

# The impact of COVID-19 pandemic on patient satisfaction and clinical outcomes after treatment of odontogenic cysts with decompression followed by surgery

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## SUMMARY

**Objective.** The global pandemic outbreak has caused significant limitations in the public's access to routine dental care. The aim of this study was to evaluate the patient satisfaction and clinical outcomes related to decompression treatment followed by surgery for large odontogenic cysts during COVID-19 pandemic.

**Materials and methods.** The present study were performed in patients (n=11) with large odontogenic cysts treated at our institution between March 2020 to June 2021. Decompression was applied as a part of the conservative approach and followed by surgery. All surgical procedures were performed under local anesthesia. Patient satisfaction related to treatment was recorded via the Likert scale and Visual Analog Scale after the surgery. Gender, age, location of the lesion, histopathological features, pre-and post-decompression size of lesions, decompression time, reduction rate and patients satisfaction values were recorded.

**Results.** The mean age was 27 years and all patients were male. Mean follow-up time was on average 6.45 months. Histologic examination at the time of definitive surgery was 54.5% of the radicular cyst and 45.5% of odontogenic keratocyst. The mean reduction rate was 80.8%. No recurrence were recorded. Patient satisfaction values related to treatment modality were 3.91 for the Likert scale and 79.45% for the VAS scale. 81.8% of patients recommend this treatment modality for prospective patients.

**Conclusions.** Results of this study supported that conservative management of large cystic lesions of jaws with decompression followed by surgery has favorable patient satisfaction scores and predictable to reduce the effects of radical surgery in COVID-19 pandemic.

**Keywords:** COVID-19, conservative treatment, decompression, odontogenic cyst, patient satisfaction.

## INTRODUCTION

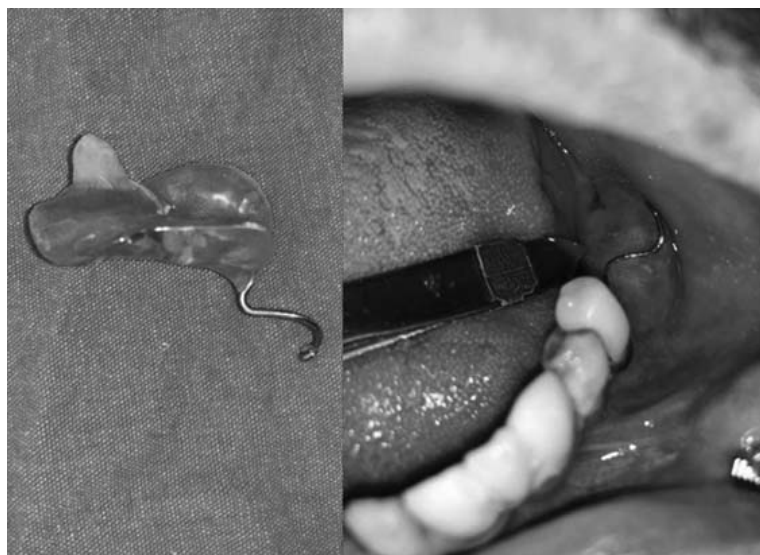
Odontogenic cysts are unique disorders that affect the oral and maxillofacial region. They originate as a result of inflammatory or developmental pathogenic causes associated with the epithelium of tooth-forming tissues (1). The most common type of odontogenic cyst is the radicular cyst followed by the dentigerous cyst and odontogenic keratocyst (1, 2). Odontogenic cysts usually result in asymptomatic, painless swellings of the jaw with a slow-growing

pattern however they can reach large volumes that could be destructive for anatomical structures. Early diagnosis of cystic lesions is important that could minimize resorption rates besides conservative treatment modalities as marsupialization/decompression can also reduce proximal tissue damage and surgical complications.

