

A SURVEY OF SURGICAL PROTOCOL PRACTICED BY DENTAL PRACTITIONERS FOR IMPLANT PLACEMENT IN BANGALORE (INDIA)

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ABSTRACT

Purpose: To present results of a survey to know the surgical protocol and associated materials used by dental professionals in Bangalore (Karnataka, India) for an efficacious implant practice.

Materials and Methods: A questionnaire was distributed to 200 dentists. The survey specifically targeted dentists who place dental implants; those who reported that they did not place dental implants were excluded. The questionnaire requested information regarding the protocol adapted by dentists during surgical phase of implant placement.

Results: A total of 104 respondents completed the survey. 12 surveys were partially completed and were not included in the results. Out of 104, 72 were dentists with a post graduation degree (M.D.S.) while 32 were general dental practitioners with only graduation degree (B.D.S.). Most of the respondents i.e. 68 practitioners had started practicing recently and had an experience of 10 years or less. Most dentists employ a simple OPG examination for planning an implant surgery.

Conclusion: most of the dentists follow the well documented techniques which have been documented in the literature. These techniques may be useful in reducing errors in placement of dental implant and increasing implant success rates, especially for inexperienced practitioners, dental students, surgical residents and dental implant trainees.

Key words: Dental implantology, survey, implant surgery, questionnaire study

INTRODUCTION

Dental implants are alloplastic materials which are surgically placed into the residual alveolar bone chiefly as a foundation for the prostheses. Implants have been used to provide support for dental prostheses since 1930, and its popularity has increased with the introduction of the concept of osseointegration.¹ Currently, implant dentistry is being commonly used for restoring both partially and completely edentulous jaws successfully.²

For achieving successful osseointegration, implant stability is one of the fundamental pre-requisites and must be maintained for the entire healing period. Implant stability is influenced basically by 3 factors i.e. the implant (material, design and dimensions of the fixture), the patient (quality and quantity of bone) and the operator (surgical technique). Although a wide number of studies focus on the efficiency of various implant design characteristics and bone healing response, only a few of them analyze the surgical technique.³

Hence, as the demand for implant treatment has increased tremendously, there is a need to establish a standardized surgical protocol for successful implant placement. Therefore, the objective of this survey is to know the surgical protocol and associated materials used by dental professionals in Bangalore (Karnataka, India) for an efficacious implant practice.

MATERIALS AND METHODS

A questionnaire was framed, after discussion with specialists in the field of implantology. It consisted of 40 questions. In the next step, the questionnaire was piloted to a small sample of practicing implantologists to identify the relevant questions and their focus towards the objective. Following feedback from them, the final and agreed questionnaire was prepared consisting of 20 questions excluding the questions regarding personal details and experience. The questionnaire requested information regarding the protocol adapted by dentists during surgical phase of implant placement.

The questionnaire was distributed to 200 dentists. The survey specifically targeted dentists who place dental implants; those who reported that they did not place dental implants were excluded. The respondents were asked to tick/mark the response of their choice. Some of the questions allowed the respondents to write a response or comment.

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RESULTS

A total of 104 (52%) respondents completed the survey. 12 surveys (6%) were partially completed and were not included in the results.

Demographic Information

Out of 104 (100%), 72 (69%) were dentists with a post graduation degree (M.D.S.) while 32 (31%) were general dental practitioners with only graduation degree (B.D.S.) (Fig 1). Most of the respondents i.e. 68 (65%) practitioners had started practicing recently and had an experience of 10 years or less (Fig 2).

The findings for each of the survey questions are as follows;

Question 1: *Radiographic examination commonly used for planning implant surgery:* Seventy two

