



THE EFFECT OF HEAT ON OSSEOINTEGRATION IN TWO STEPS DENTAL IMPLANT.

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ABSTRACT

A dental implant is a device of biocompatible material placed within or against the bone to provide additional or enhanced support for a prosthesis. when placed in a suitably prepared site with in the bone, could become fixed in place due to a close bond that developed between the the bone and fixture .The aim of this study is to determine the effect of heat on osseointegration. This study is include 80 cases of dental implant of two steps(surgical step and prosthetic step)between May 2014 to April 2017. All the recipient site prepared without irrigation only depending on oozing from the recipient site, one case (1.2%) presents with radiolucent region surrounded the implant in the anterior region of maxilla in healthy young male, that mean the heat generation during slow drilling has no significant effect on the osseointegration.

KEYWORDS: osseointegration, dental Implant.

AIM OF STUDY

To determine the effect of heat on osseointegration.

INTRODUCTION

A dental implant is a device of biocompatible material placed within or against the bone to provide additional or enhanced support for a prosthesis.^[1] The use of implants has increased as dentists have recognized the predictability and long-term success of new dental implants. Implants avoid the indication for preparation of adjacent healthy teeth and also avoid the social embarrassment of wearing dentures.^[2]

when placed in a suitably prepared site with in the bone, could become fixed in place due to a close bond that developed between the the bone and fixture, a phenomenon that he later described as osseointegration (OI).^[3] A number of local factors has been considered as being associated with the production of an osseointegrated interface:fixture material, surface composition, heat generation, bone quality, initial stability And early or late loading.^[4]

Heating of bone to a temperature in excess of 47°C during surgical procedure can result in cell death and denaturation of collagen. As a result, osseointegration may not occur; instead the implant becomes surrounded by a fibrous capsule. In general, slow drilling and the use of copious amounts of coolant are recommended.^[5]

MATERIAL AND METHOD

- 1-This prospective study is include 80 cases of dental implant of two steps(surgical step and prosthetic step)between May 2014 to April 2017.
- 2-Our implant system from dentium company, Korea
- 3- The cooling during surgical preparation of recipient side depending on the oozing from preparation site only.
- 4-Drilling speed is 1000 rpm
- 3-All the patients have primary stability.
- 4- All the patients have follow up.

RESULT

This study is include 80 cases :60 male(75%) and 20 female(25%) table1,between 17years - 55 years ,most of the patients between 30-40years old table 2, all the recipient site prepared without irrigation only depending on oozing from the recipient site which take the temperature of the body, one case only presents with radiolucent region surrounded the implant in the anterior region of maxilla in healthy young. 20 cases need to adjustment of the abutment while inserted to the fixture in oral cavity with heat generation, but no one fail.

Table (1): Sex distribution in dental implants.

Sex	No.	%
male	60	75%
Female	20	25%
Total	80	100%

Table(2): Age distribution in dental implants.

Age /years	No.	%
10-20	12	15%
20-30	10	12%
30-40	36	45%
40-50	12	15%
50-60	10	12%

DISCUSSION

In this study 75% are male because this belonged to people education, that most of females afraid from the operation, the problem that encourage us to prefer the flapless technique that characterized by less time and without suturing. Also some patients indicate for dental implant due to maxillofacial trauma (sport injury, fight injury, fall from height...etc.) which highly occur in male. In this study 1 case out of 80 (1.2%) was fail may be due to heat generation or otherwise, depending only on the oozing that take the body temperature to prevent the over heating. Trisi et al found no difference in OI between overheat (50° C) and control group (40°C) for 1 minute.^[6] The cancellous bone has well blood supply therefore dissipates the heat higher and has a greater ability for regeneration than cortical bone. In this study the use of flapless technique or immediate insertion of fixtures after extraction maintain the blood supply to the cortical bone for cooling and replacement the necrotic zone at the cortex by maintenance the cellular and vascular elements of the bone.^[7] Osteocyte regarded as multifunctional cell has the ability to response to protein signaling after mechanical stimulus.^[8] the osteocytes are capable of regulating bone degeneration and regeneration while they are vital and even they are dead.^[9] Therefore an increase in the expression of these proteins signal after tissue injury result in new bone formation and enhance the osseointegration. Also the using of slow drilling such as 1000 rpm regarded as important factor to avoid overheating and enhance the osseointegration.^[5]

CONCLUSION

The heat that generate during slow drilling has no significant effect the osseointegration.

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