Satisfaction level ~~in dental phobic patients~~ with implant-supported rehabilitation performed under general ~~anaesthesia~~anesthesia in patients with dental phobia: a prospective study

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Thank you for providing this opportunity to assist you with this manuscript. I have edited the document for language, grammar, tone, clarity, structure and readability.
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Do go through all my changes and comments carefully, and do not hesitate to contact me via your Client Manager should your intended meaning not be satisfactorily conveyed, or if you require any clarifications; I will be happy to answer any questions you might have. All the very best with your submission!

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Abstract

~~Background:~~ P~~hobic p~~atients with dental phobia avoid dental treatment, impairing their oral health and making it challenging to offer them prosthetic rehabilitation. This study evaluated patients' experience of implant-supported rehabilitation treatment ~~prosthetic treatment after implantation~~ performed under general ~~anaesthesia~~anesthesia due to dental phobia and severe pharyngeal reflexes ~~(SPR)~~. The effect of sex~~gender~~, age, and implant location ~~of implantation~~ on patient satisfaction was prospectively evaluated~~tested~~.

~~Methods:~~ Two hundred and five patients underwent implantation under general anesthesia ~~both~~ in one or both jaws~~maxilla and mandible, respectively~~. After a trans-gingival healing period of 6–8 weeks, fixed implant bridges were inserted. Patients ~~completed~~ were administered the O~~o~~ral H~~h~~ealth I~~i~~mpact P~~p~~rofile ~~questionnaire~~ (OHIP-14~~).~~) questionnaire and a~~A~~n additional set of six ~~special~~ questions ~~was also developed and considered~~. ~~Analysis of t~~The OHIP-14 total score was ~~made~~ analyzed using logistic~~s~~ regression. The Wald chi-square test was used to ~~analyse~~analyze the effect of age, sex,~~gender~~ and implant location on patient satisfaction ~~of implantation.~~ Effect sizes were estimated as odds ratios and associated 95% Wald confidence intervals. ~~Results:~~ Eighty-two of the 205 patients were included after prosthetic treatment. After the start of treatment, 38 patients were excluded (4 died and 34 could no't be reached)~~).~~. Forty-three patients (age: 30–90 years)were finally included in the OHIP-14-analyses ~~were made by 43 patients (30–90 years)~~after exclusion. In total, 67% of ~~67% of~~ patients were totally satisfied with the ~~whole~~ implant rehabilitation (scor~~c~~ing 0). ~~Mean of total score was 2.5.~~ Only age significantly affected ~~significantly~~ (P~~p~~ = 0.014) patient~~s~~ satisfaction. Y~~The obtained data indicate that y~~ounger patients (30–64 years), especially women, were~~are~~ less satisfied with their treatment (4.95) than older patients (0.3; ~~) for age group (~~65–90 years). Special questions' data showed that 94.5% of patients were satisfied with ~~their~~ treatment. ~~77.3% continued regular check-up after treatment and 96.9% would undergo the same treatment again. 95.5% would recommend implants to a friend of colleague.~~

~~Conclusion:~~ Sex~~Gender~~ and implant location ~~of implantation~~ ha~~d~~ve no significant influence on patient satisfaction. Younger patients, especially women, were~~are~~ less satisfied than older patients.

Introduction

Anxious patients ~~due to~~with dental phobia or severe pharyngeal reflex~~es~~ (SPR) show poorer oral health and more decayed and missing teeth than typical individuals [1]. Prosthetic treatments are needed for ~~recovery of~~replacing missing teeth in these patients;~~,~~ however, these patients are uncooperative and show poor compliance to dental treatment ~~compliance~~, which complicates any treatment,~~;~~ increases the risk of failure, and makes it difficult to perform implant-supported rehabilitation [2, 3]. A ~~very~~ long procedure is expected if

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implantation is considered for these patients. Consequently, local anesthesia is~~will be~~ insufficient for ~~to~~ ~~perform~~ an ~~adequate~~ operation [4, 5]. In such cases, surgery under general anesthesia is~~could be~~ an option that enables patients undergoing implant treatment to improve their oral health~~,~~ and well-being.

