IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 5 Ser.8 (May. 2020), PP 01-08
www.iosrjournals.org

Screw retained single implant prosthesis – A detailed Case Report

Dr. Bhavya Venkatesh [1], Dr. Gautam Shetty [2], Dr.Gangaiah makam [3], Dr. Shreya Bukkapatnam [4], Dr. Sindhu Sudhakar Kumararama [5]

[1]*Post Graduate Student (Department of Prosthodontics Crown and Bridge and Implantology,Rajarajeswari Dental College and Hospital, Bangalore,India)*
[2] *MDS, Professor and Head (Department of Prosthodontics Crown and Bridge and Implantology, Rajarajeswari Dental College and Hospital, Bangalore, India)*
[3]*MDS, Professor (Department of Prosthodontics Crown and Bridge and Implantology, Rajarajeswari Dental College and Hospital, Bangalore, India)*
[4] *MDS, Senior Lecturer (Department of Prosthodontics Crown and Bridge and Implantology, Rajarajeswari Dental College and Hospital, Bangalore, India)*
[5] *MDS, Senior Lecturer (Department of Prosthodontics Crown and Bridge and Implantology, Rajarajeswari Dental College and Hospital, Bangalore, India*)

Abstract: *This case report guides through the steps for preparing a screw-retained single implant restoration. Impression making using open-tray technique and delivery of the crown is presented in a step-by-step manner. Also, the advantages and disadvantages of screw-retained crowns are discussed.*
Key Word*: dental implants, single implant restoration, screw-retained prosthesis*

Date of Submission: 04-05-2020 Date of Acceptance: 18-05-2020

I. Introduction

With the high rate of implant success for completely edentulous, partially edentulous, and single tooth restorations, the concept of implant therapy is now a highly predictable treatment modality. [1] There are two types of Prosthetic restoration options available for fixation on dental implants. They are Screw retained and cement retained Restorations. The choice for screw or cement retention appears largely to depend on the clinician's personal preference rather than on scientific basis.[2]

Retrievability is the main advantage of screw-retained crowns that would make it more favorable to many clinicians.[3] It allows better control on the hygiene of the implants and surrounding mucosa, also, crowns can be easily repaired in case of crown fracture.[4]Implant angulation may be a limitation to the usage of screw-retained restorations in some oral sites.[5]

This article describes every step in the fabrication of Screw-Retained Crown Restoration.

II. Case Report

A 39 year old male reported to our department with chief complaint of missing tooth (lower right first molar).The tooth had been extracted after an opinion of failed RCT. After a thorough oral examination, patient was educated about various treatment options like fixed partial denture and implant supported prosthesis. Patient chose implant as a treatment option.

Preoperative Treatment Planning Phase

A detailed case history was taken which includes medical history, past dental history, personal habits like smoking etc., patient revealed that he was nonsmoker and no relevant medical history.

The intraoral examination showed that he had good gingival and periodontal health. The residual ridge had sufficient width mesiodistally and buccolingually and was covered by healthy keratinized mucosa. On radiographic examination, sufficient bone height was available. After measuring the bone radiographically using CBCT (Figure 1) surgical placement of implant was planned measuring (3.75 X10mm ARDS IMPLANTS LTD hashmika St -4, Rishon Lezion Israel, 7520133). Patient was prescribed with 500mg of Amoxicillin 48 hours prior to the surgical procedure. Routine blood investigations were done.

Surgical Phase

Patient was instructed to rinse chlorhexidine Gluconate 0.12 % (HEXIDINE, ICPA HEALTH PRODUCTS LTD,india) mouth wash for 1 minute. Before surgery, face and the operating sites were scrubbed with the povidone iodine solution (WOKADINE, WOCKHARDT TOWERS, and MUMBAI, INDIA). Standard

surgical protocol was followed. Surgery was performed under local anesthesia, Incision was given using surgical Bard Parker handle with blade no.15 and an adequate mucoperiosteal flap (Fig 2) was reflected using periosteal elevator .Two vertical releasing incision was given to have better access and visibility to the site. Using ARDS implant kit (Fig 3), Initial pilot drill was used for doing osteotomy. Next subsequent drills were used respectively and guiding pin was placed to check the angulation and position of operated site (Fig 4). An implant of size (3.75 X10mm ARDS IMPLANTS LTDhashmika St -4, Rishon LezionIsrael) was placed (Fig 5). Sutures were placed (Fig 6). Postsurgical instructions were explained to patient to control postoperative pain and an infection .Antibiotic (amoxicillin 500 mg 3 times a day) and analgesics (ibuprofen 400 mg 3 times a day) were prescribed to the patient for 7days. A post IOPA was made to evaluate the position and placement of the implant. After 7 days patients were recalled for the removal of suture.

