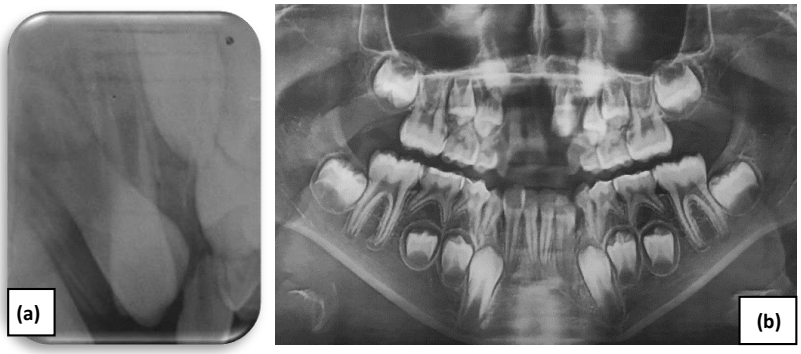

Figure 11. Radiological follow-up after 6 months showing bone reossification + disappearance of the lesion (**a**) retroalveolar radiography, (**b**) panoramic radiography.

Tooth bone palatal device was placed to allow expansion of the maxilla and create space for eruption of 21, 22 and before starting multi-attachment treatment. (Figure 13), 18 months after the surgery, we observe the eruption of both incisors (21 and 22) but superposed on each other (Figure 14).

Figure 12. Clinical follow-up, 9months after the treatment showing the eruption of 22.

Figure 13. Placement of a tooth palatal device for maxillary expansiion.

Figure 14. Eruption of 21 and 22, 18 months after the surgery.

3. DISCUSSION

Despite the clinical and radiological diversity observed in maxillary cysts, a unified approach centers around timely surgical intervention. The primary therapeutic options include cystectomy (enucleation) and cystotomy (decompression or marsupialization), with the potential for a combined approach in specific cases [4]. In the realm of pediatric practice, marsupialization emerges as the preferred treatment for sizable odontogenic cysts. Originating in 1892 through the work of PARTCh, this procedure involves creating a bony window, partially resecting the cystic sac, evacuating its contents, and maintaining an open connection to the buccal mucosa. Suturing the residual components to the mucosa prevents closure, transforming the cystic cavity into an adjunct to the buccal cavity. This arrangement facilitates permanent drainage, fostering cyst regression and bone regeneration [5,6]. Despite the efficacy of this approach, histopathological analysis through partial sampling of the cystic wall remains essential for accurate characterization [7].

The postoperative course necessitates vigilant clinical and radiological monitoring. Short-term assessments verify the cavity's patency, integrity of the retained device (iodoformed mesh), and absence of signs of infection. Mid-term evaluations track lesion evolution, cystic volume reduction, bone regeneration, and tooth placement on the dental arcade. Long-term follow-up ensures the absence of recurrences [8].

The frequency of clinical follow-up adapts to the lesion's size and patient availability. Mesh changes, typically weekly for 3 to 6 weeks, involve prior rinsing with a disinfectant or saline solution. General postoperative clinical controls occur biweekly for the initial 2 months, followed by monthly checks for a year, and subsequently every 3 years [8].

Radiological follow-up is critical for assessing post-surgical bone defects, proximity to adjacent structures, and the need for secondary enucleation. Intervals of three months for the first six months, followed by semiannual assessments until complete resolution, guide this process. Bone regeneration in the presented cases manifested after 4 and 6 months, respectively [9].

Marsupialization aims to diminish cyst volume and stimulate peripheral bone formation, preserving dental organs and their pulpal vitality. Despite its advantages, drawbacks include limited anatomopathological examination and potential recurrence risks. The prolonged process demands regular follow-up and strong patient cooperation, making it suitable for extensive cysts involving anatomical and dental structures [10,11].

The efficacy of marsupialization remains contentious. Berretta et al's systematic review leans towards its use as a preliminary treatment, often followed by secondary enucleation. Younger subjects and larger lesions exhibit more favorable outcomes [12]. Conversely, Pogrel et al advocate marsupialization as a standalone definitive treatment, with

complete resolution observed in all 10 patients over varying time frames [13,14]. Consolo et al report significant volume reduction, ranging from 48.28 to 57.95% after approximately 6 months, reaching 70.5% for dental cysts after 8 months [15]. As an alternative for pediatric odontogenic cysts, enucleation involves excising the cystic sac within defined limits, ensuring complete histological control in a single surgical procedure. While offering advantages such as histological certainty and reduced need for rigorous follow-up, it poses risks like tissue loss and potential complications (e.g., nerve damage or mandibular fractures). The comparative presentation in Table 1 delineates the features of both treatment options.

Table 1: Comparison between marsupialization and enucleation.

	Marsupialization	**Enucleation**
Removal of the cystic sac	Partial	Total
Histological examination	Partial	Total
Tissue conservation	Yes	No
Nerve injury	No	Possible
Complications	Minimal	Possible
Anesthesia type	Locoregional	Locoregional or general
Patient cooperation and follow-up	Yes	Minimal

5. CONCLUSION

Notwithstanding its drawbacks, marsupialization demonstrates efficacy in the therapeutic approach to pediatric odontogenic cysts. As a conservative technique, it upholds the integrity of essential anatomical structures and facilitates the emergence of tooth germs typically suppressed by the cystic lesion. However, prudent patient selection is imperative before recommending the procedure, necessitating a comprehensive discussion with parents regarding the nuanced advantages and disadvantages associated with the intervention.

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