

Treatment of Radicular and Dentigerous Cysts With Marsupialization: A Retrospective Study

Radiküler ve Dentigeröz Kistlerin Marsüpyalizasyon ile Tedavisi: Retrospektif Bir Çalışma

ABSTRACT

Aim: The most common odontogenic cysts of the jaws are the radicular cyst and dentigerous cyst. The treatment of cystic lesions depends on cyst's location, size and the proximity to the anatomical structure such as maxillary sinus, mandibular canal, nasal cavity. The aim of this study was to analyze clinic and radiologic features of jaw cysts that treated with marsupialization.

Material and Method: In this retrospective study, cysts in large size that were located in the maxilla and mandible were decided to treat with marsupialization in order to avoid damage to adjacent anatomical structures. Patients were followed with routine clinical and radiological examinations. Patient data and clinical-radiological features of odontogenic cysts were analyzed.

Results: 11 patients (5 females and 6 males) were included in the study. 7 of lesions in this patients were radicular cyst (63.4%) and 4 of them were dentigerous cyst (36.6%). Mandible was found to be the most affected jaw. The follow-up period varied between 8-40 months.

Conclusion: Marsupialization is an effective treatment method in the treatment of cysts in large sizes with a low complication rate.

Key words: Dentigerous cyst, Odontogenic cyst, Radicular cyst, Marsupialization.

ÖZ

Amaç: Radiküler ve dentigeröz kistler çenelerin en sık görülen odontojenik kistlerindedir. Kistlerin tedavisinde tercih edilecek yöntem; kistin boyutlarına, lokalizasyonuna ve anatomik yapılara uzaklığına bağlıdır. Bu çalışmanın amacı marsüpyalizasyon ile tedavi edilen kistlerin klinik ve radyolojik özelliklerini analiz etmektir.

Gereç ve Yöntem: Bu retrospektif çalışmada; maksilla ve mandibulada lokalize geniş boyutlardaki kistlerin, anatomik yapılara zarar vermemek amacıyla marsüpyalizasyonla tedavi edilmesine karar verildi. Hastaların takibi tam bir iyileşme sağlanana kadar devam etti. Hasta bilgileri ve kistlerin takip periyodunda karşılaşılan klinik-radyolojik özellikleri analiz edildi.

Bulgular: Bu çalışmada 11 hasta (5 kadın, 6 erkek) yer almaktadır. Tedavi edilen lezyonlardan 7'si radiküler (% 63.4), 4'ü dentigeröz (% 36.6) kisttir. Mandibula en fazla etkilenen çenedir. Takip süreleri 8-40 ay arasında değişmektedir.

Sonuç: Marsüpyalizasyon geniş boyuttaki kistlerin tedavisinde, düşük komplikasyon oranıyla etkili bir tedavi yöntemidir.

Anahtar sözcükler: Dentigeröz kist, Odontojenik kist, Radiküler kist, Marsüpyalizasyon.

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INTRODUCTION

Cyst is defined as a pathological cavity covered with epithelium. The epithelium is surrounded by fibro-collagenous connective tissue. Odontogenic cysts are originated from odontogenic epithelium which is obtained from the basal epithelium of stomodeum (1). The growth of cysts occurs slowly and infiltratively by expanding from center to the perimeter (2).

The most common odontogenic cysts of the jaws are the radicular cyst which is also called periapical cyst. These cysts constitute about 52% to 68% of all cysts affecting the jaw bones (3). Radicular cysts usually occur after trauma or dental caries. Dental caries causes the inflammation of the pulp which leads to necrosis of the pulp (4). By spreading to the root apex, infection causes periapical periodontitis that leads to acute abscess or chronic granuloma. Radicular cyst occurs as a result of permanent chronic infection (3).

Dentigerous cyst is the most common cyst after radicular cyst (5, 6). Dentigerous cysts are associated with the crown of unerupted teeth (7). It is usually observed in the third molar tooth region in association with the impacted wisdom teeth (8). If dentigerous cysts are not treated, they may cause the pathological bone fractures, bone deformation, ameloblastoma, and the development of squamous cell carcinoma or mucoepidermoid carcinoma (9).

