Original Article

Causes of tooth extraction at a tertiary care centre in Pakistan

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Abstract

Objective: To evaluate the frequency of common causes of permanent tooth extraction and severity of dental condition at the time of tooth extraction.

Methods: The cross-sectional study was conducted at the Department of Oral and Maxillofacial Surgery, Punjab Dental Hospital, Lahore, Pakistan, from February to June 2010, and involved 1026 patients who were referred for the extraction of permanent teeth. The inclusion criteria comprised caries, periodontitis, restoration failure, trauma, and local pathologies, while 3rd Molar impactions, supernumerary tooth extraction and extractions done as part of orthodontic or prosthodontic treatment were excluded. Oral hygiene was recorded using the Simplified Oral Hygiene Index. SPSS version 17 was used for statistical analysis.

Results: The mean age of the study population was 46.60 ± 11.321 years, and there were 611 (59.6%) males. A total of 1178 teeth were extracted. Advanced dental caries was the leading cause of tooth extraction (n=743; 63.1%), followed by periodontitis (n=309; 26.2%) restoration failure (n=54; 4.6%), trauma (n=38; 3.2%) and miscellaneous local pathologies (n=34; 2.9%). More than half of the patients (n=540; 52.6%) had poor oral hygiene.

Conclusion: Advanced dental caries is the most common cause behind tooth extraction.

Keywords: Caries, Periodontitis, Restoration failure, Tooth extraction, Oral hygiene. (JPMA 62: 812; 2012)

Introduction

Tooth extraction has its own due share of pre-operative and post-operative complications.[1] Financial burden and time consumptions on the part of patients and clinical skills on the part of dentists increase to a great deal in restoring a missing tooth than maintaining a healthy dentition.

Owing to the increasing awareness through media, the paradigm of dental health profession even in developing countries has shifted in recent times towards early treatment, but it is still far from being preventive. Prevention of dental diseases on a mass scale has become the mainstay of dentistry in developed countries,[2] but this is not well organised in countries with low socio-economic status, early tooth loss is a common observation.

The nature of oral disease and its severity differs in different communities,[3] but dental decay affects every community. The severity of oral diseases at the time of presentation outlines the treatment protocol, but features responsible for the disease should be analysed thoroughly as they provide an impetus for oral healthcare awareness and preventive strategies.

The objective of this study was to evaluate the frequency of common conditions leading to tooth extraction in the local population. It also aimed at evaluating the extent of tooth destruction caused by caries in patients presenting for extraction as it is one of the most prevalent condition of tooth extraction worldwide.

The data collected through this study would help to initiate/strengthen programmes aimed at the prevention of dental diseases. Secondly, the evaluation of the severity of dental disease at the time of tooth extraction would generate meaningful policies in healthcare settings.

Patients and Methods

The cross-sectional observational study was conducted from Feb to June 2010 at the Department of Oral Surgery, Punjab Dental Hospital, Lahore, Pakistan. The study was approved by the Institutional Review Board of the hospital. Patients were informed about the nature and objectives of the study and consent was obtained before the procedure. Of the 1200 patients presenting for extraction, 1026 agreed to give their consent for participation (Response rate 85.5%). Oral hygiene was evaluated using the Simplified Oral Hygiene Index (debris index + calculus index).[4] Miller's Mobility Index[5] was used to grade the mobility of teeth. Using clinical and radiographic data,

diagnosis was made and a precise cause of extraction was established. Only one trained examiner categorised the patients to remove any bias. Single and multiple extractions were recorded separately.

For patients with caries, periapical involvement was judged by radiographic examination. Extent of caries was further categorised according to the destruction of coronal tooth structure. Periodontitis was considered to be the cause for extraction in patients having tooth mobility of grade ≥2 according to the Miller's Mobility Index. Detailed operative definition of each inclusion criteria was developed (Table-1). Extractions of deciduous teeth, supernumerary teeth, wisdom teeth, extractions done as part of orthodontic or prosthetic treatment were excluded.

SPSS-17 was used for data analysis. Percentage distribution of reasons for tooth extraction was calculated along with their respective clinical presentation. Frequency of tooth extraction in different age groups was also calculated.

Results

The mean age presentation was 46.60±11.32 years and the range 13-79 years. The highest number of patients was in the 6th decade of their lives. Among the males, 64 (10.45%) presented with good oral hygiene; 179 (29.25%) had fair; and 3689 (60.30%) had poor oral hygiene status. Amongst the female subjects, the oral hygiene status was good in 98 (23.67%); fair in 145 (35.02%) and poor in 172 (41.30%) according to the index criteria.

There were 1178 extractions carried out in 1026 subjects (1.15+0.20 teeth per patient). Of the subjects, 892 (86.93%) underwent single tooth extractions, whereas multiple extractions were carried out in 134 (13.06%) patients. Advanced dental caries was the leading cause of tooth extraction in 743 (63.1%) patients, followed by periodontitis in 309 (26.2%); restoration failure in 54

Table-1: Inclusion criteria and their operative definitions.

Inclusion criteria	Clinical presentation/operative definition
Caries resulting in the periapical pathology	Intact crown (no loss of buccal/lingual/proximal walls)
	Partially lost/Broken down crown due to caries (fracture or loss of one or two coronal walls)
	Retained roots (loss of more than two walls of coronal tooth structure)
Caries not resulting in periapical pathology	Intact crown (no loss of buccal/lingual/proximal walls)
	Partially lost/Broken down crown due to caries (fracture or loss of one or two coronal walls)
	Retained roots (loss of more than two walls of coronal tooth structure)
Periodontitis	Grade 2 or more mobility with the presence of caries
	Grade 2 or more mobility without the presence of caries
Restoration failure	Endodontic treatment failure
	Failure of coronal fillings
Trauma	Dento-alveolar trauma
Local pathologies	Odontogenic kerratocyst
	Benign odontogenic tumours

Table-2: Clinical presentation of tooth extraction according to various causes.