Marsupialization is the specific procedure in which cyst lining is everted and sutured to the oral mucosa to form a cavity that can remain open (3). The term decompression includes marsupialization and often has been used to describe the specific technique of inserting some type of tube, drain, or prosthesis into a cystic cavity to maintaining opening and decreasing intraluminal pressure of the cystic cavity (3, 4).

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**Fig. 1.** Obturator prosthesis

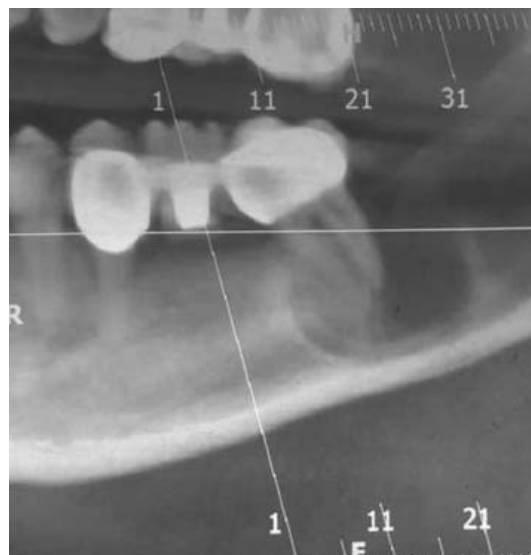
Decompression has been considered as a well-advised approach in the management of large cystic lesions. The goals for the use of the decompression technique are usually determined by the size, location, and type of the pathology encountered (5). The advantages of decompression treatment include a gradual decrease in the cystic cavity, preservation of oral tissues, maintenance of pulp vitality, prevention of extraction, avoidance of complications related to gross surgical interventions, and low recurrence rate (4). Decompression also allows surgeons to obtain a histopathological diagnosis before definitive surgery and may reduce the need for general anesthesia (2).

Several disadvantages encountered during decompression treatment are also defined as; a long follow-up period that can be extended over several months, trauma to the adjacent soft tissues from decompression tube/sutures, malposition of dislodgment of the tube. These minor complications are not life-threatening but may contribute to discomfort for the patient and clinicians (5). The decompression technique also requires adequate patient cooperation that enables irrigating of the cyst and attends follow-up visits regularly.

The present study aimed to evaluate the patient satisfaction and clinical outcomes related to decompression treatment followed by surgical intervention for large odontogenic cysts during COVID-19 pandemic.

## METHODS

Eleven patients with large odontogenic cysts were treated by decompression followed by surgery during the COVID-19 pandemic (March 2020-June 2021) at the Gulhane Faculty of Dentistry Department of Oral and Maxillofacial Surgery were included in this study.



**Fig. 2.** Preoperative radiographic image

This study was approved by Ethics Commission of the University of Health Sciences, Gulhane Training and Research Hospital with the registration number 17.12.2020-2020/484. Written consents were obtained from the patients. At the beginning of the treatment, decompression was performed simultaneously with biopsy. After obtaining a window preferably on the alveolar ridge or buccal side of the jaw, the epithelium of the cyst was sutured to the oral mucosa. To prevent closing the window, an injector, in which holes were drilled was sutured to the mucosa (6). A histopathological examination was made of the tissue samples taken from the operation site. One week after the operation, impressions were taken to fabricate an interim obturator prosthesis. The obturator prosthesis was inserted and checked for proper fit and final adjustments were performed (Figure 1). Patients were instructed to irrigate the cavity regularly until the surgical operation time. Afterward, the patients were checked at regular intervals to evaluate the shrinkage of the cyst cavity. Clinical and radiological examinations were carried out at periodic intervals until the lesion diminished in size and then surgical removal was performed under local anesthesia. Special care was taken to avoid damaging any of the proximal vital structures. Enucleation for radicular cyst, enucleation and curettage were applied for odontogenic keratocyst. Histopathological examinations were made for definitive diagnosis. Patients were monitored radiographically at routine intervals after surgery. All cases were followed up until resolution of the cyst was noted clinically and radiographically (Figure 2, 3). Gender, age, location of the lesion, histopathological features, pre-and post-decompression size of lesions, decompression time, reduction rate values were recorded. Patient satisfaction was evaluated via the Likert scale



**Fig. 3.** Post-operative panoramic image at the end of follow-up period

(0 to 5 point) and Visual Analog Scale at the end of the treatment period (7, 8).