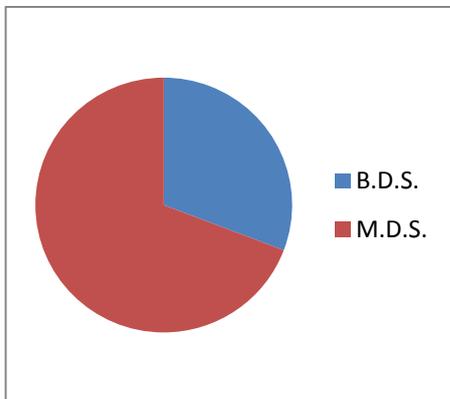


Fig 1. Educational Qualification of the dentists

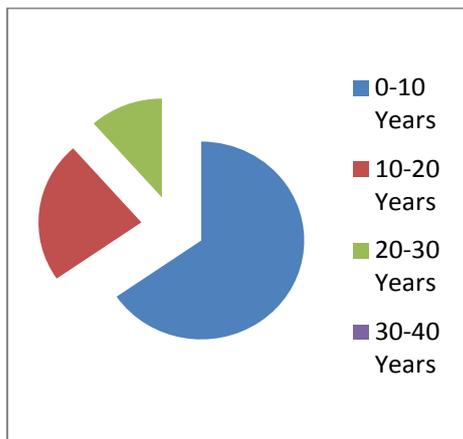


Fig 2. Years of experience of the respondent dentists

dentists (69%) reported that they employ OPG (Orthopantomogram) for planning implant

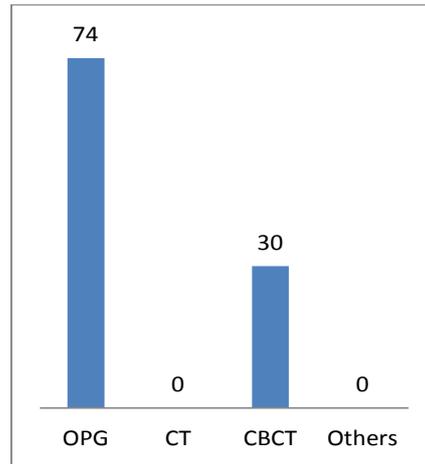


Fig 3. Radiographic Examination commonly used for planning surgery

surgeries whereas twenty eight dentists (27%) preferred to use CBCT (Cone beam computed tomography) and only four (.04%) found CT (Computed tomography) to be more convenient. (Fig 3)

Question 2: *Ridge augmentation for patients with insufficient bone quantity:* Sixty eight dentists (65%) reported that they advise ridge augmentation procedures using grafts and surgeries for patients with insufficient bone quantity whereas thirty six (35%) said that they don't place implants in patients with poor residual ridge. (Fig 4)

Question 3: *Pre-surgical antibiotic regimen:* Seventy seven practitioners (74%) feel the necessity to give antibiotic regimen before implant placement. In contrast, twenty seven practitioners (26%) felt , it is not needed. (Fig 4)

Question 4 & 5: *Placement of implants immediately after extraction:* Sixty nine respondents (66%) placed implants in the extraction socket immediately after extraction of the tooth while thirty five (34%) on the other hand did not practice this procedure. (Fig 4) Out of the sixty nine following this technique, forty six (67%) make the incision for implant placement surgery before the extraction while twenty three (33%) prefer to make the incision after the extraction.

Question 6: *Type of anaesthesia used for the surgery:* All one hundred and four respondents (100%) performed implant surgery under local anaesthesia.

