

ODONTOGENIC ABSCESS: A RETROSPECTIVE STUDY (549 CASE BETWEEN 1998-2008)**

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Abstract

Purpose: The purpose of this study was to prospectively evaluate a series of patients with severe odontogenic abscess.

Patients and Methods: In this study, we retrospectively evaluated patients with odontogenic abscess treated at the Oral and Maxillofacial Department of Dicle University during a ten-year period between 1998 and 2008. In this study 549 patients were included. Among the patients, 324 (59.0%) were males and 225 (41.0%) were females. Standardized data collection included surgical and medical treatment, complications and clinical features information. Appropriate descriptive statistics were computed.

Results: In 10 years (from 1998 to 2008) 549 patients were treated. Among the patients, 324 (59.0%) were males and 225 (41.0%) were females. Patients were treated by 67% (368) extraoral drainage and 33% (181) intraoral drainage. The most common abscess formation sites were mandibular posterior (74.8%-441 case), maxillar posterior (9.6%-53 case); maxillar anterior (8.9%-49 case) and mandibular anterior (6.5%-36 case) regions.

Conclusions: This study indicated that severe odontogenic abscess can be life threatening. Intra oral and extra oral drainage may be useful for successful treatment of extensive odontogenic infection, which can be life threatening when medical therapy is ineffective.

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Introduction

Most published cases of series of severe odontogenic abscess are retrospective (1, 2). As such, they were subjected to errors due to missing data, misclassification or misinterpretation of clinical records, and inconsistent treatment methods. Therefore, we designed a retrospective and descriptive study of 549 consecutive cases of severe odontogenic abscess, defined as those

warranting hospital admission. Standardized data were collected from each case, and uniform treatment methods were used (3-5).

The specific aims of this study were: 1) to accumulate prospective and descriptive data to characterize severe odontogenic abscess, and 2) to determine the drainage for treatment of severe odontogenic abscess. Our hypothesis was that, surgical incision and drainage combined with prompt medical treatment of all affected anatomic spaces, would result in improvement in swelling, fever, and white blood cell count (WBC) by 48 hours after surgery(6-8).

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Patients and Methods

STUDY DESIGN/SAMPLE

In this study, we used a retrospective case series design, in which all consecutive patients with odontogenic abscess, severe enough to justify hospital admission, were treated with incision and drainage and medical treatment (unless allergic) of all affected anatomic deep fascial spaces as soon

as possible during the end of treatment.

The subjects enrolled in this study were presented for care between January 1998 and January 2008 at the clinic of Oral and Maxillofacial Surgery, Faculty of Dentistry, University of Dicle in Diyarbakir.

A total of 549 subjects were enrolled in this study based on the following criteria: severe odontogenic abscess (as determined by an attending oral and maxillofacial surgeon) and hospital entrance. Informed consent was obtained by using forms and procedures developed for this institutional review board-approved study. The criteria for hospital entrance were: odontogenic abscess causing swelling in one or more of the deep fascial spaces of the head and neck, impending threat to the airway or vital structures, fever greater than 101°F, need for inpatient control of a concomitant systemic disease. Potential subjects were excluded from this study according to the following criteria: pregnancy, nonodontogenic cause (e.g. trauma-related or upper respiratory infection), and refusal of consent. Previously published nomenclature and descriptions of the deep fascial spaces were used for the purposes of this study (3, 4).

Treatment Methods

All patients were subjected to the same treatment protocol. The patient was prepared for surgery as soon as possible after hospital admission. Appropriate preoperative medical workup was performed, including history and physical examination, complete blood cell count, urinalysis, appropriate imaging studies, and medical consultation when necessary. Preoperative imaging methods included periapical and panoramic dental x-rays, as well as preoperative computed tomography (CT) scanning in selected cases. After establishment of a secure airway, the skin and mucosa were prepared with antiseptic solution. Drainage was performed for all anatomic fascial spaces that were involved by either cellulitis or abscess. Specimens for culture and sensitivity testing were harvested by either aspiration or by swab sampling of open surgical wounds (6-11). All spaces that opened were copiously irrigated and maintained using latex Penrose or Jackson-Pratt type drains (12). Postoperative CT scanning was performed when indicated based on the patient's progress and response to treatment.

All patients received medical treatment unless they gave a history of antibiotic allergy or presented with signs and symptoms of necrotizing fasciitis. Medical therapeutic failure was defined as:

1) development of an allergic or toxic reaction to the antibiotic; 2) development of necrotizing fasciitis, in which case broad-spectrum antibiotic therapy was indicated; or 3) no improvement of temperature, WBC, and swelling after 48 hours of continuous medical therapy with the same antibiotic, plus a postoperative CT scan demonstrating adequate surgical drainage of all anatomic deep fascial spaces affected by cellulitis or abscess (10, 13). If inadequate surgical drainage was shown on postoperative CT scan, then the operation was repeated, with appropriate drainage of all spaces affected by cellulitis or abscess (Figure 1).