The size of the lesion was calculated by measuring the sizes of the cysts were measured on panoramic films using Digimazer software as maximal width×height (mm). The reduction rate was measured by using (Pre-decompression size-Post-decompression size/Pre-decompression size×100). All patients completed the decompression period uneventfully. In the case of displacing the obturator, it was replaced immediately.

Statistical analysis was performed using Version 23 of IBM-SPSS for Windows (SPSS Inc, Chicago, IL, USA). The level of significance for all tests was set at  $p < 0.05$ .

## RESULTS

The patients' characteristics are presented in

Table 1. According to statistics, the mean age was 27 years (range, 20 to 57 yr.) and all patients were male. Lesions were located in the mandible in 72% (8 of 11) of patients and mostly located in the posterior region. Mean decompression time was on average 6.45 months (range 4-9 month) and was shorter for the radicular cyst. Histologic examination at the time of definitive surgery was 54.5% (6 of 11) of the radicular cyst and 45.5% (5 of 11) of odontogenic keratocyst and consistent with the initial biopsy. The mean reduction rate was 80.8%. The reduction rate of radicular cysts was higher than odontogenic keratocyst but this result was not statistically significant ( $p = 0.329$ ). No recurrence or surgical complications were recorded. Patient satisfaction values related to treatment modality as decompression followed by surgery were 3.91 for the Likert scale and 79.45% for the VAS scale. 81.8% of patients recommend this treatment modality for prospective patients. Patient

**Table 1.** Descriptions of the cases

Case	M/F	Age <sup>†</sup>	Location	Region	Cyst type	Pre-decompression size: W×H*	Decomp. time <sup>‡</sup>	Post-decompression size: W×H*	Reduction rate (%)
1	M	20	Mandible	Posterior	Radicular	30×10	5	13×6	74%
2	M	22	Mandible	Posterior	Odontogenic keratocyst	25×12	7	10×6	80%
3	M	21	Maxilla	Anterior	Radicular	20×11	4	5×7	84%
4	M	21	Mandible	Posterior	Odontogenic keratocyst	32×15	8	9×7	87%
5	M	57	Mandible	Posterior	Odontogenic keratocyst	35×12	9	20×8	62%
6	M	20	Maxilla	Anterior	Radicular	15×8	5	5×2	92%
7	M	20	Mandible	Posterior	Radicular	23×14	6	6×6	89%
8	M	52	Mandible	Posterior	Odontogenic keratocyst	30×15	8	13×10	71%
9	M	24	Maxilla	Anterior	Radicular	34×23	8	15×10	81%
10	M	22	Mandible	Posterior	Radicular	24×13	5	7×8	82%
11	M	23	Mandible	Posterior	Odontogenic keratocyst	20×12	6	5×6	87%

<sup>†</sup> Age in years.

\* Size in millimeters.

<sup>‡</sup> Decompression time in months.

satisfaction values related to treatment modality are presented in Table 2.

## DISCUSSION

Decompression as an initial treatment of cystic lesions of the jaws was a well-established technique; it reduces the lesion size avoiding possible damage to the proximal vital tissues. It has been reported that decompression of large cystic lesions could be useful for surgical interventions without complications (9). Decompression could be performed as a single surgical procedure or combined with other treatment approaches for cystic lesions in different regions of the jaws. It is effective in reducing odontogenic cysts however for aggressive lesions secondary definitive surgery is recommended (4).