Enucleation and curettage methods are commonly used in the treatment of odontogenic cysts (10). The treatment of cystic lesions depends on the proximity

to the anatomical structure such as cyst's location, size, maxillary sinus, mandibular canal, nasal cavity. Methods such as enucleation, curettage or resection can cause damage cyst adjacent tissues (11). Marsupialization is preferable in the treatment of odontogenic cysts in large volumes as an alternative method. By this method, the dimensions of the cyst, the pressure of which is reduced, are decreased; their alienation from the important anatomical structures is ensured (12).

In this retrospective study, we aimed to analyze clinic and radiologic features of 11 odontogenic cysts that treated with marsupialization.

MATERIAL and METHOD

This retrospective study was carried out on 11 patients who were diagnosed with radicular and dentigerous cyst and treated in Mustafa Kemal University Faculty of Dentistry between January 2012 and August 2015. Cysts in large size that were located in the maxilla and mandible were decided to treat with marsupialization in order to avoid damage to adjacent anatomical structures. Under local anesthesia, the bone on cyst wall was removed, aperture was opened and ceiling epithelium was taken. The obturator which was appropriate for the sizes of the apertures opened was prepared (Figure 1). Saline irrigation was carried out regularly to avoid accumulation of food within the cyst cavity. Patients were followed with routine clinical and radiological examinations. After the follow-up process, the treatment was concluded in patients with adequate ossification by performing final surgical procedures under local anesthesia.

Table I: Patient data and clinical-radiological features of odontogenic cysts.

Patients	Age	Gender	Cyst Type	Localization	Follow-up (months)	Complication
1	46	Male	Radicular cyst	Maxilla anterior	12	-
2	49	Male	Dentigerous cyst	Bilateral mandible ramus	18	-
3	35	Female	Radicular cyst	Maxilla anterior	14	-
4	43	Male	Dentigerous cyst	Maxilla anterior	40	-
5	54	Male	Radicular cyst	Mandible posterior	9	Fracture
6	29	Male	Radicular cyst	Maxilla anterior	16	-
7	19	Female	Radicular cyst	Mandible posterior	8	-
8	49	Female	Radicular cyst	Mandible posterior	20	-
9	34	Male	Dentigerous cyst	Mandible ramus	11	-
10	60	Female	Dentigerous cyst	Mandible ramus	12	-
11	14	Female	Radicularcyst	Mandible posterior	11	-

RESULTS

11 patients including 5 females and 6 males were included in the study. The average age of the patients is 39.2, and the age range varies between 14-60. According to histopathological examination results, 7 of lesions were radicular cyst (63.4%) and 4 of them were dentigerous cyst (36.6%) (Table I).

When the localization of the cysts was analyzed, mandible was found to be the most affected jaw (63.4%).



Figure 1: An obturator is prepared for marsupialization.

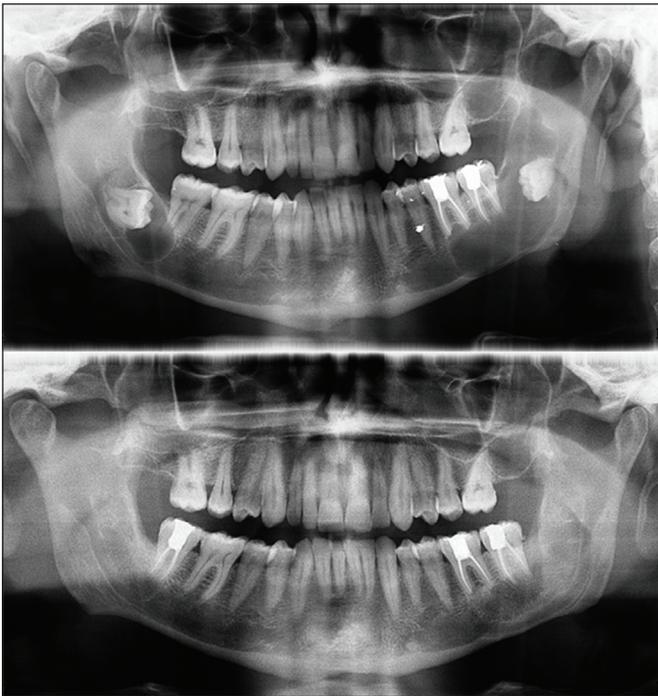


Figure 2: Bilateral dentigerous cysts and post-operative panoramic image after 18 months.

