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Original Research

"Retention and Restoration" *versus* "Extraction and Implant:" A Questionnaire Survey among Dentists in Asir Region, Kingdom of Saudi Arabia

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Abstract:

Background: A dilemma that dental practitioners face routinely is whether to provide endodontic and restorative treatment for teeth or to extract and replace them with dental implants. This study was conducted to determine the current treatment preferences among dentists in Asir region, Kingdom of Saudi Arabia (KSA) for retention of teeth by endodontic and restorative treatment or extraction and implant placement.

Methods: 200 dentists working in Asir region, KSA were randomly selected for the study. A 14-item closed-ended questionnaire consisting of two parts was designed. The first part was to obtain general information, practicing sector (Government or Private), and specialty of the participants, and in the second part, participants were provided with clinical scenarios for both anterior as well as the posterior region.

Results: Majority (75-85%) of the participants opted for endodontic and restorative treatment for all the clinical scenarios presented.

Conclusion: Maximum participants prefer saving the natural tooth through endodontic therapy rather than opting for extraction and implant placement. The decision should be based on careful evaluation of the various factors involving the tooth and the patient.

Key Words: Dentists, endodontic restoration, implant, Saudi Arabia

Introduction

Dental implants have become an integral part of patient rehabilitation due to Branemark's concept of osseointegration. They have been used with excellent results for the replacement of missing teeth as a consequence of the high clinical success of titanium implants.[1-3] The choice of use of the dental implant in the clinical scenario depends on the decision made by the clinician in the best interest of the patient and suitable clinical condition.[1-7]

Endodontics is the time-tested treatment of choice by clinicians for restoring teeth that have been damaged by caries or trauma. Extensive evaluation of prognosis of endodontic treatment, retreatment, and surgical treatment has revealed excellent results.[7-12]

Prognostic data are solely not sufficient for any concrete recommendations as there does not appear to be a survival difference between endodontically treated tooth and implant. Therefore, there is a multitude of factors that needs consideration before reaching the final decision regarding treatment.[13,14] It is the duty of the clinician to base his treatment decision on patient satisfaction and clinical experience along with all the factors related to the tooth/teeth in question.[13-17]

Whether to treat or extract a tooth that has been affected by caries or trauma to a moderate degree, is one of the difficult decisions clinicians face in daily practice. The literature reports that the clinician's decision is based on their experience and the difficulty of the treatment involved. A multitude of factors has to be considered when making a decision regarding saving or extracting a tooth[7,12-17] thus leading the clinician in a state of dilemma. However, the therapeutic preferences on a large scale among the options need to be outlined within the populace. The factors on which treatment is based would then stand for point of analysis.

Thus, this study was performed to determine the current treatment preferences among dentists in Asir region, Kingdom of Saudi Arabia (KSA) for retention of teeth by extraction and implant placement or endodontic and restorative treatment that thereby can be a baseline to determine the factors associated.

Methods

A cross-sectional questionnaire survey was conducted among 200 dentists working in Asir region, KSA to determine the current opinion of dentists concerning the recommendation of either endodontic and restorative treatment or extraction and replacement with dental implants in various clinical scenarios presented to them. Written informed consent was obtained from the study participants. Ethical clearance

was obtained from the institutional review board of King Khalid University. A 14-item closed-ended questionnaire consisting of two parts was designed. The first part was to gather information on age, gender, year of graduation, practicing sector (Government or Private), and specialty of the participants, and in the second part, participants were provided with clinical scenarios for both anterior as well as the posterior region. For each clinical scenario, the participants were asked to select either endodontic and restorative treatment to retain the tooth (A) or tooth extraction with implant and restorative replacement (B). Selecting a included periodontal treatment, crown lengthening, posts, cores, and crowns when necessary to restore and retain the tooth, whereas B included any surgical augmentation that would be needed for implant placement as well as the prosthodontic replacement. The clinical situations for questions 1 through 12 were based on ascending levels of prosthetic and endodontic case complexities. Questions 1 through 4 were regarding treatment for single teeth, questions 5-8 regarding treatment for multiple teeth, and questions 9-12 pertaining to treatment for abutment teeth. Questions 1, 5, and 9 were regarding direct endodontic treatment, questions 3, 7, and 11 were for endodontic treatment through a crown restoration, questions 2, 6, and 10 for endodontic retreatment, and questions 4, 8, and 12 for endodontic surgical treatment. Question 13 was regarding treatment for a patient with a compromised medical history. Question 14 asked was regarding recommendation for replacement of a single missing tooth. The questionnaire was assessed for face and content validity. It was pilot tested on 20 participants and was assessed for the uniformity of interpretation. Reliability for internal consistency of the questionnaire was checked with Cronbach's alpha (0.80-1.00) during the pilot study. The responses to the questionnaires were tabulated and statistically analyzed using suitable statistical tests. Data were analyzed using Statistical Package for Social Sciences Inc., version 17.0 (IBM Statistics Inc., Chicago, USA).

