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A LITERATURE REVIEW ON VARIOUS FACTORS ASSOCIATED WITH FAILURE OF THE IMPLANT

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Abstract:-
Implant dentistry is the science which is concerned with the diagnosis , restoration and management of autogenous or alloplastic structure to restore the contour, function, esthetics, speech of the patient , which is partially edentulous or fully edentulous. Now a days implant treatment is turning into a popular as well as promising treatment option in the replacement of partially edentulous and completely edentulous patient. Implant is a prosthetic device, made up of a material, which is alloplastic in nature and is found to be the prime most treatment option in the replacement of missing tooth or the teeth in the oral cavity. With the growing era of implant dentistry in todays time, failures along with complications of the implant has also become so common. The main objective of this article is to review the different etiological factors that might lead to failure of the implant.

Keywords : - Implant dentistry, implant failure, complications related to implants, osseointegration, peri implantitis, bone loss, alloplastic material.

Introduction : -

The condition of edentulism leads to the impairment of the normal physiological function, which is having a direct consequences over the general health of the patient. There are different prosthetically driven option in the replacement of the missing tooth or teeth in the oral cavity, like removable partial denture, traditional fixed dental prosthesis, resin bonded prosthesis, cast partial dentures, and implant supported prosthesis. With the option of the implants, it provides an

advantage over the traditional fixed dental prosthesis, in which unnecessary preparation of the adjacent tooth can be avoided. Rehabilitation of edentulous space with the help of implants, reported high success rate for single as well as multiple implants. With the advantage of high success rate of implants , failures are also common . complications as well as failures of the dental implants are interconnected with each other , but adequate pre operative examination can reduce the chances of implant failures and complications.

In pre operative examination, it includes blood investigation of the individual, to find out any systemic condition that might affect the prognosis of the implant prosthesis, it also includes availability of the bone in terms of bone height, bone width, type of bone, personal habits like smoking. According to Truhler, implant failures can be broadly classified in to early and late implant failure. Early implant failure can occur with in weeks or in initial months.

Some causes that may lead failure of implant are, over heating of bone during the process of osteotomy preparation, contamination at the surgical site, trauma to the surrounding alveolar bone and to the soft tissue, during the process of implant placement, when the bone quality is not good in the patient, infection around the implant, bad oral hygiene, occlusal trauma, periimplantitis and over loading of the implant, improper selection of the patient, improper prosthetic final restoration given over the implant, may lead to failure of the implant [1-5]

Various criteria's that can help in evaluation of implant failure:-

Infection occurs during the early stage of implant placement, and if infection occurs in the early stage of implant placement, it will disturb the process of osseointegration of the implant to the alveolar bone. Signs of early infection includes, swelling in the area where implant has been placed, pain at the site of implant placement, appearance of fistulas near the implant site. According to Mombelli et al , implant site with the failing implant is characterized by a probing depth of more than 6mm or greater than 6mm along with the suppuration, bone loss is present, with microorganisms mostly constituted of gram negative anaerobic rods.

Patient also complaints of pain and discomfort in the site where the implant has been placed, some time pain and discomfort is also associated with mobility. There are different types of mobility can be seen with the implant which is failing, like rotational mobility, lateral mobillity , and vertical mobility . radiographically it can be diagnosed by a thin radiolucent line surrounding the entire implant. This radiographic sign suggest that there is absence of direct bone to implant contact, that might lead to loss of stability of the implant . others sign can be increased marginal bone loss around the implant . when there is absence of clear crystallization sound and presence of subdued sound over the percussion. Presence of bleeding on probing , is characteristic of soft tissue health surrounding the implant. If bleeding on probing is present , it indicates chances of infection near the implant[14,15].