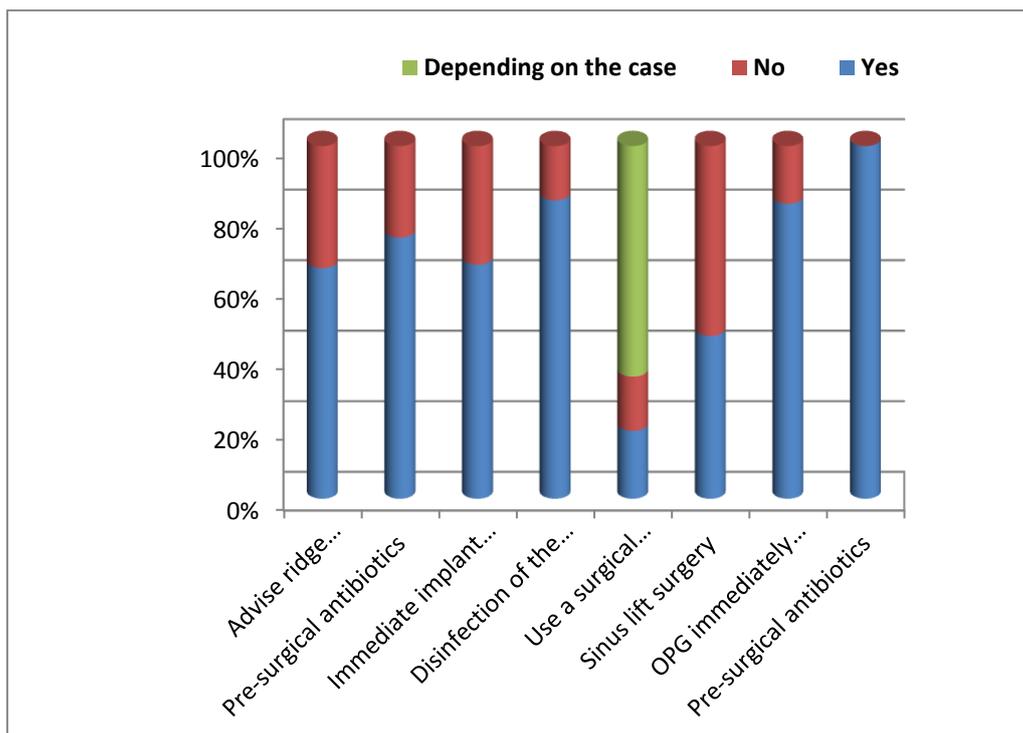


Fig 4. Response of the dentists to certain questions

Question 7: *Type of operatory used:* Ninety two practitioners (89%) performed implant placement surgery on a dental chair while twelve practitioners (11%) used either a dental chair or a minor OT (operation theatre) for the surgery, depending on the case.

Question 8: *Disinfection of the surgical site:* Eighty eight practitioners (85%) disinfect the surgical site before the surgery using chlorhexidine or betadine mouthwash for better success rates while sixteen practitioners (15%) do not consider it effective. (Fig 4)

Question 9, 10 & 11: *Use of surgical guide/template:* Twenty (19%) out of 104 respondents said they use a surgical guide or template for accurate placement of implants, while sixteen (15%) do not prefer to use them and sixty eight (66%) respondents said that they decide to use a surgical guide or template as per the requirement of the case. (Fig 4) Out of 88 respondents who used a surgical guide or template, twenty three (26%) used diagnostic wax up for its fabrication while thirty one (35%) used the pre-existing restoration or dentition for the same and thirty four (39%) used either one depending on the case. Also, another requirement is the incorporation of a radio opaque material in the surgical guide to visualize the position of implants with respect to the surrounding structures. Forty nine (56%) used gutta percha as

the contrasting material and thirty nine (44%) used a metal rod or wire for this purpose.

Question 12: *Type of incision used for elevating the flap:* Eighty five (82%) dentists reported that they use only crestal incision for elevating the flap for the surgery while nineteen (18%) dentists also used vestibular incision along with crestal incision. (Fig 5)

Question 13 & 14: *Surgical technique followed:* Almost similar number of respondents (44%) either use only single stage surgical procedure or use both single stage and two stage surgical procedure depending on the case whereas twelve (12%) reported that they use only two stage surgical procedure. Out of fifty eight (56%) respondents who use either occasionally or regularly a two stage surgical procedure, thirty two (55%) use a tissue punch to expose the implant during the second stage while an equal number of respondents i.e. thirteen each (22% each) use either electrocautery or an incision for the same. Lasers were rarely used.

Question 15 & 16: *Sinus lift surgery:* Forty eight respondents (46%) practiced the sinus-lift technique in cases with insufficient bone height in the maxilla while fifty six (54%) did not practice the same. (Fig 4) Out of the forty eight practicing it, thirty seven (77%) use indirect sinus floor elevation for the procedure while eleven (23%) use both either direct or indirect sinus floor elevation for the same.

Question 17: *Suture material used:* Following placement of implants the flaps were approximated, sixty one respondents (59%) used non-resorbable sutures for closing the wound whereas forty three respondents (41%) used resorbable suture material.

