For Treatment of Odontogenic Keratocysts, Is Enucleation, When Compared to Decompression, a Less Complex Management Protocol?

Brian E. Kinard, DMD, [*] *Sung-Kiang Chuang, DMD, MD,* [†] *Meredith August, DMD, MD,* [‡] *and Thomas B. Dodson, DMD, MPH* [§]

Purpose: To determine whether the clinical management of odontogenic keratocysts (OKCs) is more complex in patients who undergo enucleation with or without adjuvant therapy than in patients who undergo decompression with or without residual cystectomy.

Materials and Methods: The authors implemented a retrospective cohort study and enrolled a sample composed of patients presenting for the evaluation and management of OKCs. The predictor variable was treatment group, classified as decompression with or without residual cystectomy versus enucleation with or without adjuvant therapy (Carnoy solution, cryotherapy, or peripheral ostectomy). The outcome variables were measurements of complexity of management, including total number of procedures, venue of procedure (operating room vs office), type of anesthesia, hospital admissions, and total number of follow-up visits. Data analyses were performed using univariate and bivariate statistics and a multiple linear regression model.

Results: The study sample was composed of 45 patients (66 OKC lesions) with a mean age of 43.3 years. Of the 66 OKCs treated, 34 (51.5%) were treated with decompression with or without residual cystectomy and 32 (48.5%) were treated with enucleation with or without adjunctive therapy. Larger lesions and lesions with radiographic evidence of cortical perforation were treated more often with decompression with or without residual cystectomy. Based on the multiple linear regression model, patients who underwent enucleation with or without adjuvant therapy compared with those who underwent decompression with or without residual cystectomy had on average *1)* 1.1 fewer total procedures ($P < .01$), *2)* 0.8 fewer total office procedures ($P < .01$), *3)* 0.6 fewer local anesthesia procedures ($P < .01$), and *4)* 4.8 fewer postoperative visits ($P < .01$). There was no difference in the number of general anesthesia procedures, office sedation procedures, or hospital admissions.

Conclusion: Given comparable recurrence rates, the increased complexity of managing OKCs with decompression with or without residual cystectomy might not be warranted. Enucleation with or without adjunctive therapy could be the more efficient treatment option.

J Oral Maxillofac Surg 73:641-648, 2015

[*]Resident-in-Training, Division of Oral and Maxillofacial Surgery, Department of Surgery; MD Candidate, Emory University School of Medicine, Atlanta, GA.

[†]Associate Professor, Department of Oral and Maxillofacial Surgery, Massachusetts General Hospital, Harvard School of Dental Medicine, Boston, MA.

[‡]Associate Professor, Department of Oral and Maxillofacial Surgery, Massachusetts General Hospital, Harvard School of Dental Medicine, Boston, MA.

[§]Professor and Chair, Department of Oral and Maxillofacial Surgery; Associate Dean for Hospital Affairs, University of Washington School of Dentistry, Seattle, WA.

This project was supported in part by the Massachusetts General Hospital Department of Oral and Maxillofacial Surgery Education and Research Fund (to B.E.K.), the Center for Applied Clinical Investigation (to S.-K.C. and T.B.D.), and the Massachusetts General Physicians Organization (to S.-K.C, M.A., and T.B.D.).

Conflict of Interest Disclosures: Dr. Dodson is a consultant to AAOMS. None of the other authors reported any disclosures.

Address correspondence and reprint requests to Dr Kinard: Division of Oral and Maxillofacial Surgery, Department of Surgery, Emory University School of Medicine, 1365 Clifton Road NE, Suite 2300 B, Atlanta, GA 30322; e-mail: bkinard@Emory.edu