Prosthetic Phase

After 3 months of healing period, patient was recalled for prosthetic phase. Before that an IOPA was made to make sure Osseo integration was achieved (Fig 7). A star incision is given to expose the implant site and cover screw was removed and replaced with the Healing cap (Fig 8). After 7 days Patient was recalled for making impression.There are variable techniques for taking an impression at the implant level. In this case, the impression is obtained using the open tray (direct) method which gives high accuracy.

Step-by-step, the technique of open tray direct impression.

i. Impression coping was screwed into implant
ii. X-ray was taken to confirm proper seating
iii. A plastic stock tray was chosen according patient's mandibular arch size and cutting out a window over the area of the implant to allow clearance for the implant site.
iv. A light-bodied addition silicone impression material is syringed around the fixture mount. Meanwhile, the impression tray is loaded with putty impression material and seated directly in the mouth and exactly in its place. The excess impression material should be wiped off the screw of the fixture mount before it sets (Fig 9).

Impression of the mandibular arch with the coping, bite registration, opposing arch impression, and shade of the restoration is sent to the dental laboratory.

Next step is jig trial (Fig 10) same is verified in patient's mouth, since there were no corrections required it was sent to laboratory for fabrication of metal trial.

Metal trial is done (Fig 11) and x-ray is taken to confirm seating and sent to lab for fabrication of final restoration by selecting suitable shade.

Delivering the screw-retained crown

There are various crown materials available either metal-ceramic crown or all ceramic crown, in this case we have used metal-ceramic crown.

i. The crown is soaked in chlorhexidine mouthwash for sanitization for 2 min then it is placed onto the implant and tightened with the manual screw-driver and IOPA should be made to confirm proper seating.
ii. After the adjustment of the contour and occlusion of the crown as necessary, initial torque is given and after 10min retightening of abutment screw with torque of 25Ncm was done, Teflon plug is placed into the screw access channel. The remainder of the channel is filled with composite [Figure 12a , 12b].

Patient was recalled after 3months and 6months interval of time for evaluation of implant and it was found satisfactory clinically and radiographically without any signs and symptoms of implant complication.

III. Discussion

The choice of a screw-retained versus a cemented crown is a decision that involves several points of consideration. The clinician should have good awareness regarding the advantages and disadvantages of using a screw-retained versus a cemented crown.[5] Siamos et al [6] suggested that re-tightening abutment screws 10 min after initial torque applications should be performed routinely to increase stability and decrease screw loosening. A systemic review by Sailer et al [7] on survival and complication rates of screw- and cement-retained restorations reported no statistically significant difference for the restoration survival. However, cement-retained restorations exhibited higher rates of biological complications with an increased incidence of bone loss and peri-implantitis. Based on their improved retrievability, the screw-retained prostheses were given preference, although they did exhibit more technical complications.

IV. Conclusion

In restoration of implants, there are two treatment options: Screw-retained or cement-retained crowns. Although both treatment options can be used predictably, they have their own advantages and disadvantages; known retention, retrievability, re-tightening possibility, and the risk of not leaving residual cement are the main

advantages of screw-retained crowns. Implant angulation may be a limitation to the usage of screw-retained restorations in some oral sites.

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Fig.1 CBCT

Fig.2
Incision given and flap is reflected

Fig.3
ARDS Implant kit

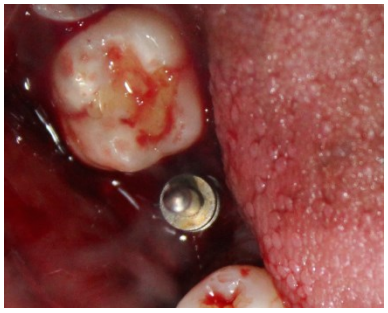


Fig.4
Guiding pin placed to check the position of site.