The regions where the cysts were most prevalent were listed as mandibula posterior (36.6%), maxilla anterior (36.6%) and mandible ramus (27.8%). The cysts were seen as unilateral in 10 patients and as bilateral in 1 patient (Figure 2).

The follow-up period varied between 8-40 months in patients treated with marsupialization (Figure 3), and the average follow-up period was 15.5 months. Complication was encountered only in one patient during the follow-up.

DISCUSSION

The radicular cyst occurring after trauma or caries is the most common odontogenic cyst seen in jaws. The incidence of these cysts is highest in the third and fourth decades. Maxilla is more seen in the anterior region and in males (13). In this case series, the ages of the patients with radicular cyst ranged between 14 and 54, and mandibular posterior region was affected more. In the cysts in large sizes that appear to occur due to dental caries, marsupialization treatment was administered after after the root canal therapy of the relevant tooth (3).

Koseoglu et al. (14) reported that dentigerous cyst can be seen in the 15-65 age range. It was stated in the studies that dentigerous cyst was two times more commonly seen

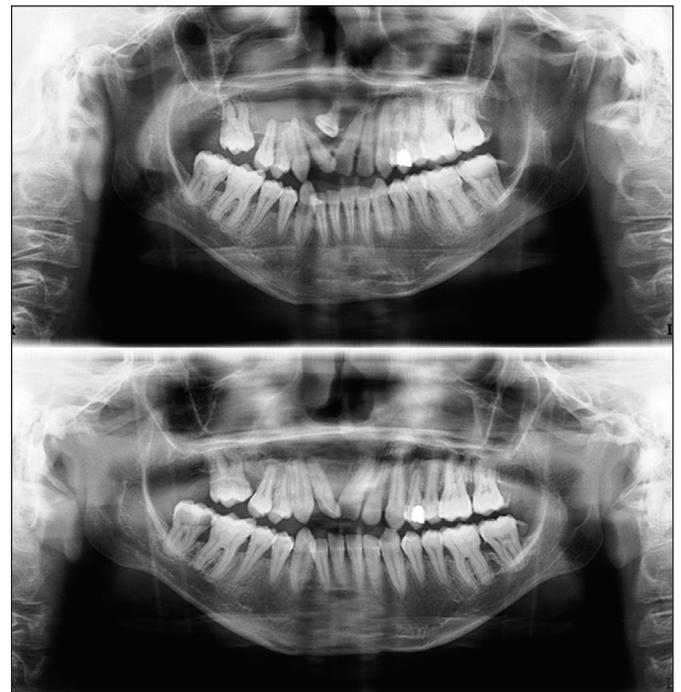


Figure 3: Dentigerous cyst in the maxilla and post-operative panoramic image after 40 months.

in men compared to women, and mandibula was more affected than maxilla (15). In the study presented, the age and sex distribution in the cases of dentigerous cyst treated was consistent with the literature. Dentigerous cysts usually affect the mandibular ramus region in association with the impacted wisdom teeth (8). In this study, while the dentigerous cyst was in association with impacted mandibular wisdom tooth in 3 patients, it was in association with maxillary lateral tooth.