At the present study, histologic examination results revealed 54.5% (6 of 11) of the radicular cyst and 45.5% (5 of 11) of odontogenic keratocyst for patients. Odontogenic keratocyst is characterized by their high recurrence rate and a definitive treatment approach for that lesions is still controversial. Marsupialization was described as an optimal treatment approach for odontogenic keratocyst that reduces recurrence rate better than enucleation and surgical resection in the light of a meta-analysis result (10). Marsupialization without followed by any other definitive cystectomy treatment has shown effective and resulted in complete resolution of the odontogenic keratocyst (11).

Another study as a meta-analysis supports the previous results as marsupialization followed by enucleation in odontogenic keratocyst can reduce the recurrence rate when compared with enucleation alone (12). Nakamura *et al.* (13) reported presurgical marsupialization was effective in odontogenic keratocyst, minimizing the cyst size and limiting the

extent of surgery without affecting the recurrence rate. In the present study, decompression was applied as a part of the conservative approach and followed by definitive surgery for odontogenic keratocyst and no recurrence was recorded.

Conservative management for aggressive benign lesions of the jaws was found predictable to reduce morbidity instead of directly performing radical surgery; besides the importance of periodic long-term follow-up is underscored (14). Zheng *et al.* (15) reported that marsupialization is an effective treatment modality with a recurrence rate that is similar to radical treatment for the treatment of unicystic ameloblastoma of the mandible on long-term follow-up. Despite the limited number of patients in our study, the results were consistent with previous studies.

It has been shown that cystic lesions of the mandible compared to the maxilla and large lesions compared to smaller have a higher reduction rate by decompression treatment (16). Location of the lesion and pre-decompression size were not found to be significantly related to the reduction rate in the present study (respectively;  $p=0.376$ ,  $p=0.334$ ).

Enislidis *et al.* (17) found an 81% shrinkage ratio for large cystic lesions of the mandible following 446 days decompression treatment. In the present study, reduction rate was calculated as 80.6% and the reduction rate of radicular cysts was higher than odontogenic keratocyst but this result was not statistically significant ( $p=0.329$ ).

It has been shown that benign odontogenic lesions may create a neurosensory disturbance (18). Recovery of inferior alveolar nerve function was remarkable in patients with large mandibular cystic lesions after decompression (19). In the present study, one patient was a complaint about neurosensory disturbance before decompression and during the decompression, disturbance diminished and recovered at the end of the follow-up period following surgery.

Patient satisfaction has a significant role in health care and it has been established as an important measure of care quality and safety (20). Patient satisfaction related to treatment is investigated in several studies for oral surgery practice including third molar surgery, orthognathic surgery, and implant insertion (21-24). Despite distinguished researches addressing clinical, histopathological

**Table 2.** Patient satisfaction values related to treatment modality

Case number	VAS Score (0-100 mm)	Likert Score (0-5) (0: not satisfied to 5: very satisfied)	Are you recommend this treatment modality to the prospective patients? (Yes/No)
1	85%	4	Y
2	91%	5	Y
3	75%	4	Y
4	82%	4	Y
5	93%	5	Y
6	67%	3	N
7	70%	3	N
8	75%	4	Y
9	90%	4	Y
10	75%	4	Y
11	71%	3	Y

Likert score:

5. Very satisfied, 4. Satisfied, 3. Neither satisfied nor dissatisfied.

outcomes of decompression treatment, this is the first study that aims to assess patient satisfaction related to decompression treatment to the best of our knowledge. Patient satisfaction values related to treatment modality were 3.91 for the Likert scale and 79.45% for the VAS scale. 81.8% of patients recommend this treatment modality for prospective patients.

## CONCLUSIONS

The pandemic period has caused restrictions on health services and a slow-down in social life in our

country as well as all over the world. Therefore, we believe that the level of patient satisfaction can be determined higher in the normal period without a pandemic. It can be concluded that decompression treatment followed by surgery for the treatment of large odontogenic cysts is a notable method in light of clinical results and patient satisfaction values during the pandemic period.

## STATEMENT OF CONFLICT OF INTEREST

The authors state no conflict of interest.

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