Results

The study was conducted among 200 dentists with a mean age of 36.27 ± 8.64 years. There were 74.5% (n = 149) male and 25.5% (n = 51) female participants.

The distribution of study participants based on the practicing sector shows that 60.5% of the participants were working in private sector. Maximum (84.5%) of the study participants belonged to general practice. About 32.5% of the participants had the working experience of 1-5 years, and 25% of the participants had a work experience of 6-10 years. Table 1 shows the responses of the study participants to the questions. It was observed that maximum participants (75-85% for the anterior region and 70-85% for the posterior region) opted for endodontic treatment and crown restoration for all clinical scenarios presented to them. Table 2 shows the association of gender with responses using the Chi-square test. There was no statistically significant association seen between gender and responses to the questions. Table 3 displays the association of practicing sector with responses. There was statistically significant association seen between practicing sector and question number 1, 2, 8, 9, 11, and 12 with more participants opting for (A), i.e., endodontic treatment and crown restoration for the posterior region. Whereas significant association was seen between practicing sector and question number 2, 5, 7, and 10 with more participants opting for (A), i.e., endodontic

Table 1: Responses of the study participants to the questions.

Questions	Responses	*n* (%)	
		Posterior region (premolar-molar)	Anterior region (canine-canine)
1	A	173 (86.5)	171 (85.5)
	B	27 (13.0)	29 (14.5)
2	A	146 (73.0)	160 (80.0)
	B	45 (22.5)	26 (13.0)
3	A	148 (74.0)	152 (76.0)
	B	52 (26.0)	48 (24.0)
4	A	135 (67.5)	160 (80.0)
	B	65 (32.5)	40 (20.0)
5	A	168 (84.0)	179 (89.5)
	B	32 (16.0)	21 (10.5)
6	A	139 (69.5)	160 (80.0)
	B	61 (30.5)	40 (20.0)
7	A	146 (73.0)	157 (78.5)
	B	54 (27.0)	43 (21.5)
8	A	119 (59.5)	152 (76.0)
	B	81 (40.5)	48 (24.0)
9	A	163 (81.5)	170 (85.0)
	B	37 (18.5)	30 (15.0)
10	A	151 (75.5)	158 (79.0)
	B	49 (24.5)	42 (21.0)
11	A	114 (57.0)	146 (73.0)
	B	86 (43.0)	54 (27.0)
12	A	164 (82.0)	163 (81.5)
	B	36 (18.0)	37 (18.5)
13	A	145 (72.5)	152 (76.0)
	B	55 (27.5)	48 (24.0)
14	A	29 (14.5)	22 (11.0)
	B	171 (85.5)	178 (89.0)

Table 2: Association of gender with responses.