General ~~anaesthesia~~anesthesia makes it ~~convenient~~ possible for patients to ~~have~~ undergo all surgical procedures ~~carried out~~ in one session, ~~and~~ while the~~n~~ implants can be installed in the maxilla, ~~or~~ mandible, or ~~if needed in~~ both jaws in ~~one~~ another single appointment [6]. ~~As known, r~~Rehabilitation with implants prevents continuous alveolar bone resorption~~,~~ and preserves alveolar ridge height and width, ~~which ensures~~ensuring positive ~~a~~esthetic outcomes [7, 8] and~~,~~ comfort and efficacy of prosthetic reconstruction [9–~~,10,~~11]. Additional positive factors for patients are increase in self-esteem~~,~~ and patient~~s'~~ satisfaction [12, 13].

When assessing the outcome of implant treatment, it is important to consider ~~both the~~ clinicians' and ~~the~~ patients' ~~appraisals~~ perspectives [14–~~,15,~~16]. For ~~the~~ clinicians, implant survival, prosthesis longevity, and ~~the~~ complications are the most important factors. However~~On the other hand~~, cost effectiveness ~~benefit,~~ as well as social and psychological impact of the treatment are more important for ~~the~~ patients [17, 18]. Patient~~s'~~ satisfaction depends on function, comfort, esthetics, and speech disruption [15, 17] and may represent a crucial factor of implant success for the patient [19–~~,20,21,~~22]. Patient satisfaction is seen as a vital aspect ~~by evaluating~~of the overall quality of dental rehabilitation and should be ~~made~~ determined on a regular basis to allow clinical practitioners to assess their services [23–~~,24,~~25].

The Oral Health Impact Profile (OHIP) questionnaire is an instrument developed ~~to be used~~for use in clinical studies [26–~~,27,28,29,30,31,32,~~33] to measure o~~O~~ral h~~H~~ealth-related q~~Q~~uality of l~~L~~ife (OHRQoL). Several short versions of this tool have been developed, such as ~~the version~~ OHIP-14~~-~~, which consists of seven subgroups with two questions for each subgroup~~one~~ [27, 28, 31]. The OHIP-14 questionnaire used in ~~this~~ the current investigation was previously validated and recommended for use in clinical studies [27, 28, 31]; it covers a wide range of oral health-related problems, ~~i.e.~~i.e., functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability, and handicap [26,29–~~,30,~~31].

Most dental satisfaction studies ~~were~~ have been performed on patients who have undergone general dental treatment [34], and patients with dental anxiety show ~~have been shown to be significantly~~considerably ~~associated with greater~~high dissatisfaction [35]. Various studies have evaluated~~investigations were made to study~~ patient satisfaction with implant treatment [41, 42]. However, t~~But t~~o the best of our~~the~~ knowledge ~~of the authors of this study~~, ~~there is~~ no study has investigated satisfaction of patients experiencing~~suffering from~~ dental phobia or SPR ~~after~~ with implant treatment under general anesthesia. ~~Therefore, this study fills an important gap in the academic field and should be used to promote a debate.~~

Therefore, the present~~he~~ study aimed ~~of the study is therefore~~ to evaluate the satisfaction of partially edentulous patients, experiencing~~suffering from~~ dental phobia and SPR, with their implant-supported rehabilitation performed~~carried out~~ under general anesthesia in one or both jaws. The effect of sex~~gender~~,

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age, and implant location ~~of implantation~~ was ~~ill be tested~~evaluated. This study evaluated patients' experience of oral surgical and prosthetic procedures as well as their satisfaction with the treatment outcome. The hypotheses of this study are as follows: 1) p~~P~~atients exhibiting~~suffering from~~ dental phobia and SPR ~~will~~ experience good patient satisfaction after implant treatment under general anesthesia~~.~~; 2) age, sex~~gender,~~ and implant location ~~of implantation will~~ affect patient~~s~~ satisfaction; and 3)~~.~~ success of rehabilitation with fixed implant ~~fixed~~ bridges ~~by~~ in these patients is similar to ~~th~~that in patients~~at by patients~~ treated without general anesthesia.