Causes	No. (%) of Extractions*	Clinical Presentation +	Percentage ++
Caries (periapical involvement)	618 (52.5)	Intact crown	87 (7.4)
		Partially lost/Broken down crown due to caries	383 (32.5)
		Retained roots	148 (12.56)
Caries (no periapical involvement)	125 (10.6)	Intact crown	90 (7.6)
		Partially lost/Broken down crown due to caries	35 (3.0)
		Retained roots	0 (0.0)
Periodontitis	309 (26.2)	Grade 2-3 mobility with presence of caries	134 (11.4)
		Grade 2-3 mobility without presence of caries	174 (14.8)
Restoration failure	54 (4.6)	Endodontic treatment failure	43 (3.65)
		Failure of coronal fillings	12 (1.0)
Trauma	38 (3.2)	Dento-alveolar trauma	38 (3.2)
Local pathologies	34 (2.9)	Odontogenic kerratocyst	15 (1.3)
		Benign odontogenic tumours	19 (1.6)
Total	1178 (100.0)	All causes	1178 (100.0)

*Percentage of cause of extraction calculated against total extractions (1178).
+For clinical presentation/operative definition, see Table-1.
++Percentage of clinical presentation calculated against total extractions (1178).

Table-3: Reasons for tooth extraction in each age group.

Characteristics/Diseases	Age (Years)							
	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70	71 - 80	Total †
No. of cases	72	108	144	198	216	162	126	1026
No. of Extractions	84	122	157	219	247	187	162	1178
Caries *	60	99	113	158	149	101	63	743(63.1)
Periodontitis	1	6	18	30	75	79	92	309 (26.2)
Restoration Failure	10	9	10	9	10	1	5	54 (4.6)
Trauma	6	6	13	7	4	3	0	38 (3.2)
Local Pathologies	7	4	3	6	9	3	2	34 (2.9)

*Number of extractions due to caries was the sum of caries involving periapical tissues and caries not involving periapical tissues.
† The figures in parenthesis represent percentages calculated against total number of extractions (1178).

(4.6%); trauma in 38 (3.2%) and local pathologies in 34 (2.9%) (Table-2). The predominant reason for tooth extraction in all age groups was caries (Table-3).

Discussion

The study was conducted at a tertiary care dental hospital in Lahore. The sample size is a good reflection of dental diseases prevalent amongst the general public in Pakistan. The least number of extractions was carried out in patients below 20 years of age (7%) the reason being the exclusion of deciduous teeth as well as extractions performed as part of orthodontic treatment. Orthodontic extractions have been reported in another study accounting for a substantial percentage of extractions carried out in a younger age group.[6] In the present study, percentage of tooth extractions due to caries was considerably high in younger age groups as compared to an earlier study.[7]

The current study revealed higher frequency of tooth extraction for males; an observation similar to western population sample.[8] These findings are in line with the fact that females are generally more conscious about their look and facial aesthetics and tend to seek early dental treatment.

Considerable number of studies have been conducted worldwide to evaluate reasons for dental extractions in different population groups.[6-14] Caries has been cited as the most common dental disease leading to tooth extraction in all of the afore-mentioned studies, and results from the current study conform to the previous studies. Caries was the most prevalent condition leading to tooth extraction (63.1%) in the present study. The subset of caries showing involvement of periapical tissues or otherwise gives a useful insight about the severity of the condition at the time of presentation. A higher proportion of patients (32.5%) having periapical involvement presented with loss of one or two walls of tooth crown. However, all cases of retained roots had periapical involvement.

Periodontitis was the second most common dental disease leading to tooth extraction in our study. Considerable percentage of patients (11.4%) presented with periodontitis and with the presence of caries. However, due to grade 2 mobility, periodontitis was considered to be the cause of extraction. Periodontitis was primarily diagnosed amongst patients in their fifth decade or later. These findings are also similar to many international studies which reported periodontitis as the major cause of tooth extraction in the elderly.[8-11] Amongst the extraction done for periodontal reason, 17.8% patients were younger than 50 year of age which shows a shear lack of oral health maintenance and awareness amongst our general masses.

Amongst the minor causes of tooth extraction, root canal treatment failure was reported as the main cause of restoration failure. Both subjective and iatrogenic causes can be considered a possible underlying factor, but the extent to which each might have added was not interrogated. Restoration failure was seen equally in all age groups. Dento-alveolar trauma usually leads to fracture of crown and/or root which eventually require extraction. Local pathologies such as odontogenic cysts and benign tumours developing in jaw-bones were the least frequent causes of tooth extraction.

The results obtained from the present study differ from an earlier study[12] in which tooth extractions due to periodontal disease (3.0%) were far less than what we found in our study population whereas trauma was the second most common cause of extraction (9.8%). However, caries was still reported to be the most common cause of tooth extraction (61.5%). Differences in the culture, dietary habits and oral hygiene practices might have affected the burden of disease.

Studies from many developed countries have reported significant reductions in the rate of dental caries

and the subsequent need for tooth extraction.[13-15] In Pakistan, we need to re-direct our health finances towards preventive strategies aiming at reducing the burden of diseases.

Conclusion

Dental community should reform the preventive aspects of dentistry by engaging government, media, and local organisations to carry out the awareness in school-going children and general public regarding oral health care. Strategies must be devised to organize targeted community programmes, fulfilling the needs dictated by the epidemiology of oral diseases in a certain community.

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