

Odontogenic infections in a dental emergency care unit: Eleven-year epidemiological analysis

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Abstract

Aim: To evaluate medical records from patients who underwent abscess drainage due to odontogenic infections in a public hospital in the city of Belo Horizonte (Minas Gerais, Brazil) during the period of 2003 and 2013. **Methods:** A retrospective analysis of cases which required drainage of abscesses due to dental infections. The types of therapeutic procedures analyzed were endodontic drainage, intraoral mucosa drainage, periodontal drainage, and extraoral drainage. **Results:** 162,902 cases required dental assistance, and 32,352 cases required drainage of abscesses due to dental infections. The most frequent approach was endodontic drainage (21,313 procedures); the least frequent procedure was extraoral drainage (922 procedures). **Conclusions:** Odontogenic infection is a common clinical condition in dental clinics. It should be diagnosed and treated as quickly as possible to avoid or minimize progression to more severe cases.

Keywords: focal infection; dental; epidemiology; retrospective studies.

Introduction

Initially well-localized dental infections of low complexity are usually resolved without complications when appropriate therapy is conducted in cases where patient does not have predisposing systemic conditions. However, inefficient therapy or lack of treatment may result in progression to severe conditions, such as osteomyelitis, Ludwig's angina, airway compromise, necrotizing fasciitis, intracranial structure involvement and mediastinitis, which can be life-threatening complications^{1,2}.

Rapid and aggressive treatment of odontogenic abscesses is necessary to avoid these complications². Dental abscesses usually include secondary caries, trauma, or periodontal or endodontic infections³. Therapy can include the elimination of the causative focus, extraction, endodontic treatment, surgical drainage, and/or administration of antibiotics¹.

Received for publication: August 15, 2016

Accepted: April 19, 2017

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The objective of this study was to review and analyze the treatment of odontogenic abscesses at the Emergency Department of the Municipal Hospital Odilon Behrens (HMOB) from 2003 to 2013.

Material and methods

This retrospective study was conducted in the Dental Department of HMOB of Belo Horizonte city, MG, Brazil, and was approved by the Ethics Committee on Human of the Hospital (research number: 56442116.7.0000.5129). Records dating from 2003 to 2013 were analyzed to determine the total number of drainage procedures performed for abscesses in the maxillofacial region. The factors evaluated were the types of drainage procedures performed: endodontic, intraoral or extraoral mucosa extraoral and sulcular (periodontal abscesses). The number of cases of Ludwig's angina, which may develop in simpler cases, was recorded for comparison between cases of different complexities.

Results

Analyses of 11 years of data from the Dental Department showed that 162,902 patients were treated (average, 14,809/year). Abscess drainage was performed 32,352 times or an average of 2,941 times per year (19.85%). The most frequent surgical procedure was endodontic abscess drainage with an average of 1,937 cases per year (65.86%), followed by intraoral tissue drainage (average of 683 cases - 23.23%) and periodontal abscess drainage (average of 224 cases - 7.61%). The least frequent procedure was extraoral drainage, with an annual average of 84 cases (2.84%). These results are shown in Table 1. Ludwig's angina is a complication still less frequent, with 135 cases in 11 years (0.41%).

The hospitalization for at least one day was necessary in 388 patients (average of 35 cases per year - 1.19%). The mortality occurred in 17 cases (average 1.5 cases per year - 0.05%). These results are shown in Table 2.

Table 1 - Total number of patients from 2003 to 2013 in HMOB's Dental Department and the frequency of infections and procedures.

Year	Total patients		Total infections		Extraoral drainage		Intraoral mucosal drainage		Periodontal drainage		Endodontic drainage		Ludwig's angina	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
2003	15,126		3,211	21.23	80	2.49	602	18.74	252	7.84	2,257	70.28	20	0.62
2004	14,908		2,970	19.92	70	2.35	533	17.94	231	7.77	2,122	71.44	14	0.47
2005	14,681		2,835	19.31	74	2.61	584	20.59	288	10.15	1,876	66.17	13	0.45
2006	14,496		2,975	20.52	80	2.68	528	17.74	254	8.53	2,100	70.58	13	0.43
2007	14,568		3,349	22.98	61	1.82	679	20.27	256	7.64	2,340	69.87	13	0.38
2008	15,119		3,693	24.42	72	1.94	697	18.87	325	8.80	2,585	69.99	14	0.37
2009	16,671		3,527	21.15	65	1.84	921	26.11	296	8.39	2,231	63.25	14	0.39
2010	15,787		3,207	20.31	76	2.36	784	24.44	263	8.20	2,069	64.51	15	0.46
2011	15,329		2,500	16.30	143	5.72	637	25.48	138	5.53	1,566	62.64	16	0.64
2012	13,803		1,990	14.41	96	4.82	759	38.14	128	6.43	1,004	50.45	3	0.15
2013	12,414		2,095	16.86	105	5.01	793	37.85	33	1.57	1,163	55.51	0	0

