

Clinical Update

Five-Year Retrospective Assay of Implant Treatments and Complications in Private Practice: Restorative Treatment Profiles of Single and Short-Span Implant-Supported Fixed Prosthesis.

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INTRODUCTION

The replacement of missing teeth with osseointegrated implant fixtures has become commonplace in modern dental practice. Implant treatment can be used to replace single missing teeth, short span edentulous areas or larger complex edentulous regions.

Much literature exists relating to both the surgical and prosthetic aspects of implant treatments. Such prosthetic treatment can have many variables including the method of restoration retention (cement-retained, direct-to-fixture, cross-pin), prosthesis materials, abutment systems and interim restorations. Such research that does exist relating to implant restorations is largely centred around teaching institutions rather than private practice. This report is from a project involving implant placement and restoration in private practice settings in Victoria. It aims to describe the clinicians, patients and restoration variables involved in a cohort of single implant-supported crowns and other similar short-span prostheses.

MATERIALS AND METHODS

This study was conducted through the eviDent foundation, a dental practice based research network which is an initiative of the Australian Dental Association Victorian Branch (ADAVB). A retrospective analysis was undertaken of patients receiving implant treatments in private practices between 1 January 2005 and 31 December 2009. Dentists were able to be included in the study if they graduated in or before December 2004 and were placing or restoring implants in private practice during the study period. Clinicians were recruited for the study via the ADAVB newsletter or by approaches from the research team. Information from the study was gathered directly from the records of enrolled dental practitioners as well as from their referral correspondence with other clinicians (referred clinicians).

The study was restricted to single unit implant-retained crowns or similar short span prostheses of no greater than three units. Data that were collected relevant to this study included:

- Clinician demographics
- Patient demographics
- Use of interim restorations
- Prosthesis design (e.g., single tooth, single-unit cantilever, three-unit fixed partial denture (FPD))
- Restoration and abutment details

An interim restoration was defined as any non-implant supported provisional restoration (e.g., removable partial denture).

RESULTS

Practitioners enrolled in this study consisted of 25 general dentists and 9 specialists including oral surgeons, periodontists and prosthodontists. Within the population of enrolled clinicians, most (82%) of the prostheses were prescribed by clinicians who graduated between 1970 and 1989. This translated into between 16 and 40 years of clinical experience.

A total of 5491 implant prostheses were provided during the study period and met the definition of simple restorations (single-unit or short-span). This number results from a pooling of data from both enrolled and referred clinicians (those having correspondence with enrolled clinicians). A large percentage of these prostheses represented single-tooth restorations as can be seen in the table below.

Metal-ceramic (PFM) was the material of choice for the majority of restorations. A far smaller number of restorations were fabricated out of ceramic but this was almost always for single tooth restorations. A large number (37.8%) also had no restorative material recorded.

Prostheses retained via screws, cross pins and cement were all recorded in this study. Screw retained was most often used, making up 65.9% of those restorations where the retention method was recorded. Retention with cross pins (16.3%) or by cementation (17.8%) were significantly less common. Interestingly, specialist clinicians were more likely to have used screw retained prostheses (82% of the time) when compared with general dentists (48%). General dentists used cementation 35% of the time compared with just 3% for the specialists.

Implant prostheses placed in the anterior mandible were uncommon in this study accounting for just 43 cases. Placement in the anterior maxilla, posterior maxilla and posterior mandible were all common. Men were significantly less likely to have posterior restorations placed but showed a similar frequency to

	Total	Clinician		Restoration material			
		GP dentist	Specialist	PFM	Ceramic	Gold	NR
Single tooth	4760	1777	2983	2771	185	4	1800
Single implant cantilever	175	98	77	151	0	0	24
Two unit splinted crowns	181	69	112	162	2	0	17
Three unit implant FPD	343	102	241	270	1	0	72
Three unit splinted crowns	24	8	16	20	0	0	4
Tooth-implant combination	8	2	6	8	0	0	0
Total	5491	2056	3435	3382	188	4	1917

women for placement in the anterior maxilla.