Questions	Posterior region (premolar-molar)		Anterior region (canine-canine)	
	χ^2	*P*	χ^2	*P*
1	0.177	0.674	0.413	0.520
2	6.980	0.008	0.237	0.626
3	4.507	0.034	0.447	0.504
4	1.407	0.235	0.237	0.626
5	0.138	0.710	0.035	0.851
6	2.453	0.117	3.790	0.052
7	0.664	0.415	0.646	0.422
8	2.062	0.151	1.515	0.218
9	3.638	0.056	2.317	0.128
10	0.318	0.573	0.042	0.839
11	0.460	0.498	0.079	0.778
12	1.418	0.234	2.219	0.136
13	0.001	0.993	0.083	0.773
14	0.547	0.460	0.041	0.840

treatment and crown restoration for the anterior region. Table 4 shows the association of specialty with responses. Statistically significant association was seen with specialty and answers to question number 1, 3, 4, 5, 9, and 12 with more participants opting for (A), i.e., Endodontic treatment and crown restoration for the anterior region, but this association may be due to the uneven representation of the various specialties. No significant association was seen with responses corresponding to the posterior region. Table 5 shows the relationship of position with responses. Statistically significant association was observed with specialty and responses to question number 1, 5, 9, and 11 with more participants opting for (A), i.e., endodontic treatment and crown restoration for the anterior region. Table 6 shows the association of years of experience with responses. No association was observed between years of experience and the responses to the questions.

Discussion

The present study was conducted to determine the treatment preferences of dentists in Asir region, KSA, for various clinical scenarios either by root canal therapy and restorative treatment or extraction and implant placement.

An extensive search of the literature revealed only one study that reported the treatment preferences by dentists. The participants more frequently selected endodontic and restoration over extraction and implant placement for all the clinical scenarios presented to them. This was in accordance with a study conducted by Di Fiore *et al.*,[7] in New York. However, there was no association found between the responses and any of the factors such as gender, years of experience, practicing sector, and specialty which was in contrast with the findings of Di Fiore *et al.*,[7] who reported that dental students preferred implants more than dental faculty, and the newer graduates on the dental faculty opted for implants more than more experienced dentists that may be due to the fact that implants are a relatively recent inclusion in the dental curriculum.

In our study, there seems no difference in the choice of treatment with patients' systemic health or based on the position of the

Table 3: Association of practicing sector with responses.

Questions	Posterior region (premolar-molar)		Anterior region (canine-canine)	
	χ^2	*P*	χ^2	*P*
1	5.750	0.016	0.035	0.852
2	3.016	0.082	0.084	0.772
3	0.032	0.859	0.000	0.989
4	3.072	0.080	2.307	0.129
5	1.758	0.185	0.019	0.889
6	6.468	0.011	0.424	0.515
7	0.576	0.448	0.00	0.996
8	0.086	0.769	1.872	0.171
9	0.362	0.547	0.004	0.952
10	0.306	0.580	1.106	0.293
11	0.080	0.777	3.413	0.065
12	1.470	0.225	1.813	0.178
13	0.055	0.814	0.106	0.745
14	7.032	0.008	2.910	0.088

Table 4: Association of specialty with responses.

Questions	Posterior region (premolar-molar)		Anterior region (canine-canine)	
	χ^2	*P*	χ^2	*P*
1	12.828	0.076	25.836	0.001
2	10.412	0.166	10.206	0.177
3	9.398	0.226	12.940	0.074
4	6.068	0.532	18.539	0.010
5	15.647	0.029	31.041	0.001
6	8.140	0.320	10.141	0.181
7	12.089	0.098	12.987	0.073
8	6.711	0.460	13.301	0.065
9	13.201	0.067	27.608	0.000
10	19.609	0.006	13.105	0.070
11	5.068	0.652	15.471	0.030
12	18.801	0.009	15.617	0.029
13	9.302	0.232	8.808	0.267
14	4.019	0.778	6.113	0.527

Table 5: Association of position with responses.

Questions	Posterior region (premolar-molar)		Anterior region (canine-canine)	
	χ^2	*P*	χ^2	*P*
1	15.601	0.001	19.813	0.000
2	2.039	0.564	4.708	0.195
3	3.962	0.266	5.071	0.167
4	0.035	0.998	9.619	0.022
5	6.342	0.096	14.824	0.002
6	2.885	0.410	4.708	0.195
7	0.553	0.907	1.453	0.693
8	2.238	0.525	7.710	0.052
9	3.050	0.384	7.252	0.064
10	1.058	0.787	4.624	0.202
11	1.599	0.660	11.883	0.008
12	12.503	0.006	12.213	0.007
13	1.889	0.596	6.037	0.110
14	5.135	0.162	8.483	0.037

Table 6: Association of years of experience with responses.