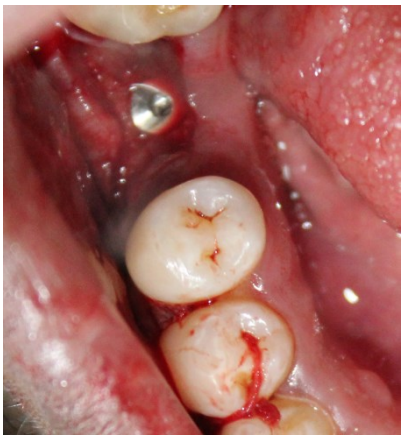


Fig.5
Implant placement

Fig.6
Sutures placed

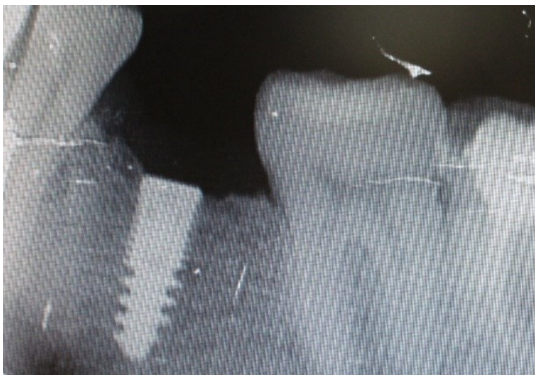


Fig.7
IOPA taken

Fig.8
Healing abutment placed

Fig. 9
Impression made using putty and light body

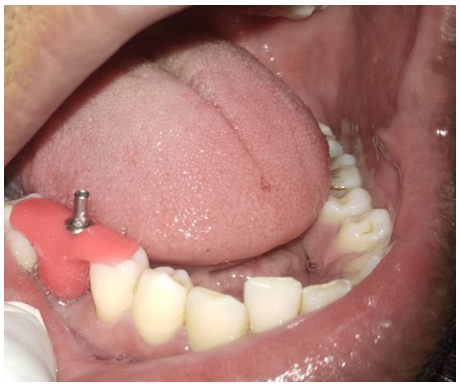


Fig.10
Jig trial checked in patient's mouth

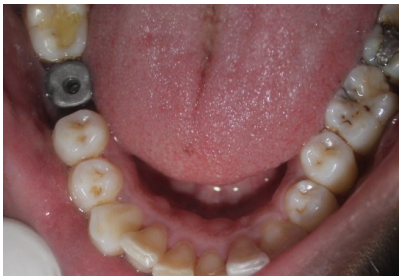


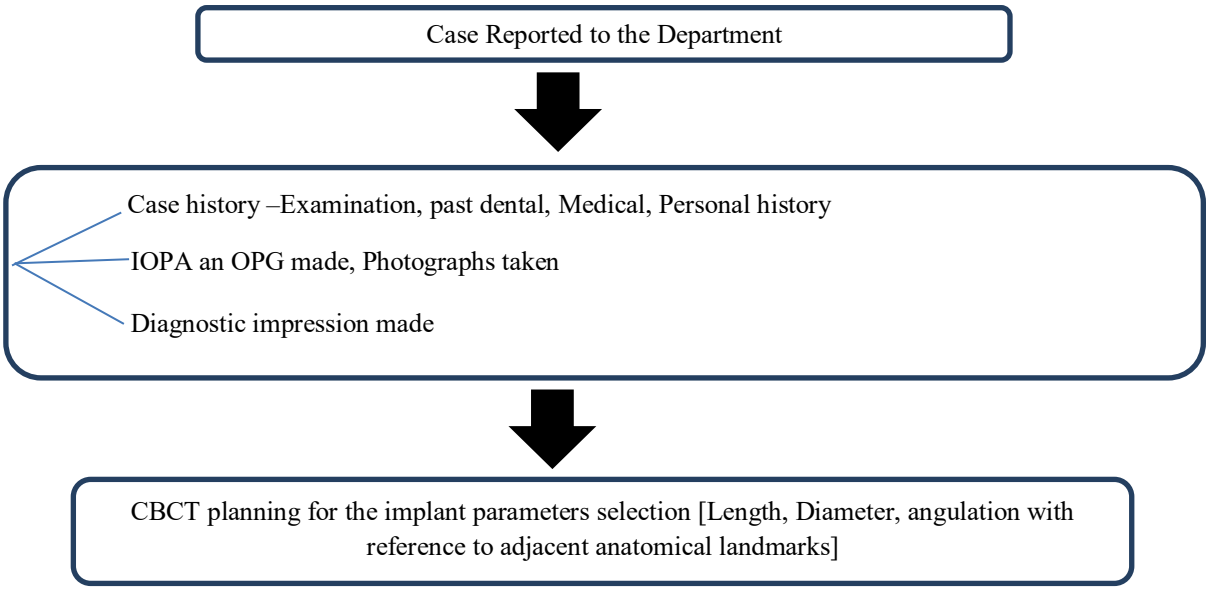
Fig.11
Metal trial

Fig.12a
Occlusal view
Final Screw Retained Porcelain fused to metal ceramic Crown