n = number; % = percentage

Table 2 - The frequency of hospitalization and mortality of patients from 2003 to 2013 in HMOB's Dental Department.

Year	Hospitalized patients	Mortality
	n	n
2003	42	2
2004	37	1
2005	41	3
2006	39	1
2007	29	2
2008	33	1
2009	29	1
2010	42	1
2011	46	3
2012	34	2
2013	16	0

Discussion

Suppurative odontogenic infections represent an important challenge in the dental clinic because of the risk of propagation and serious potential complications⁴.

The assessment of infection involves the extent, etiology, and systemic conditions. Clinical data, images, and laboratory tests can determine if there is a localized infection or suggest the propagation of infection¹, and, based on these findings, therapeutic modalities are chosen. However, the most important procedures for orofacial suppurative infections are surgical drainage and removal of the primary source of infection⁵.

In this study, treatment procedures were divided as follows: extraoral drainage, intraoral mucosal drainage, periodontal drainage, and endodontic drainage. It is important to emphasize that the HMOB did not use tooth extraction as a protocol for pain relief. HMOB has adopted drainage for treating dental infections

and prefers the continuation of appropriate treatment. The number of cases of Ludwig's angina was cited to evaluate and compare the number of low complexity infections with that of highly complex infections without the intention to discuss local and systemic treatments for this type of infection. Well-localized infections may result in severe conditions and can be life-threatening; in 11 years, 388 patients (1.19%) required internment of at least one day and 17 patients (0.57%) died due to complications of these infections.

After analyzing the data presented, infections involving the maxillofacial region represented 19.85% of all dental emergencies in this hospital. Of these patients, 96.71% underwent some kind of intraoral drainage. Extraoral drainages, which require greater surgical experience, anatomical knowledge and result in an external scar, represented only 2.84% of cases. Furthermore, the cases diagnosed as Ludwig's angina amounted to only 0.41% of all cases observed during this period.

Comparison of the number of procedures performed revealed that treatments of low complexity infections are more common daily for a dental surgeon than the high complexity ones. This confirms the need for professional knowledge to make a diagnosis and treat low complexity infections to avoid progression to serious conditions.

Many studies have been published on the epidemiology of dental infections^{1,6-11}. However, studies on the anatomical drainage locations (local treatment) and their prevalence are few.

This study was conducted in the Dental Department of HMOB of Belo Horizonte city, MG, Brazil, which is a reference center for dental emergencies. It has full-time dentists and oral maxillofacial surgeons. It aims to serve an estimated of 4 million people in the Belo Horizonte metropolitan area.

Studies like the one conducted at Metro Health Medical Center (Cleveland, Ohio, USA), which serves 3.4 million people in Northern Ohio, showed that 86 cases of odontogenic infection were treated from 1983 to 1989⁶. Another study conducted in Well Taub General Hospital in Houston (Texas, USA) analyzed 50 cases of oral maxillofacial infection from 1987 to 1990; of these, 43 cases were of odontogenic origin¹. From 1972 to 1990, 561 patients were admitted to the maxillofacial surgery division at the University of Turin, Italy, with acute infections. In the present study, we found that 32,352 patients had dental infections, an average of 2,941 cases annually requiring some abscess drainage procedure.

Factors such as geographical location, population density, socio-economic status, and the registration period should be considered in any comparison of statistical results¹². Additionally, the oral health of the population must be considered, taking into account hygiene and access to preventive and curative dental treatment.

This study, conducted at HMOB, on the incidence and

evolution of these infections improves current understanding of dental care emergencies in a representative sample of the population of Belo Horizonte and provides data that could be helpful for developing strategies for preventing odontogenic infections.

Acknowledgements

Assistance from colleagues: Luiz Augusto Lima - Former Manager of the Emergency Department of Municipal Hospital Odilon Behrens Fernando Sartori Rocha Campos - ER Manager of the Municipal Hospital Odilon Behrens

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