The treatment of cyst with marsupialization was firstly described by Partsch towards the end of the 19th century (16). In many parts of the world, marsupialization is still defined as the Partsch I procedure. In the treatment of large cysts, a safer treatment can be applied by reducing the pressure in the cyst with marsupialization method (17). In the treatment of cysts in small sizes and without

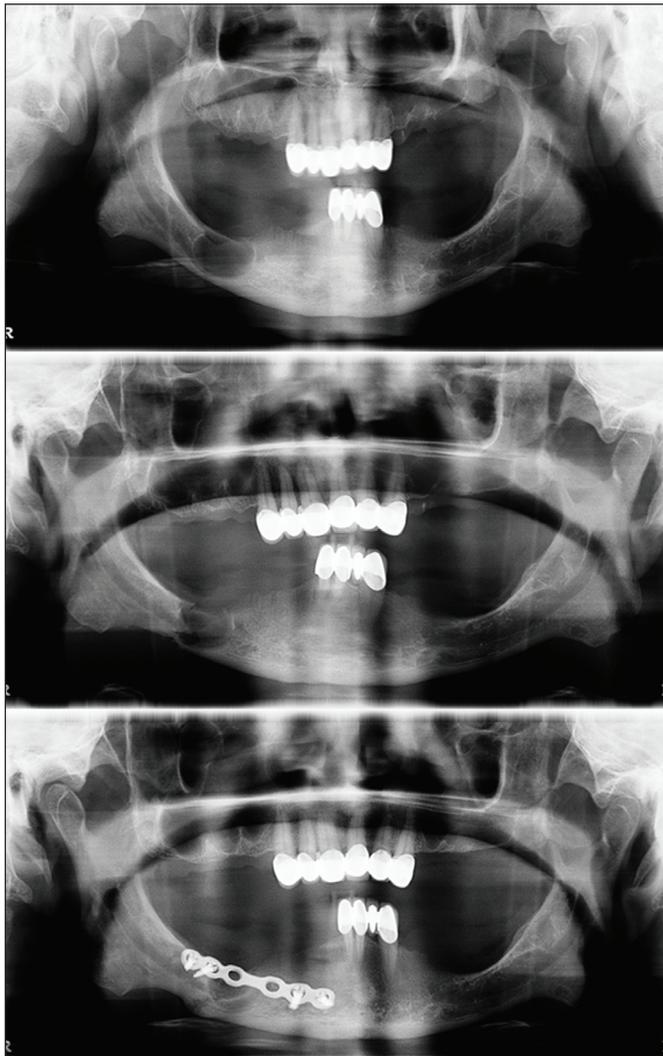


Figure 4: A fracture in the mandible associated with radicular cyst.

neighborhood with significant anatomical spaces, enucleation is preferred which is also called as Partsch II procedure in which cyst tissue is completely removed (18). Partsch I procedure was preferred in the case series presented because of the neighborhood of dentigerous and radicular cysts in large sizes with significant anatomical structures.

After operation, reducing the fracture risk, the protection of important anatomical structures such as nerves, sinuses and teeth can be listed among the advantages of marsupialization technique (19). However, we encountered with a fracture in the mandible in a patient that we performed marsupialization. The denture of the patient using removable partial denture is made obturator by adding acrylic. We noticed that fracture was occurred in the mandibular posterior region in the patient who used obturator for 1 month (Figure 4). We think that this situation occurred depending upon the arrival of more chewing forces through denture to the region where aperture was opened with marsupialization.

Marsupialization lasts longer than other surgical techniques such as enucleation. Many patients ask for the quick end of this treatment and do not accept long-term treatment (12). In our study, patients were followed for at least 8 and at most 40 months with routine clinical and radiological examinations. Marsupialization treatment should be preferred in cooperative patients to avoid any unfavorableness.

The recovery of the operation region can be assessed using various methods. Conventional radiographic techniques and computed tomography are among these methods. The radiation dose to which the patient exposed is less in panoramic radiographs compared to computerized tomography. We preferred the panoramic radiograph in patients that we routinely followed radiographically. However, in cases where limits cannot be determined exactly, we believe that a healthier assessment could be performed in the diagnosis and treatment with computed tomography in patients for whom surgical procedures will be applied such as dental implant after cyst treatment.

CONCLUSION

As a result, marsupialization is an effective treatment method in the treatment of cysts in large sizes with a low complication rate. Accurate treatment planning, regular clinical follow-up and patient cooperation are required for the clinical success.

