

Surgical placement of implants – experiences, practices and opinions of South African prosthodontists

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G Geerts¹, S Naidoo²

Correspondence author

Prof Greta Geerts: Department of Restorative Dentistry, Faculty of Dentistry, University of the Western Cape, Private Bag XI, Tygerberg,

7505. Tel: 021 937 3133; Fax: 021 931 2287; E-mail: ggeerts@uwc.ac.za.

ABSTRACT

It is generally accepted that dental implant-treatment is “restorative” driven: the virtual blueprint of a prosthesis determines the position and number of implants to be placed. Competent interdisciplinary team-work is essential for the successful completion of implant-retained restorations. The purpose of this survey was to determine the experiences, practices and opinions in terms of the surgical placement of implants among South African prosthodontists.

A questionnaire was e-mailed to a sample of South African prosthodontists. Data were collated and analysed using EpiInfo. Statistical significance was set at 0.05 and strength of association was determined by means of measurement of relative risk (RR) and chi-squared test or Fisher’s exact test.

The response rate was 49%. The majority of respondents were male. Mean age was 50 years and all treated patients with implant-supported prosthesis. Most implants were placed by non-prosthodontists (surgeons/periodontists) and the majority of prosthodontists reported that they were generally satisfied with implant placement by other specialities. Six prosthodontists reported that they surgically place implants themselves. Of those not placing implants, five reported that they would like to do so. Younger prosthodontists, those who had attended short courses and those who considered their “surgical training” to be adequate, were more likely to place implants themselves or to want to do so.

This survey identified areas for further research into the dynamics that may cause changing habits in the management of implants in prosthodontic practices, and carries the implication that the scope of practice of the different specialities should be continuously evaluated and adapted, to the ultimate benefit of the patient.

Dental implants; scope of prosthodontic speciality; survey questionnaire

The initial protocol for implant placement and subsequent restoration was developed and described by Brånemark and co-workers at the University of Göteborg, Sweden.¹

Since they were a team of surgeons, this protocol had a strong surgical emphasis. However, it soon became clear that for optimal tooth replacement, a restorative-driven treatment plan was required, as the virtual blueprint of a prosthesis determines the number and position of implants to be placed.^{2,3} If the treatment plan is not completed and delivered by a single clinician, competent interdisciplinary team-work is essential, and an appreciation of the potential limitations of each aspect and phase of the treatment protocol is required from each team member.

High success rates have been obtained and reported with most major dental implant systems.⁴ Implant dentistry has become an established component of undergraduate and postgraduate curricula at dental schools here and internationally.^{5,6,10} It has been shown that exposure to implant dentistry in dental schools resulted in more frequent implant placement in general practice and in more patients receiving implants.¹¹ An abundance of information made available through continued professional education by tertiary institutions, product training by companies, and through the internet, continuously push the frontiers for practitioners.

General dental practitioners are permitted to place and to restore implants. However, for South African dental specialists, the scope of practice is restricted to the type of procedures usually associated with their speciality, essentially dating back to the pre-implantology era: “Prosthodontists do not place implants and surgeons do not restore them”. Although interdisciplinary communication is encouraged, dental education in South African postgraduate programmes continues to follow this philosophy.⁷ The question then arises: in view of the rapidly changing practice and social environments, should traditional boundaries be respected or should specialities explore their horizons and establish new interdisciplinary relationships? Sadowsky (2010) reported an increasing dependence of “surgical prosthodontists” on oral surgeons to manage the more complex and high-risk cases.¹² He writes: “... new interdisciplinary relationships have been forged between the specialists, potentiating a more sophisticated dialogue on treatment planning, incentivising advancement of proficiencies, and generating more referrals.”

In the USA in 1992, an increase in the length of time for prosthodontic speciality training was implemented, following

Questionnaire no.

Name (optional)

When and where did you qualify as a prosthodontist?

1. Age _____ Years 2. Gender _____ Male _____ Female

3. How long have you been practising as a prosthodontist?

4a. Where do you practise?

