Utility of Trephine Drills in Implant Dentistry

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Abstract

Introduction The aim of this technical note was to compare the primary stability and less bone drilling with the help of conventional and trephine drills.

Materials and methods 40 patients were divided into two groups (I & II) of 20 each and group I patients treated with conventional drills and group II with trephine drills. The patients who were reported to dental clinic and research centre between Jan 2011 to June 2011 and who required their teeth replacement with the help of dental implants were included in the study and patients with diabetes, Arthritis and smokers were excluded from the study.

Conclusion Trephine drills provide better primary stability and good long term results.

Keywords Trephine drills · Bone preservation · Primary stability

Introduction

Proper angulations and bone preservation while preparing the osteotomy site for implant placement is mandatory for

the successful and long term success of implants [1]. Drills should be used in such a way that excellent primary stability is achieved. The aim of this technical note was to evaluate the effectiveness of trephine drills in preparation of osteotomy for dental implant recipient site. Trephine drills are used very frequently in implant dentistry now-a-days. In order to preserve the bone during osteotomy we also recommended the use of trephine drills (ARDS implants St. Rishon Le- Zion, Israel) instead of conventional drills.

Procedure to Use Trephine Drills

Under copious external or internal irrigation and at 750–1250 rpms depending on the type of bone [2], first the pilot drill of 2 mm diameter (Fig. 1) is advanced to a depth up to the length of the implant to be placed, followed by placement of guiding pin (Fig. 2). The length of the guiding pin is 16 mm, the markings were present over both guiding pin and trephine drills. Over this guiding pin the trephine drills were used up to 5.5 mm length with the diameter of drill being one less than the original diameter of the implant to be placed (Fig. 3). The final preparation of the osteotomy is shown in Fig. 4.

The trephine drill used up to 5.5 mm length due to design of the implant (Fig. 5) because the smart implant uses two different thread types, double thread thin grove at the implant interface area for the cortical bone i.e. up to 5.5 mm length and single thread thick grove for the cancellous bone, which is capable of drilling the bone while tightening the implant in the cancellous bone. This unique design allows facilitating the transfer of occlusal forces to the greatest surface area of the bone-implant interface for favorable load distribution. Also it reduces

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Fig. 1 Photograph showing use of pilot drill

Fig. 3 Photograph represents placement of trephine drill over the guiding pin

Fig. 2 Photograph showing placement of guiding pin

Fig. 4 Final osteotomy prepared with guiding pin insitu

the amount of bone removed by using a novel drilling procedure.

Difference Between Trephine and Conventional Drills

The length marking over both the conventional and trephine drills were at the same level i.e. first at 5.5 mm, second at 8 mm, third at 10 mm, fourth at 11.5 mm and last at 13 mm. During the use of conventional drills if the length of the implant is 8 or 10 or 11.5 or 13 mm, the osteotomy is to be prepared up to the same length.

In case of trephine drills the only 5.5 mm length is prepared and only the pilot drill is used up to the length of

Fig. 5 Diagram showing bone preservation with the use of trephine drills

Fig. 6 Photograph showing
Implant design

the implant to be placed. The diameter of the trephine drills are 2.8 mm for 3 mm diameter implant, 3.6 mm for 3.75 mm implant, 4 mm for 4.2 mm implant and 4.2 mm

for 4.5 mm implant. Trephine drills are hollow from inside and guiding pin is mandatory for the use of trephine drills.

Advantages of Trephine Over Conventional Drills

1. Trephine drills saved more than 40 % of the bone during the osteotomy preparation at the implant placement site (Fig. 6).
2. Time saving.
3. Causes minimum trauma to the bone.
4. Easy to use.

References

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