Various factors associated with the failure of implants : -

Surgical condition : -

Maintaining a clean and sterile surgical field is the prime most concern while performing an implant surgery , a sterile surgical field has its own crucial role in the success of any surgery . instruments which are not sterilized , contaminated gloves , touching the surfaces which are not sterilized at the time of implant placement , can lead to the chances of implant failures . it can be avoided by using sterile gowns , sterilized instruments , application of antiseptic solution overt the surgical site as well as over the peri oral area and asked the patient not to touch any oral and peri oral area after the application of the antiseptic solution and after wearing the sterilized gowns. Whole procedure of implant placement and all the armentarium which is used in the placement of the implant should be sterilized properly to avoid the chances of infection, that can ultimately leads to the failure of the implant[7-12].

General health of the patient : -

General health of the patient plays an important role in the success of the implant prosthesis, conditions like diabetes mellitus and osteoporosis are majorly concerned with the success of the implant procedure. Diabetes mellitus impairs with the wound healing , same way it also impairs the bone healing following the placement of the implant. Different studies stated that implant failure rate is much higher in a patient having diabetes as compared to a non diabetic patient . on the other hand only uncontrolled diabetes condition is contraindicated in the placement of the implant. Other condition like ostoporsis is contraindicated in the placement of the implant , as in condition like osteoporosis, osseointegration of dental implant can not be achieved [3].

Smoking : -

Smoking is found to be the prime etiological factor in failure of implant . smoking is also found to be the etiological factor in the development of gingivitis , periodontits and oral cancer. In relation to implants, smoking results in constricted vascularization near the implant site, leading to decreased vascularity in the alveolar bone , leading to the failure of the implant. To achieve the implant success rate, it is advised to the patient to stop the habit of smoking before the surgical phase of the implant placement and this protocol should be maintained atleast two months after the placement of the implant , so that the process of osseointegration should not get hampered and implant get osseointegrated properly[2 -7] .

Characteristic of the implant : -

Short implants with unfavorable crown to root ratio are more prone to failures. In the same way implant with small diameter are not able to withstand stresses , that results in fracture of the implant components . implants with surface treated are having rougher surface and shows better success rate in terms of osseointegration and survival . implant success rate also depends on type of bone availability. Implants are best ossointegrated in D1 and D2 type bone, as compared to D3 and D4 type bone. Although they get osseointegrated in D3 and D4 type bone, If proper surgical protocols are maintained and the time for osseointegration should be increased form three to sixth months[1-6].

Radiation exposure : -

If the patient is having previous radiation exposure in the oral and maxillofacial region for the treatment of the oral cancer, result in the endarteritis of the vessels resulting in constricting the flow of the blood vessels in the surrounding alveolar bone which ultimately results in reduced chances of osseointegration of the dental implant with the surrounding alveolar bone and increased chances of implant failure. Hyperbaric oxygen therapy has been proposed in case of previously irradiated implant that too especially in the region of maxilla and zygoma[7-9].

Age : -

Age plays an important role in the osseointegration process of the dental implant . it has been known that patient with increased age has more chances of developing systemic problems . But on the other hand no scientific evidence has been observed and it shows no co relation between the old age of the patient and failure of the implant[5-8].

Iatrogenic factors :-

Iatrogenic factors include like over heating of the alveolar bone during the process of osteotomy preparation, due to non usage of coolant solution results in failure in the process of osseointegration in the first three months after the implant surgery . Bone necrosis also can occur if bone is heated more than a temperature of 47 degree Celsius for one minute . To avoid this one must use proper irrigation solution while the procedure of implant placement and drills at low speed to reduce the generation of heat[10-12] .

Lack of communication between the implant patient and dentist. Once the implant surgery has been done , there should be a proper and routinely communication between the dentist and patient , to

ask everything is normal, is there any problem, routine check up for the implants results in reduction of the failure rate of the implant[12 - 19] .

Conclusion : -

Before planning the implant prosthesis , one should properly go through the diagnosis and treatment planning for the patient . So to avoid any complicatios related to the implant and increase the chances for implant success rate.

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