4b. How many days per week?

4c. How long in this practice (years)

5a. What percentage of your practice is devoted to?

Partially dentate patients

Edentulous patients

Maxillofacial prosthodontics

5b. What percentage of the partially dentate patients are treated by?

Conventional removable prosthodontics

Implant-supported prosthodontics

Other, please explain:

5c. What percentage of the edentulous patients are treated by?

Conventional removable prosthodontics

Implant-supported removable prosthodontics

Implant-supported fixed prosthodontics

Implant-supported fixed-removable prosthodontics

Other, please explain:

6. What percentage of your patients receive at least one implant-supported restoration (of any type)

None

1-25%

26-50%

51-75%

76-100%

7. Is your implant practice ...

Growing

Stable

Shrinking

8. Do you place implant-supported restorations in your practice?

Y

N

9. Do you surgically place implants in your practice?

Y

N

10. Has the number of implant referrals from outside your practice decreased since you began surgically placing implants?

Y

N

11. How many implant-supported prosthesis did you deliver in the past 6 months?
- None
1-30
31-60
61-90
>90
12. Are the results of implants placed by others acceptable?
- 12a. If no, why not? Y N
13. How many patients did you refer for implant placement in the past 6 months?
- None
1-20
21-40
41-60
>60
14. The surgeon(s) placing implants for your patients practises in ...
- The same building
The same street
The same town
A neighbouring town
15. If you restore implants placed by others, are you generally satisfied with the implant placement?
- 15a. If not satisfied, why not, please explain Yes No Do not restore implants placed by others
16. Do you get referrals following complications or failed implant placements by other practitioners? Yes No Do not treat patients with implants placed by others
17. To whom do you most often refer for surgical placement of implants?
- Another prosthodontist
A periodontist
An oral surgeon
A general dental practitioner
Other (please specify):
18. What percentage of patients that you see for implant-supported restorations were referred to you by oral surgeons?
- None
1-25%
26-50%
51-75%
76-100%
19. What percentage of patients that you see for implant-supported restorations were referred to you by periodontists?
- None
1-25%
26-50%
51-75%
76-100%

20. Would you like to place your own implants? Yes No Don't know
21. How long have you been placing implants?
0-1 years
2-5 years
6-10 years
10-15 years
> 15 years
22. How did you receive training for implant placement?
Self-trained
Short (<5 day) course
Long (>5 day) course
Part of my speciality training
Implant companies (reps)
'Private academies'
Other, please specify:
23. Was this training adequate to make you confident in your ability to place implants? Y N
24. What percentage of implants that you restore do you personally place?
None
1-25%
26-50%
51-75%
76-100%
25. Why did you decide to place implants yourself?
Unable to get satisfactory results from other practitioners
No other practitioners placing implants in my area
Economic/financial reasons
Personal challenge
Other, please specify
26. Do you place implants that are restored by other practitioners? Y N
27. Would you be interested in participating in a submission to the HPPCSA regarding expanding the scope of prosthodontists to include the placement of implants? Y N
28. Additional comments

Thank you very much for your participation. It is much appreciated!
ggeerts@uwc.ac.za fax 0866992250 / suenaiddoo@uwc.ac.za fax 021 9373182

Figure 1: The 27 item Questionnaire sent to Prosthodontists.

approval by the Commission on Dental Accreditation, for the single purpose of including education in dental implantology in the curriculum.¹² In 2005, the American College of Prosthodontists added the surgical placement of implant fixtures to its Accreditation Standards for Advanced Specialty Education Programs in Prosthodontics. A 2006 survey in the USA and Canada reported that of the 27 participating prosthodontic graduate schools, 11 required or allowed prosthodontic residents to surgically place implants.¹⁴ For those schools not implementing the introduction of surgical implant training in prosthodontic programmes, the following reasons were given: surgeons were not encouraging it, lack of staff, lack of time in an already full programme, lack of patients, and the possibility of undermining the good relationship among specialties.¹⁴

Lambert *et al* (1997) reported a positive correlation of experience in placing implants with their survival.¹⁵ In 1997, a small five-year retrospective study reported that the success rate (96.2%) of implants placed and restored by a prosthodontist was comparable to previously published success rates when the use of surgeons and restorative dentist teams were generally the norm.¹⁶ This suggested that a learning curve in the placement of dental implants is a common feature among all clinicians.