In around 40% of cases, an interim restoration was used before placement of the definitive implant prosthesis. This figure was higher in the anterior maxilla (67.6%). A removable partial denture was most commonly employed but vacuum formed Essix retainers, resin-bonded partial dentures and orthodontic retainers were also used. Implant-supported provisional restorations were also recorded but were significantly less common, making up around 5.5% of cases.

Female patients were recorded in greater numbers throughout most age and restoration groups in this study; 73.2% of patients included were born between 1940 and 1969, making them between 41 and 70 years of age at the time of the study.

DISCUSSION

The implant prostheses involved in this cohort during the study period aim to provide a snapshot of overall implant prosthodontic treatments in the state of Victoria. Although general and specialist practitioners were involved, the authors acknowledge some bias exists as a result of the voluntary nature of clinician participation.

Single-unit implant prostheses were the most common restoration seen within the parameters of this study, making up 86.7% of restorations. Other short-span prosthesis designs were seen in much smaller numbers including splinted crowns, cantilever designs and fixed partial dentures. Just eight tooth-implant combination prostheses were recorded. This latter type of prosthesis has been somewhat controversial due to concerns regarding complication rates.

The predominance of metal-ceramic (PFM) restorations in this study was unsurprising. All-ceramic restorations were used largely in the anterior maxilla and represented less than 15% of cases recorded. This finding reflects broad concerns in the literature regarding the long-term clinical survival of all-ceramic implant prostheses.

The amount of information reported regarding abutments in this study was limited. Due to the retrospective nature of this study, data could only be collected regarding abutments if the clinician

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Questions

- This study design was:**
 - A prospective study of patients from university teaching clinics
 - A prospective study of patients from private practices
 - A retrospective study of patients from university teaching clinics
 - A retrospective study of patients from private practices
- Which of the following clinicians would not have been eligible to participate in this study?**
 - A dental specialist graduating in 2003
 - A general dentist graduating in 2006
 - A general dentist from rural Victoria
 - A prosthodontist from metropolitan Melbourne
- TRUE or FALSE?**
Short-span implant prostheses were included in this study up to a maximum of four units in length.
- Which of the following was the most commonly used interim restoration?**
 - Essix retainer
 - Removable partial denture
 - Orthodontic retainer
 - Resin bonded partial denture
- Which of the following statements is true?**
 - Most of the prostheses recorded were prescribed by clinicians with less than 16 years of experience
 - Most of the prostheses recorded were prescribed by dentists graduating after 1989
 - Most of the prostheses recorded were prescribed by dentists graduating before 1970
 - Most of the prostheses recorded were prescribed by clinicians with more than 16 years of experience
- How many three-unit fixed partial dentures were recorded as having been completed by general dentists?**
 - 69
 - 102
 - 241
 - 343
- How many implant prostheses had a method of retention recorded other than being screw retained?**
 - 65.9%
 - 37.8%
 - 34.1%
 - 17.8%
- How many prosthesis designs utilised just one implant fixture for support?**
 - 4760
 - 4935
 - 5116
 - 5491
- TRUE or FALSE?**
Women were significantly more likely to have an implant prosthesis placed in a posterior area compared with men.
- Which of the following statements is not true?**
 - Interim restorations were placed more commonly in the anterior maxilla
 - Interim restorations were placed in approximately 40% of cases
 - Interim restorations were defined as those that were implant supported
 - Resin bonded partial dentures were considered interim restorations

Clinical Update Review – DECEMBER 2016

Completion and return of this questionnaire with 9 correct answers will gain 1 scientific CPD hour towards satisfying Dental Board of Australia requirements. This is an ADAVB members only service. An administration fee of \$11 (GST inclusive) applies. Circle the correct response on this form (or a photocopy) and return it with payment to: CPD Coordinator, ADAVB, PO Box 9015, South Yarra, Victoria 3141 - Submit by 30 December.

Or submit your answers online AT NO COST at www.adavb.net

1. ABCD 2. ABCD 3. T/F 4. ABCD 5. ABCD

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Answers to last issue's Clinical Update (November 2016)

1 D, 2 A, 3 C, 4 FALSE, 5 D, 6 C, 7 C, 8 TRUE, 9 A, 10 B

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