Results

Eighty~~-~~-two patients who were treated with implants under general anesthesia between~~-~~ January 1, 2006, and December 31, 2012, ~~01.01.2006 to 31.12.2012~~ were ~~and~~ included ~~and treated in this study~~. Subsequently~~After start~~, 38 patients were excluded (4 died and 34 ~~could not be reached to complete the~~were lost to follow-up ~~follow-up~~ after prosthetic treatment). One patient had missing data on several OHIP-14 items. The total ~~patients'~~ number of patients included in ~~the analyses of~~ the OHIP-14 analyses ~~was~~was 43 (age range: 30–90 years). Table 2 shows the distribution of sex~~gender~~, age, and implant location ~~of implantation~~ among these patients. The majority of patients were women ~~females~~ (63.6%). Of all implants inserted, 47.7% ~~of the implants~~ were inserted in the maxilla and 31.8% ~~of the patients had implants~~were ~~installed~~ inserted in both jaws.

The implant treatment of all 43 patients included in this study was successful with regard to ~~as far as~~ function and comfort. The follow-up period after ~~the~~ prosthetic reconstruction ranged from 3 to 9 years. Figure 1 shows the OHIP-14 total score distribution for all patients. The OHIP-14 total score was low for the majority of the patients, with 67% scoring 0 and with a mean value total score of 2.5. The OHIP-14 total score by subgroups, i.e., sex~~gender~~, age, and type of intervention group, ~~are~~ is shown in Figures~~.~~ 2, 3, and 4, respectively. The graphs seem to suggest some differences. However, the data indicate that younger patients (age group 30–64 years), especially young women, were~~are~~ less satisfied (mean = 4.95±~~+/-~~ 9.81) than older patients (age group 65–90 years~~;) with (~~mean = 0.3±~~+/-~~ 0.76). Logistic regression analysis (Table 3) was used to investigate the relationship between these background variables and the OHIP-14 total score.

Discussion

~~The literature shows that patients satisfaction has been considered as an important criterion for treatment success since it is associated with compliance and in turn, anticipated treatment quality [9,10,11, 37].~~ The first hypothesis of ~~this~~ the current study was confirmed because the results clearly demonstrated that the included patients were~~are~~ generally satisfied with their treatment and had~~ve~~ good OHRQoL after treatment. The ~~overall of~~ patients showed~~have even~~ change~~d~~ in their dental ~~behaviour~~behavior, which~~and~~ continued

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even after the ~~performed~~ oral rehabilitation, and they ~~to~~ visited a dentist or an oral hygienist for regular check-ups. The second hypothesis was partially confirmed ~~in part~~ because the obtained data showed that only age significantly affected~~s~~ patient satisfaction. Younger patients ~~are~~ were less satisfied than older patients. However,~~But~~ patients' sex~~gender~~ and implant location ~~of implantation~~ did~~e~~ not influence patient satisfaction. Evaluation of the results showed that ~~the~~ implant-supported bridges were successfully maintained in all patients after 3 to 9 years of function, which confirmed the third hypothesis. ~~The s~~Success was measured as the retention of the original screw-~~-~~retained bridges over time. Patient satisfaction is an important criterion for treatment success since it is associated with compliance and, in turn, anticipated treatment quality [9–11, 37]. Similar results of success have been ~~shown~~ reported in several studies on patients treated without general anesthesia [9, 10, 37–~~,38,~~39].

Precise evaluation of the results indicated~~s~~ that only age has a statistically significant effect ~~($p < 0.05$)~~ on patient~~s'~~ satisfaction~~, reflecting~~ and that the number of patients viewing themselves as "problem free" increased with age. Analyses of data by subgroups indicated that younger patients, especially women, showed more psychological discomfort and ~~are~~ were less satisfied than older patients ~~(Figs. 2 and 3)~~. This is an interesting observation and ~~may reflect~~suggests that ~~a~~esthetics has become an important issue in modern society [40] and that the social lifestyle and attitude of younger people~~s'~~ ~~social life style and attitude differ~~ differ from those of older ~~individuals'~~people. These results are in line with those of a previous study [28], which ~~also~~ shows that oral discomfort has different influences on life depending on sex~~gender~~ and age. In the current study, the sex~~Gender~~ of patients and location of the intervention showed ~~in this study~~ no significant influence on patient~~s'~~ satisfaction ~~(P > 0.05)~~. However,~~ a~~ remarkable, ~~aspect is that,~~ in all age groups presented in ~~the~~ graph 2, ~~there are less satisfied~~ women were less satisfied with their treatment than men.