During the 2007-2010 period, the Health Professions Council of South Africa (HPCSA) delivered only four verdicts related to failed dental implantology treatment (two cases involving general dental practitioners and two, oral and maxillofacial surgeons).¹⁷ Without comparative data it is difficult to conclude whether these apparently small numbers indicate a general satisfaction with implant treatment by the South African patient population.

It is evident that open debate is warranted about whether dental implantology is currently correctly located in the dental arena, both educationally and clinically, and who should assume direction of monitoring modifications of policies and practices affecting the technique. Data reflecting current practice will be valuable in resolving some of the dilemma.

The aim of the present study was to determine the experience and opinions of prosthodontists regarding the surgical placement of implants.

The research proposal was reviewed and approved by the Senate Research and Ethics Committee of the University of the Western Cape. A cross-sectional survey consisting of a structured questionnaire was e-mailed to all prosthodontists who were registered as specialists with the HPCSA, were practising in South Africa and who were members of the South African Dental Association (SADA) or of the Academy of Prosthodontics of South Africa (APSA) (n=49).

The 27-item questionnaire consisted of open and closed-ended questions related to demographic information and to surgical and prosthodontic implant practice (Figure 1). Forty-nine questionnaires were sent by e-mail to practitioners with known, operational e-mail addresses. Questionnaires were returned via e-mail, or by facsimile if the participant wanted to remain anonymous. Reminders were sent out to all 49 participants twice, at a two-week interval. Data from the completed questionnaires were captured and statisti-

cally analysed using the EpiInfo programme. Statistical significance was set at 0.05 and strength of association was determined by means of measurement of relative risk (RR) and chi-squared test or Fisher's exact test.

The response rate was 49% (n=24) and the mean age of respondents was 50 years, eleven being older than that mean. The majority of the respondents were male (n=19). All respondents, with the exception of one, had received specialist training at one of the South African dental schools. The average number of years in practice as a prosthodontist was 15.4 years.

All respondents practised in one of the five larger metropolitan areas of SA and worked five days per week, except one whose working week was four days. Five respondents reported that they treated more edentulous than partially edentulous patients. Maxillofacial prosthodontics, replacing hard and soft tissue due to congenital defects or following trauma or cancer surgery, was carried out by thirteen respondents.

All of the respondents reported treating patients with fixed and removable implant-supported prostheses. Only three reported treating more partially edentulate patients with conventional removable prosthodontics than with fixed prosthodontics. All three of these respondents were female and were employed at a dental school. Seventeen (71%) respondents reported that more than half of their partially-edentate patients received implants. Twenty (83%) respondents reported that the majority of their edentulous patients received implants. Three of the four respondents, who more commonly treated edentulous patients with conventional prosthodontics, were employed at a dental school. Fifteen respondents reported that their practices were growing, nine reported that their practices were stable, and none reported that their practices were declining.

The majority (n=16, 67%) reported that they were generally satisfied with the placement of implants by other practitioners, eight (33%), however, were not. With regard to referrals from other specialists, ten prosthodontists reported receiving more referrals for implant treatment from periodontists, seven prosthodontists reported receiving more referrals from oral surgeons, seven reported an equal referral rate from periodontists and surgeons. All prosthodontists, except two, received referrals following failed implant placement by other practitioners (note: generalist or specialist not specified).