Question 18, 19 & 20: *Post-surgery:* Eighty seven dentists (84%) advise an OPG examination immediately after implant placement for assessing the final position of the implants whereas seventeen dentists (16%) postpone it for a later appointment. Also, all one hundred and four respondents (100%) preferred to prescribe post surgical antibiotic medication to the patients and sixty two dentists (60%) recalled the patients for follow up after 7 days while forty two (40%) preferred to schedule the follow up appointment after 24 hours. (Fig 4)

DISCUSSION

In three decades, dentistry has changed tremendously due to the incorporation of dental implants in increasing the options of dental treatment and patient satisfaction.¹ A fundamental prerequisite for implant success is substantial primary stability.⁴ Several surgical techniques can be utilized to increase the initial stability of implants. Although a wide and comprehensive mass of studies focuses on the effectiveness of diverse fixture characteristics, very few works analyze relations between site preparation technique influencing osseointegration.³

Surveys have been used in the past by the dental professionals to establish a conclusion, especially in areas of limited or conflicting evidence. The survey conducted, showed that most dentists employ a simple OPG examination for planning an implant surgery. CBCT was also found to be a popular technique for the same. A study by Kim et al concluded that Digital panoramic radiography can be considered a simple, readily available and considerably accurate pre-operative assessment tool in the vertical dimension for dental implant therapy.⁵ But recent studies conclude that there is superior radiographic visualization for all important high-contrast structures in pre-surgical implant dentistry assessment for CBCT imaging in contrast to OPG.^{6,7}

The use of prophylactic antibiotics for implant placement remains controversial. The survey highlighted that prescription of pre-surgical and post-surgical antibiotics is a common practice by dentists for a successful outcome of dental implants. A review by Eposito et al determined there was evidence that 2 g of amoxicillin given orally 1 hour preoperatively and postoperatively significantly reduced early failures of dental

implants.^{8, 9} Another study by Lang et al also supported the use of antibiotics.¹⁰

Recently, Immediate implant placement has gained popularity because it reduces treatment time, number of surgeries and post-extraction bone loss. The survey showed that most dentists practiced placing implants immediately after extraction. Most dentists perform incision and elevation of the flap, followed by extraction and finally implant placement. A review by Lang et al concluded, a high success rate of dental implants placed immediately after extraction.¹⁰⁻¹²

The survey also depicted that most dentists performed the implant surgery under local anaesthesia on a regular dental chair and use a betadine or a chlorhexidine mouthwash for disinfecting the surgical site for better success rates. A study by Lambert et al concluded that rinsing preoperatively with chlorhexidine reduces microbial complications following implant placement.¹³ Also, another in-vivo study supports the above practice, that chlorhexidine in suspension form is more effective in inhibiting *Porphyromonas gingivalis* than the use of antibiotics.¹⁴

It was also reported that the use of surgical guide by dentists was dependant on the case and the guide was fabricated usually by duplication of pre existing restoration. But recently, it is seen that accurate placement of implants has been best achieved clinically with the help of a computer aided surgical guide. Compared to the conventional technique, limitation with computer-aided implant surgery is substantially greater investment and effort.¹⁵ Also, a Randomized control trial (RCT) by Arisan et al deduced, that highest probability of positioning error is associated with the use of freehand method and utilizing computer-aided methods may alleviate this.¹⁶

Among the surgical techniques, both single stage and two stage surgical techniques were equally popular among dentists in the survey. Although, limited literature is available regarding the effect of type of surgery on success of dental implants. Dentists using a two stage technique, mostly used a tissue punch for the second surgery. The survey highlighted that dentists are still reluctant to use the sinus lift surgery and the dentists practicing it usually practice the indirect sinus floor elevation technique. In contrast, the literature reports that classic lateral antrostomy pioneered by Tatum appears to be the most common sinus lift procedure.¹⁷ Also, both sinus elevation techniques did not seem to affect the implant success rate.¹⁸

Post–surgery the dentists used both resorbable and non-resorbable sutures for closure of the flaps. The type of suture used did not report any effect on the success of implants in the literature. Also, the survey exhibited that most dentists ask for an OPG immediately after the surgery to confirm accurate placement and recall the patients for a follow-up examination after 7 days.

CONCLUSION

Within the limitations of the study, few questions were framed on practitioner’s opinion, but not literature evidence. It can be concluded from the survey that, most of the dentists follow the well documented techniques which have been documented in the literature. These techniques may be useful in reducing errors in placement of dental implant and increasing implant success rates, especially for inexperienced practitioners, dental students, surgical residents and dental implant trainees. Hence, further research is needed to assess the effectiveness of this protocol in an evidenced based practice and thus delivering the best to their patients.

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