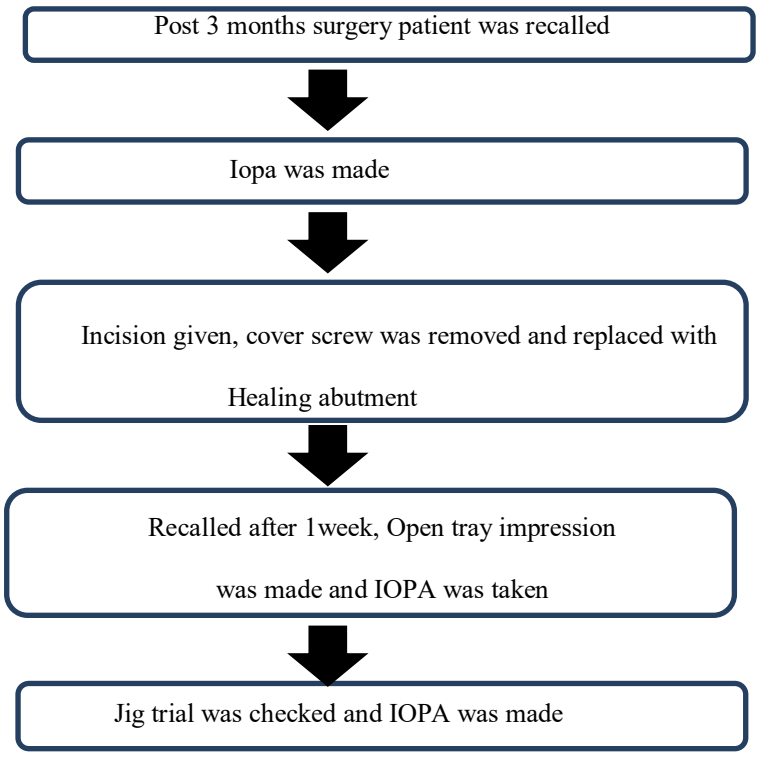
pre operative

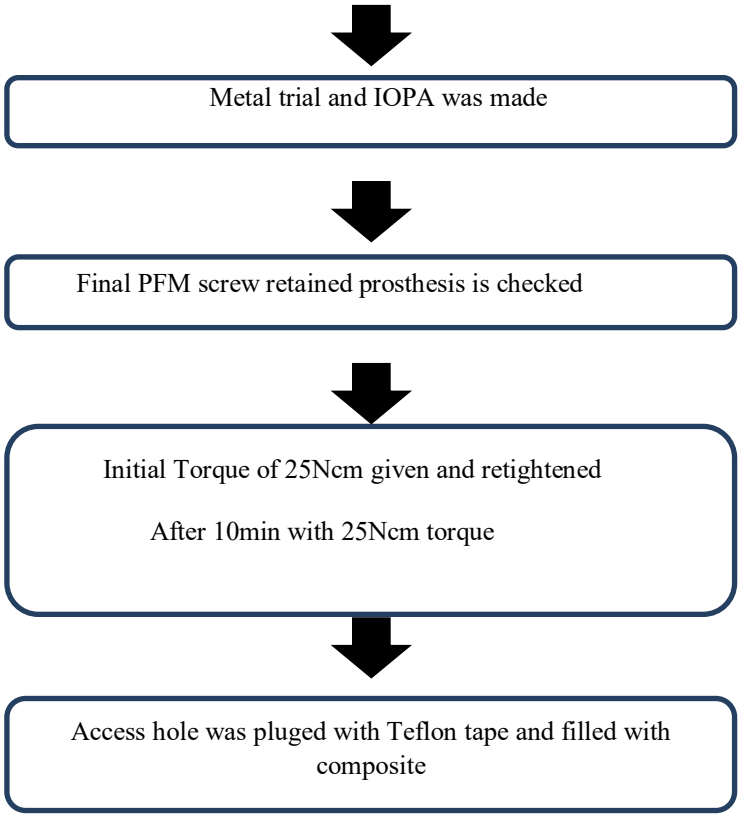
Post operative
Fig.12b
Final Screw Retained Porcelain fused to metal ceramic Crown

Flow Chart
Preoperative Planning



Prosthesis Phase





Dr. Bhavya Venkatesh, et. al. "Screw retained single implant prosthesis – A detailed Case Report." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS),* 19(5), 2020, pp. 01-08.