Six (25%) prosthodontists reported that they surgically placed implants themselves, two of those having done so for more than ten years, three also having placed implants that were subsequently restored by other practitioners. Five of the six prosthodontists who placed implants themselves, started doing so when they were younger than 50 years old. An additional five prosthodontists reported that they would like to surgically place implants. Seven of the eleven prosthodontists who routinely placed, or would like to place implants, were generally satisfied with the placement by others and eight of the eleven were younger than 50 years old. Indeed, younger prosthodontists were twice as likely to place implants as older prosthodontists (RR=2.2 and p=0.09). Prosthodontists who considered their train-

ing in implant placement to be adequate were four times more likely to place implants (FR=4.0, $p=0.03$) than those who were insecure of their exposure to implantology during their courses. Prosthodontists who attended short courses on Implantology were three times more likely to place their own implants (FR=3.3, $p=0.09$) than those who had not attended short courses.

The number of respondents (six) who reported placing implants themselves was too small to demonstrate any conclusive evidence on the reason why: all six had access to other practitioners in their neighbourhood who were routinely placing implants and four of those six were generally satisfied with placement by colleagues. Three of the six responded that they placed implants for financial or economic reasons. Two of these three were recently qualified prosthodontists (last five years). Four of the six prosthodontists indicated that placing implants satisfies a personal challenge.

Of respondents who reported not placing implants themselves, the majority (11) commented that they were unlikely to adopt the practice, even were it to become an accepted component of the speciality of Prosthodontics.

The majority of respondents ($n=18$, 75%), however, were interested in participating in a submission to the HPCSA requesting an expansion of the scope of practice for prosthodontists to include implant placement.

At the time of this study (2010), 76 prosthodontists were registered with the HPCSA. Of these, 49 were members of the SADA or APSA, practicing in South Africa, and listed current e-mail addresses. All 49 were sent the questionnaires via email. The response rate was 49%.

Since all responding prosthodontists treated patients with implants, it can be surmised that this modality has become an integral and important treatment-strategy in prosthodontic clinical practice.

It has been reported that younger prosthodontists expressed a greater desire to surgically place implants than older prosthodontists.¹⁴ The current survey confirmed this trend: five of the six prosthodontists who placed implants started to do so before the age of 50. Of the five prosthodontists who would like to place implants but as yet do not, four were younger than 50. However, because of the low sample size of the present study, no conclusive correlation could be demonstrated between age and those prosthodontists who are already surgically placing or wanting to place implants. This relationship, nevertheless, should not be ignored in any strategic planning in terms of future curriculum development and determination of the scope of Prosthodontics.

Several reasons were cited for prosthodontists placing, or wanting to place, implants themselves: a desire to undertake new challenges; reducing theatre and travelling time associated with assisting surgeons during implant placement; immediate placement and immediate loading protocols have simplified surgery; advanced radiology now makes the diagnosis and planning of implant cases easier; and more predictable and reduces complications which were due to unrecognised anatomical variations; the prosthodontist's knowledge of the three-dimensional incisal and occlusal

positions which would dictate the precise placement of future implants, and having control over the cases from the initial planning stage until completion. The reason why some prosthodontists wanted to place their own implants, but were not doing so was not investigated. It could be due to the fact that placing implants was considered to be outside the scope of practice of prosthodontics and that the technique was not part of the postgraduate curriculum. Only four of the group of eleven who routinely placed or had the desire to place implants expressed dissatisfaction with the placement of implants by others as a reason.

However, prosthodontists who were surgically placing implants were self-trained, had followed short courses or had attended a private academy and all were confident that this training was adequate to equip them to undertake the procedure.

Those prosthodontists not placing implants reported satisfaction with the placement of implants by others. Some felt that they were comfortable with their scope of practice and were therefore reluctant to take on more responsibilities. Surgically placing implants would extend the duty of care to maintaining and treating ailing and/or failing implants. This has traditionally, and in current practice been a responsibility of the practitioner placing the implant (usually the surgeon), and would increase the workload of the prosthodontist. The questionnaire did not include an enquiry dealing with the frequency of referring by the prosthodontist of ailing or failing implants to the surgeon. Such a question may have given an indication on the impact of managing these problems on a practice. In this regard, a survey on the occurrence of ailing implants and the treatment thereof might be relevant.