REFERENCES

1. Rohilla M, Namdev R, Dutta S. Dentigerous cyst containing multiple impacted teeth: a rare case report. *Journal of the Indian Society of Pedodontics and Preventive Dentistry* 2011;29:244-247.
2. Asian-Gonzalez E, Pereira-Maestre M, Conde-Fernandez D, Vilchez I, Segura-Egea JJ, Gutierrez-Perez JL. Dentigerous cyst associated with a formocresol pulpotomized deciduous molar. *Journal of endodontics* 2007;33:488-492.
3. Kadam NS, Ataide Ide N, Raghava P, Fernandes M, Hede R. Management of large radicular cyst by conservative surgical approach: a case report. *Journal of clinical and diagnostic research : JCDR* 2014;8:239-241.
4. Lin LM, Huang GT, Rosenberg PA. Proliferation of epithelial cell rests, formation of apical cysts, and regression of apical cysts after periapical wound healing. *Journal of endodontics* 2007;33:908-916.
5. Akay MC, Kaya E, Zeytinoglu M. Treatment of nonsyndromic dentigerous cysts in primary dentition. *Clinical, cosmetic and investigational dentistry* 2011;3:17-23.
6. Ertem SY. 38 Vakalık Seride Çenelerdeki Kistlerin Retrospektif Olarak Değerlendirilmesi. *Atatürk Üniv. Diş Hek. Fak. Derg.* 2012; 22(2): 138-142.
7. Cho CY, Nam KY. Expansile dentigerous cyst invading the entire maxillary sinus: a case report. *J Korean Assoc Oral Maxillofac Surg* 2012; 38(4): 245-248
8. Sands T, Tocchio C. Multiple dentigerous cysts in a child. *Oral health* 1998;88:27-29.
9. Kirtaniya BC, Sachdev V, Singla A, Sharma AK. Marsupialization: a conservative approach for treating dentigerous cyst in children in the mixed dentition. *Journal of the Indian Society of Pedodontics and Preventive Dentistry* 2010;28:203-208.
10. Enislidis G, Fock N, Sulzbacher I, Ewers R. Conservative treatment of large cystic lesions of the mandible: a prospective study of the effect of decompression. *The British journal of oral & maxillofacial surgery* 2004;42:546-550.
11. Bodner L, Bar-Ziv J. Characteristics of bone formation following marsupialization of jaw cysts. *Dento maxillo facial radiology* 1998;27:166-171.
12. Martin SA. Conventional endodontic therapy of upper central incisor combined with cyst decompression: a case report. *Journal of endodontics* 2007;33:753-757.
13. Bava FA, Umar D, Bahseer B, Baroudi K. Bilateral radicular cyst in mandible: an unusual case report. *Journal of international oral health : JIOH* 2015;7:61-63.
14. Koseoglu BG, Atalay B, Erdem MA. Odontogenic cysts: a clinical study of 90 cases. *Journal of oral science* 2004;46:253-257.
15. Singh S, Singh M, Chhabra N, Nagar Y. Dentigerous cyst : a case report. *Journal of the Indian Society of Pedodontics and Preventive Dentistry* 2001;19:123-126.
16. Wakolbinger R, Beck-Mannagetta J. Long-term results after treatment of extensive odontogenic cysts of the jaws: a review. *Clinical oral investigations* 2015.
17. Sakkas N, Schoen R, Schulze D, Otten JE, Schmelzeisen R. Obturator after marsupialization of a recurrence of a radicular cyst of the mandible. *Oral surgery, oral medicine, oral pathology, oral radiology, and endodontics* 2007;103:e16-18.
18. Taşkaldıran A, Koçyiğit İD, Atıl F, Alp YE, Şenses F, Tekin U, Tüz HH. Odontojenik kist tedavisinde başarılı sonuçlarla marsupyalizasyon. *ADO Klinik Bilimler Dergisi* 2011; 4: 739-744.
19. Madras J, Lapointe H. Keratocystic odontogenic tumour: reclassification of the odontogenic keratocyst from cyst to tumour. *Texas dental journal* 2008;125:446-454.