Questions	Posterior region (premolar-molar)		Anterior region (canine-canine)	
	χ^2	*P*	χ^2	*P*
1	18.078	0.003	15.512	0.008
2	10.008	0.075	8.312	0.140
3	5.203	0.392	3.704	0.593
4	12.346	0.030	16.578	0.005
5	15.502	0.008	4.908	0.427
6	4.452	0.486	1.743	0.883
7	3.362	0.644	5.608	0.346
8	16.334	0.006	8.538	0.129
9	8.137	0.149	3.266	0.659
10	12.653	0.027	6.525	0.258
11	23.597	0.000	16.893	0.005
12	7.742	0.171	8.678	0.123
13	14.096	0.015	9.885	0.079
14	9.778	0.082	5.939	0.312

tooth in the arch. This finding was in disagreement with that of Di Fiore *et al*.,[7] who reported that the position of the tooth in the dental arch and a compromised medical history were factors that influenced the treatment selection.

Implants have become the treatment of choice, the treatment of edentulism in clinical scenarios in recent times. The literature reports the outstanding success of implant dentistry owing to better materials and extensive research on biologic determinants. Though technique sensitive, when placed in an ideal situation, implants can achieve long-term functional performance with a success rate of more than 95%.[16,18-21]

With the rise in the success and popularity of implants, some clinicians propagate that implants are as good as if not better than natural teeth in certain situations. However, it is important to understand that maintenance of function and acceptable esthetics of the natural dentition should be the primary goal of any clinician. The physical, biomechanical, and sensorial properties of natural teeth cannot be replicated completely by prosthetic restorations. When a tooth is compromised by periodontal disease, pulpal pathology, trauma, or caries, extraction and placement of an implant are not always feasible. Therefore, an increasingly frequent dilemma clinicians face is whether to resort to endodontic therapy or extraction and implant placement.[16,22] The careful evaluation of factors that affect the clinician's decision about whether to restore or extract a diseased tooth is of utmost importance for the success of treatment and patient satisfaction.[13,16]

Avila *et al*.,[16] in their review presented with a six stage color-based decision-making chart, which includes several factors, based on available scientific literature when they are deciding whether to save or extract a compromised tooth. They have included a variety of factors such as initial assessment, furcation involvement, periodontal disease severity, restorative factors, etiologic and treatment factors, and other determinants such as smoking, stress, uncontrolled systemic condition, and the clinical experience to their decision-making model. Here, are some other factors that need to be considered in the decision-making process:[17-26]

- Financial consideration and a number of adjunctive procedures. Implant and crown are usually more expensive when compared to endodontic treatment and restoration[17]
- Esthetic considerations[17,26]
- Biologic considerations. Extraction and implant placement are beneficial for patients with recurring caries, periodontal disease, etc.[17]
- Systemic factors. Certain systemic factors, such as diabetes and smoking, negatively influence the survival of dental implants and may indicate the restoration of a natural tooth through root canal treatment[27,28]
- Anatomic factors. Factors such as poor bone quality and quantity and proximity to vital structures may lead to difficulty in implant placement, therefore making such teeth candidate for the endodontic procedure[16,17]
- Tooth color and tooth thickness. The tooth color and factors influencing can make it tough for the clinician to perform color matching. This can lead to difficulty in both endodontic crown and implant restoration[16,17]
- Patient preference. Patient preference is of utmost importance in clinical decision-making. The clinician should individually evaluate the tooth and patient for esthetics, function, comfort, and cost-effectiveness to provide the best treatment for the patient. The clinician should provide the patient with all the available treatment option with their pros and cons so as to achieve maximum patient satisfaction.[29]

Conclusion

To extract or not to extract is an important question that arises in a clinician's daily practice. In the present study, maximum participants prefer saving the natural tooth through endodontic therapy rather than opting for extraction and implant placement. The decision should be based on careful evaluation of the various factors involving the tooth and the patient. This study provides a baseline to identify factors supporting the results and correlate the same to existing guidelines for effective evidence-based practice.

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