If South Africa follows international trends, prosthodontists in training increasingly will be exposed to surgical implant-associated procedures and the associated theory. Pressure from prosthodontists to be permitted to place implants is not expected to diminish. Therefore, the profession may be challenged to redefine whether (and if so, which), implant-related procedures should be included in the prosthodontic scope of practice. Does the prosthesis end at the abutment-implant interface, or is the implant an extension of the prosthesis? If so, should the placement of this prosthesis component be part of the prosthodontic scope of practice? Future strategies should be developed that will ultimately be of benefit to the patient.

No literature was found reporting higher failure rates of implants placed by prosthodontists compared with those placed by surgeons or periodontists. A positive correlation of the extent of surgical experience with implant survival was however reported¹⁵ and a small retrospective study found that success rates of implants placed by prosthodontists were comparable to previously published success rates.¹⁶ This suggests that a learning curve in the placement of dental implants is a common feature among all clinicians.

For the period January 2007 to June 2010, prosthodontists were not amongst the four practitioners suspended from practice by the HPCSA after failed implant treatment.¹⁷ However, all prosthodontists in the study sample, except two, reported having received referrals after complications or failed implant treatment performed elsewhere. Hence it appears

there are overall numerous problematic implant treatments, even though there were so few verdicts by the HPCOSA. Could these data suggest that not all complaints reach the HPCOSA or, are being settled out of court? The nature of the complications, and the reasons for the failed implant treatment affecting the cases referred to prosthodontists were not part of the questionnaire and could usefully be investigated further.

The scope of practice of prosthodontics in South Africa is largely determined by the content of the postgraduate curricula at dental schools. These curricula are subjected to a 5-yearly accreditation by a panel of South African specialists appointed by the HPCOSA. The curricula appear to be similar among the dental schools. External examiners at the final examination of postgraduate candidates are often specialists from other South African Prosthodontic departments. This also serves to establish and maintain similar standards among the South African dental schools. However, at the time of this survey, a statutory blueprint describing the scope of practice of prosthodontists does not exist.

In the USA, the inclusion of training in implant therapy in the graduate prosthodontic programme has led to an increase in duration of the course.¹³ Postgraduate prosthodontic programmes in USA have generally been shorter than in SA, where courses in prosthodontics are four years in duration. With the prosthodontic curriculum already being very full, is it practical to increase this period so as to include implant placement? Could the introduction of an optional additional postgraduate fellowship devoted to surgical implant placement for prosthodontists address this problem, as suggested by Eckert *et al.* (2002)?¹³ And by whom should this education programme be administered and driven?

The ultimate rationale for reviewing the scope of practice in a rapidly developing discipline, such as implant dentistry, is that the interests of the patient should be placed first.

The present study found that implant dentistry is already an established and comprehensive part of specialist prosthodontic practice in South Africa: most prosthodontists are generally satisfied with implant placement by other practitioners; almost all prosthodontists received referrals after failed implant treatment performed elsewhere; some prosthodontists place their own implants and acknowledge that specific training influences their decision to place their own implants. Age appears also to have an influence on the desire of these specialists to place their own implants.

This survey provides insights for future debate relating to the desirability of expanding the scope of practice of Prosthodontics to include the surgical placement of dental implants. The debate should be informed and impartial and geared towards:

1. improved quality of service and treatment outcome to the ultimate benefit of the patient; and
2. shifting paradigms in terms of the scope of practice of the specialties involved in implant treatment. This may challenge the traditional boundaries of specialties as they currently exist in South Africa.

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1. **Greta Geerts:** *BChD (US), PDD (UWCI), MChD (US Prosthodont)* Department of Restorative Dentistry, University of the Western Cape, Tygerberg.
2. **Sudeshni Naidoo:** *BDS(Lon), LDS,RCS (Eng), MDPH (Lon), DDPH,RCS (Eng), MChD (Comm Dent), PhD (US)*, Department of Community Dentistry, University of the Western Cape, Tygerberg.

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