Received October 5 2014

Accepted November 4 2014

0278-2391/14/01635-8

http://dx.doi.org/10.1016/j.joms.2014.11.001

Table 1. DESCRIPTIVE STATISTICS

Sample size	
Patients, (n)	45
Lesions, (k)	66
Demographic variables	
Age (yr)	43.3 ± 21.9
Men	26 (57.8%)
Health status variables	
ASA classification	
I	20 (44.4%)
>I	25 (55.6%)
Type of lesion (k = 66)	
Virgin	31 (47.0%)
Recurrent	35 (53.0%)
Radiograph risk factors	
Location of lesion	
Mandible	53 (80.3%)
Associated with impacted teeth	
Yes	30 (45.5%)
Largest diameter (cm)	3.1 ± 1.7
Evidence of cortical perforation	
Yes	41 (62.1%)
Locularity	
Unilocular	36 (54.5%)
Multilocular	30 (45.5)
Operative variables	
Treatment (k = 66)	
Decompression with or without residual cystectomy	34 (51.5%)
Enucleation with or without adjuvant therapy	32 (48.5%)
Management complexity variables	
Total procedures (k = 64)	2.0 ± 1.4
Venue of procedure	
OR (k = 65)	1.1 ± 0.7
Office (k = 64)	0.8 ± 1.2
Type of anesthesia	
General anesthesia in OR (k = 64)	1.1 ± 0.7
Sedation in office (k = 64)	0.2 ± 0.5
Local in office (k = 64)	0.6 ± 1.1
Hospital admissions (k = 65)	1.1 ± 0.7
Postoperative visits (k = 61)	6.8 ± 5.8

Abbreviations: ASA, American Society of Anesthesiology; OR, operating room.

Kinard et al. Management of Ontogenic Keratocysts. J Oral Maxillofac Surg 2015.

The keratocyst odontogenic tumor, also known as the odontogenic keratocyst (OKC), is noted for its locally aggressive nature and ability to recur.[1] The authors recognize the controversy regarding the current terminology for these lesions, and for simplicity and consistency, the term *odontogenic keratocyst* is used throughout this article. Multiple treatment protocols for OKCs have been reported in the literature, with recurrence rates ranging from 0 to 62%.[2-33]

Resection is reported to have a 0% recurrence rate, but at an increased morbidity for the patient.[2,12,17-19,33] Higher recurrence rates for decompression with or without residual cystectomy and enucleation with or without adjuvant therapy (Carnoy solution, cryotherapy, or peripheral ostectomy) are often tolerated for the benefit of less morbidity for the patient.[3,5,7,9,10,20-24]

The authors recently published findings showing comparable recurrence rates for decompression with or without residual cystectomy and enucleation with or without adjuvant therapy.[34] The authors began using decompression with or without residual cystectomy in the late 1990s. The initial operation (ie, decompression and stent placement) could be performed in the office or in the operating room. The operating time was short (<30 minutes) and there was minimal postoperative morbidity. However, it seemed that during the ensuing 12 months there were numerous, unscheduled, or urgent postoperative visits to manage, adjust, reinsert, or retrieve the decompression stents. Sometimes managing the stents was simple, but at other times managing the stents required a procedure using local anesthesia and reopening the wound to provide access for the stent. These are not difficult procedures but do require the patient to make an office visit, have some postoperative discomfort, and require schedule adjustments for the patient and the provider.

In contrast, most enucleations with or without adjuvant therapy were executed in the operating room and took longer than decompression and stent placement. There was more early postoperative morbidity in terms of pain and swelling. However, it was the last operation performed. In addition, there seemed to be fewer postoperative visits (eg, 4 to 6) during the first 12 months, with simpler postoperative management.

The purpose of this study was to determine whether the clinical management of OKCs is more complex in patients who undergo enucleation with or without adjuvant therapy than in those who are treated with decompression with or without residual cystectomy.

The authors tested the null hypothesis that in patients treated for OKCs, there are no differences in the management complexity of patients treated using enucleation with or without adjuvant therapy and those treated with decompression with or without residual cystectomy.

The study's specific aims were to *1)* quantify the number and type of treatment options chosen for each OKC and *2)* identify variables associated with management complexity.

Materials and Methods

STUDY DESIGN AND SAMPLE

To address research objectives, the authors designed and implemented a retrospective cohort study.