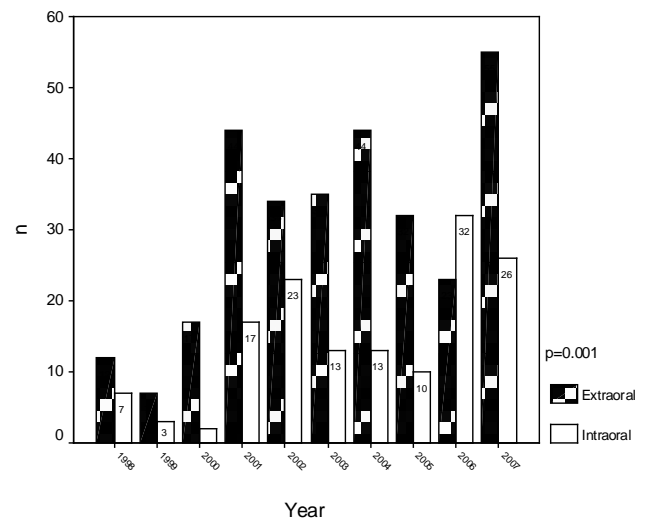


Figure 1. Distribution of the cases according to different parameter by the years.

DATA COLLECTION

The demographic variables recorded were gender. Preadmission variables were: smoking, drug allergies, preadmission antibiotic therapy, and the presence of immunocompromising diseases (such as diabetes, human immunodeficiency virus [HIV] seropositivity (14), use of immunosuppressive medications, severe kidney disease, and cancer chemotherapy within the previous year). The time-related variables included the number of preoperative days of pain, preoperative days of swelling, length of stay, operating room time, the time between admission and surgery, and season of the year. Preoperative clinical variables included causative teeth, number of teeth involved, dental diagnosis (such as caries, periodontal disease, or pericoronitis), dyspnea, dysphagia, trismus (maximum interincisal opening < 20 mm), WBC, and admission core temperature. For purposes of statistical analysis, certain variables were grouped together. For example, upper teeth were grouped into categories of anterior maxillar, posterior maxillar. Anamnestic data were obtained from the

subjects in a standardized fashion, limited to the current episode of infection, and verified by the attending surgeon.

The recorded treatment variables included the anatomic spaces drained intraoral or extraoral drainage (18). The odontogenic abscess was categorized to be originated from mandibular posterior, maxillar posterior, maxillar anterior and mandibular anterior regions.

Statistical evaluation was made with SPSS (Statistical Package for Social Sciences) 11,5 computer program. Chi square (or Fisher's exact) test used for the analyses of categorical variable and Spearman's correlation test was used for correlation between groups (Table 2).

Results

A total of 549 subjects (324 males, 225 females) were enrolled in this study. Patients were treated by 67% (368) extraoral drainage and 33% (181) intraoral drainage. The most common abscess formation sites were mandibular posterior (74.8%-441 case), maxillar posterior (9.6%-53 case); maxillar anterior (8.9%-49 case) and mandibular anterior (6.5%-36 case) regions (Table 1).

The design of this study did not include a prospective evaluation of the utility of computed tomography (CT), periapical and panoramic dental x-rays in the pre-and postoperative evaluation of severe odontogenic abscess. This may have led to misclassification of the anatomic location of infection in some cases, which is a limitation of this study. The accuracy of abscess detection in head and neck infections is improved by the combination of clinical examination and contrastenhanced CT (5, 6).

During the course of the study, however, we observed several advantages of CT.

In addition, postoperative CT was very useful in identifying correct drain placement as well as undrained loculations of pus or extension of infection during treatment. In descending necrotizing mediastinitis, Freeman et al (9) reported a reduced mortality of 0 in 10 cases, using a protocol of open thoracotomy for direct mediastinal drainage and postoperative CT taken every 48 to 72 hours in patients with the lack of clear improvement after surgery. They reported using ranges of 3 to 15 CT scans per case and 4 to 8 operations per case.

Laparotomy for extension of infection into the abdominal cavity was necessary in 30% of cases, and CT was most useful in identifying the need for laparotomy (7) Recently, CT has been used to trace the anatomic pathways of the spread

of infection arising from maxillary and mandibular teeth (7, 8)

Conclusions

The results of this study indicated that severe odontogenic abscess can be life threatening. Intraoral and extraoral drainage may be useful to successful treatment extensive odontogenic infection, which can be life threatening when medical therapy is ineffective.

Socioeconomic factors, particularly ignorance, illiteracy, and poverty, are important contributory factors towards the high incidence of odontogenic abscess in developing countries.

Parameters	Years										p
	98	99	00	01	02	03	04	05	06	07	
Gender											
Male	22	19	27	32	37	39	30	34	38	46	=0.242
Female	17	12	20	15	24	29	18	28	25	37	
Drainage technique											
Extra oral	29	23	34	34	38	45	35	42	33	55	=0.001
Intra oral	10	8	13	13	23	23	13	20	30	28	
Localization											
Maxillary Anterior	5	4	9	2	4	13	5	6	15	3	=0.244
Mandible Anterior	3	6	5	5	4	6	6	4	9	2	
Maxillary Posterior	11	4	7	5	14	7	2	7	6	5	
Mandible Posterior	20	17	26	35	39	42	35	45	33	73	

Table 1. Distribution of the cases according to different parameter by the years.

Symmetric Measures					
	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.	
Interval by Interval	Pearson's R	.665	.059	5.488	.000 ^c
Ordinal by Ordinal	Spearman Correlation	.640	.121	5.133	.000 ^c
N of Valid Cases		40			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Table 2. Year, according to the different distribution within Localization are highly correlated (r=0.640, p<0.0001).

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