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IMPORTANCE OF STENTS IN IMPLANT- A REVIEW

Dr. Shanjay S.S^[1], Dr.Vijay Ebenezer^[2]

Postgraduate student, Department of Oral and Maxillofacial Surgery, Sree Balaji Dental College and Hospital, Chennai.

Professor and Head of the Department, Department of Oral and Maxillofacial Surgery, Sree Balaji Dental College and Hospital, Chennai.

ABSTRACT:-

Dental implantology is now feasible option to conventional prosthodontics^[4]. Since its inception of placing in the bone to achieve prosthetic solution that fulfils biologic, aesthetic and biomechanical requirements being a challenge. The implant site and inclination are governed by the quality of bone^[1]. In prosthetically driven implantology, where placement of implant is determined by the restoration, use of radiographic and surgical along with Computed Tomography[CT] plays a important role. A stent is used for radiographic evaluation during treatment planning for implant placement and during surgical procedures to locate optimal implant placement site. The stent with dental CT scan enables us to identify the optimal position and angulation of implant relative to occlusive load. It is advisable to establish a logical continuity between the planned restoration and surgical phases. It is essential to use a transfer device which increases the predictability of success^[2]. This article describes about the importance of placing stent in implant.

Keywords: Dental implants, surgical stent, CT scan, surgical template

INTRODUCTION:-

Despite significant advances in devices and techniques, placing dental implants in a optimal position still remains a challenge. Osseo integrated implants are a practical alternative in designing an implant supported prosthesis with function and esthetics as a challenge. Diagnostic casts, probing depths and panoramic radiographs can lead to unexpected results , as they don't provide 3 dimensional radiographic information, which is required for correct positioning and orientation of implant^[1]. Implant supported prosthesis requires final prosthesis in treatment planning stage. The use of the stent is to preview the actual restoration and relationship to adjacent structures , though very useful for the communication with the restoration. The various types of stents used include

vacuum or acrylic resin templates. The stents can be either fixed type and variable positioning type^[3]. The success of the implant therapy depends upon primarily on appropriate treatment planning and properly performed implant surgery^[2]. The success is due to the joint effort between the oral surgeon and prosthodontist. The surgical template dictates to the surgeon the implant body placement, providing the combination of 1) support for repetitive forces of occlusion 2) esthetics 3) hygiene requirements. The template should be stable and rigid when placed in correct position^[2].

DISCUSSION:-

Dental implant is used as a substitute for missing teeth in last two decades^[2]. The success depends upon the patient evaluation and treatment planning. A high degree of accuracy is essential for a successful implant placement. This can be achieved by the placement of surgical guide, fitting into either on existing dentition or on edentulous space. The mesiodistal placement of implant should aid in the preservation of papilla and provide an esthetic implant restoration profile^[1]. The implant should be placed at a minimal distance of 1.5mm from adjacent teeth and 3mm as inter-implant distance. The angle between implant trajectory and residual bone trajectory should be approximately 20 degrees. In case of multiple implant placements, non-parallel implant placement is the primary cause of subsequent implant failure^[1]. So for these, use of stent is suggested. The outer lamina is designed for use in computed tomography evaluation using radio-opaque markers. Yen Chen Ku fabricated a vacuum formed matrix filled with clear acrylic resin and a gutta-percha marker. Gutta percha is used as a radiographic marker and as surgical guide during surgical stage in single implant therapy. In the mid and late 90s, either diagnostic or surgical focussed on determining correlation of implant site with surrounding vital structures^[1]. Acka planned a method for stent fabrication in mesiodistal implant placement. The drill size can be enlarged according to increasing size of sequential drills^[1]. Gutta percha has properties of radio opaque marker, thermoplasticity and easy to compact in drill channel^[1]. So for treatment planning and implant placement, a dual purpose of surgical and radiographic technique is employed. Adrian moulded lead foil over upper and lower incisors and used lateral cephalogram to cross verify parameters^[2]. Tarlow employed use of acrylic resin duplicate denture wherein he adapted vacuum formed thermoplastic matrix over duplicate denture. Takeshita introduced radio opaque material with acrylic resin for surgical template fabrication^[2]. The radiographic stent can be converted to surgical stent after treatment planning is completed^[4]. In CAD-CAM surgical guide, the data was used from CT scan to plan implant rehabilitation. It is then converted into data being recognised by software, which further progresses from pre surgical plan to surgery site using drill guides^[2]. Depending on bone quality and implant position, the period of osseointegration of implant is between 3-6 months. Stereolithography, a recent advance, allows fabrication of surgical guides from 3D computer generated models for precise placement of implants^[2]. If extended antero posteriorly, covering enough area over the teeth, the incidence of stent displacement is minimized^[3].

CONCLUSION:-

Identification of bony anatomy with respect to teeth allows clinician to place implant where implant bone interface is maximized and prosthetic result is optimized^[2]. If each step is followed precisely, it is easy to install an implant in terms of position and diameter^[3]. When implant position is to be precisely executed, and its safe placement to the planned site, A computer guided planning and image guided surgery is carried out. Stents help in achieving precise position for implants. The radiographic and surgical stents can be used by inexperienced surgeon to achieve desired results^[4].

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