These data are in accordance with the findings of Pjetursson et al. [41] who ~~[41] finding; they~~ reported~~find~~ that more than 90% of patients treated with crowns or implant-supported fixed partial dentures are completely satisfied. The obtained results confirmed that 77.3% of the included patients in this study visited a dentist or an oral hygienist for regular check-up after treatment ~~check up~~. Most patients (93.9%) did~~e~~ not regret this kind of treatment and ~~(~~96.6%~~)~~ were willing to have the same treatment performed again if ~~needed~~required.

The findings of ~~this~~ the current study indicate that ~~the~~ preoperative psychological factors due to dental phobia and SPR~~s~~ have no effect on ~~post-treatment~~ patient~~s'~~ satisfaction with their implant treatment performed under general anesthesia.

~~From the results we conclude,~~ To conclude, i~~with regard to the problem addressed that i~~t is recommended ~~to perform~~ that implant treatment should be performed under general anesthesia ~~on~~ in patients with dental phobia and SPR ~~under general anesthesia~~. Consequently, implant-supported prosthes~~c~~is can~~would~~ become a treatment option for these patients who otherwise refuse dental treatment, because of~~due to~~ the availability

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of general anesthesia ~~become a treatment option for these patients who otherwise would stay refusing .~~ ~~any~~ Furthermore, ~~contact to the~~ dental professionals, ~~who~~ in turn, ~~have~~ usually exclude~~d~~ implant treatment in ~~in cases involving~~ patients with phobia or SPR~~s~~.

Methods

In the present study, t~~T~~he OHIP-14 questionnaire was used to measure patient satisfaction ~~in this investigation~~. It is a 14-question~~s~~ survey, grouped into~~as~~ seven domains: functional limitation, physical pain, psychological discomfort, physical disability,~~:~~ psychological disability, social disability, and handicap (Annex). The OHIP-14 questionnaire has been previously translated into Swedish; ~~and~~ the reliability and validity ~~has~~ have been tested and the questionnaire has been recommended for use in studies in the Swedish population [28]. Additionally, a set of six special questions related to patients' dental ~~behaviour~~behavior and treatment satisfaction (Table 1) was developed and used in ~~Swedish~~ Sweden~~and used as well~~. The study proposal was submitted to the ethical committee of Stockholm in Sweden (No 2014/1811–31/1). The board of the ethical committee did not see any ethical research obstacles to this study.

Study population

This prospective study in~~volved~~cluded partially edentulous patients who had lost their teeth in one or both jaws and~~-~~ were treated under general an~~a~~esthesia with screw-~~-~~retained fixed implant bridges between ~~1~~ January 1, ~~2006~~2006, ~~to~~and ~~31~~ December 31, ~~2012~~2012, in a private clinic in Stockholm, Sweden. Informed consent was obtained from all individual participants included in the study. All treated patients had to be in ~~a~~ good general health ~~condition~~ to be eligible for undergoing general ~~anaesthesia~~anesthesia, which was performed and monitored by an ~~anaesthetist~~anesthetist. The implant surgery itself did not differ from the conventional implant procedure used for non-phobic patients treated without general ~~anaesthesia~~anesthesia.

Inclusion criteria

Patients were selected according to the following inclusion criteria:

1) p~~P~~atients with dental phobia and ~~SPR severe pharyngeal reflexes.~~

2) patients with~~In~~ good general health ~~condition.~~

3) patients w~~W~~ith edentulous maxilla, mandible, or both~~.~~

4) patients w~~W~~ith edentulous jaws a minimum of 6 months after extraction~~.~~

5) patients w~~W~~ith no bone augmentation prior to or in combination with implant insertion~~.~~

6) i~~I~~mplantation performed under general ~~anaesthesia~~anesthesia~~:~~

7) implantation w~~W~~ith 4–6 Straumann implants (Straumann AG, Basel, Switzerland) in the maxilla~~.~~

8) implantation w~~W~~ith 4–5 Straumann implants in the mandible~~.~~

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Identifies the institutional and/or licensing committee that approved the experiments, including any relevant details.
Confirms that all experiments were performed in accordance with relevant named guidelines and regulations.
Confirms that informed consent was obtained from all participants and/or their legal guardians.

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9) implantation w~~W~~ith screw-~~-~~retained fixed implant bridges~~.~~

Exclusion criteria

The following p~~P~~atients were excluded from the study:

1) patients t~~T~~reated without general ~~anaesthesia~~anesthesia~~.~~

2) patients t~~T~~reated with an ~~other~~ implant system other than Straumann implants~~.~~

3) patients w~~W~~ith ~~other~~ rehabilitation other than screw-~~-~~retained fixed implant bridges~~.~~

4) patients t~~T~~reated with bone augmentation ~~were excluded.~~

Treatment protocol

Patients were treated according to the following protocol:

1) Total extraction due to caries or periodontitis or both was ~~done~~ performed under general ~~anaesthesia~~anesthesia, followed by at least a 6-month healing period.

2) Interim removable dentures were fabricated~~produced~~ in advance and used by the patient during the healing period.

3) Straumann implants were placed in the edentulous maxilla, mandible, or both jaws (4–6 implants in the maxilla and 4–5 implants in the mandible) while patients were under general ~~anaesthesia~~anesthesia ~~in the edentulous one jaw or in both (4–6 implants in maxilla, 4–5 implants in mandible)~~.

4) A trans-gingival healing period of a minimum of 6 to 8 weeks was maintained before continuing the treatment (delayed loading).

5) Final restoration with f~~F~~ixed implant bridges was performed. ~~treatment was the final restoration.~~

Protocol for general an~~a~~esthesia

Premedical evaluation of each patient was performed by the ~~anaesthetist~~anesthetist. General anesthesia was preoperatively induced~~Induction starts~~ ~~preoperatively in~~ through a peripheral venous line with 4 mg b~~B~~etamethasone~~,~~ (Celestone, Merck & Co. Inc., Whitehouse Station, NJ USA), 0.5 mg a~~A~~tropine sulphate (Myian AB, Stockholm, Sweden), and 2 g b~~B~~enz~~s~~ylpenicillin (Meda AB, Solna, Sweden). In case of allergy to b~~B~~enz~~s~~ylpenicillin, clindamycin was used (Clindamycin Orifarm, Stockholm Sweden). Fluid with glucose, r~~R~~ehydrex 500 mL (Fresenius Kabi, Halden Norway)~~l~~, was administered during ~~anaesthesia~~anesthesia ~~(Fresenius Kabi, Halden Norway)~~.

Protocol for surgical procedure under general an~~a~~esthesia

Xylocaine/adrenaline (Dentsply Pharmaceutical, ONY, United Kingdom) was used ~~as~~ for local ~~anaesthesia~~anesthesia. A s~~S~~urgical flap was ~~designed~~ individually designed allowing good inspection of the

bone and surrounding area. ~~.~~Further, 4–6 or 4–5 Straumann implants ~~4 to 6 and 4 to 5~~ were placed in the maxilla and mandible, respectively. The implants were inserted with external saline cooling of the drills. Healing abutments ~~were applied~~were placed for external healing. Wound closure was done with Vicryl 3–0 (Ethicon, Johnson & Johnson, Diegen, Belgium). The patients were allowed to use their soft relined removable dentures directly after implant insertion. A minimum of 6 to 8 weeks of healing time was maintained before taking an impression ~~taking~~ for prosthetic restoration.

Data collection

Data ~~of~~ from the OHIP-14 questionnaire and the set of special questions were collected through follow-up visits at least 3 years after prosthetic treatment. The patients filled the patient consent form and ~~the~~ questionnaires at the recall examination under the supervision of one of the authors who was~~is~~ not involved in the treatment to avoid bias and any effects of interpersonal reactions. The ~~individuals~~ patients expressed their level of satisfaction by answering questions. These answers ~~hav~~could have~~e~~ a score from 0 to 5.

Data analysis/statistical methods

The n~~N~~umber, sex, and age of the included patients~~, gender, age;~~, number of ~~installed~~ implants placed; and date of implant surgery ~~were~~ are ~~summarised~~summarized using descriptive statistics, including mean, standard deviation ~~(SD)~~, median, range, frequency, and percentage. The OHIP-14 total score was analyzed using logistic regression. The Wald chi-square test was used to analyze the effect of age, sex, and implant location. Effect sizes were estimated as odds ratios and associated 95% Wald confidence intervals.

Data Availability Statement

Acknowledgements

Author Contributions

Additional Information

Competing Interest Statement

References

Figure Legends

Tables

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