CORTICAL BONE SPREADER OSTEOTOME AND METHOD FOR DENTAL IMPLANT PLACEMENT

Dennis Flanagan, DDS

This article describes an osteotome designed for placement of dental implants in narrow sites with less dense bone.

KEY WORDS
Dental implants
Osteotome technique
Cortical spreading

INTRODUCTION
Osteotomes are well documented for use in placing dental implants and ridge expansion.1–4 There are various techniques and indications for their use. The advantages of an osteotome technique that compresses bone include an increase of bone density rather than removal of vital bone, an increase of the resulting bone-to-implant contact area, and an enhancement of initial implant stability. There are several osteotome designs that perform a specific function. This article describes an osteotome for use in less dense bone, types 3 and 4 and some type 2 bone (Figure 1). It should not be used in type 1 bone without site preparation. It can be used in narrow ridge sites where the bone is of lesser density and the surgeon is well aware of the contour of the underlying bone and anatomical structures such as the maxillary sinus and mandibular nerve bundle.5,6

OSTEOTOME*
This device is used to prepare a site for installation of a dental implant in limited situations. It is especially useful in narrow atrophic bone ridges. It spreads cortical bone and opens a round portion to accept the dental implant (Figure 2). The instrument is 5 mm wide and the rounded portion is 3.2 mm in diameter. The flat portion faces the lingual. The chisel portion at the tip spreads the cortices. The rounded central portion then engages the cortices as the instrument advances and separates them gradually to create an opening in the bone to accept a standard 3.75-mm-diameter cylindrical dental implant. The tapered design causes a gradual spread of the bone in such a way as to minimize fracture and encourage stretching of the cortices. The width is appropriate for interproximal bone length minimum availability of 7 mm. The handle has a flat end to allow a surgical mallet strike and retro strikes with a forceps for removal (Figure 3). It is made of stainless steel and is fully autoclavable.

METHOD
The procedure for use is simple and straightforward. The proposed site is inspected and measured for sizing of the implant by means of study casts, ridge mapping, palpation, and radiologic study. A short full-thickness type incision is made with a #15 scalpel at...
BONE SPREADER FOR IMPLANT PLACEMENT

FIGURE 1. Osteotome tip.
FIGURE 2. Osteotome, side view.
FIGURE 3. Osteotome, handle end.

The tip of the bone spreader is then inserted in the resultant slot at the ridge crest with the flat side facing toward the lingual. A surgical mallet is then used to gently and slowly tap the spreader into the bone to encourage spreading to minimize fracture of the bone tissue. Again, the instrument must not be allowed to wander off course, but follow the pressures of the cortical plates, which should guide the blade into the cancellous bone. Time increments of up to 1 minute between osteotome advancements may be necessary to allow the bone to relax and minimize microfracturing. The tip of the bone spreader is then inserted in the resultant slot at the ridge crest with the flat side facing toward the lingual. A surgical mallet is then used to gently and slowly tap the spreader into the bone to encourage spreading to minimize fracture of the bone tissue. Again, the instrument must not be allowed to wander off course, but follow the pressures of the cortical plates, which should guide the blade into the cancellous bone. Time increments of up to 1 minute between osteotome advancements may be necessary to allow the bone to relax and minimize microfracturing. The instrument then is not luxated but removed directly in reverse with a gentle manual pull or, with an assistant, grasping the end with a forceps and gently tapping the forceps with a surgical mallet to remove the instrument.

A standard sized 3.75-mm-diameter implant is then immediately placed into the site in the usual fashion. Osseointegration and initial stability of the implant may be enhanced because of the increased bone-to-implant contact. Some apical drilling may be necessary in some sites to create appropriate space for the selected implant. It must be kept in mind that initial implant stability is paramount. A circumferential suture is placed to compress the gingiva against the implant top. The patient is then covered with appropriate medications.

CONCLUSIONS

There are many different osteotome designs that perform specific functions for dental implant placement. This particular osteotome design may allow quick and easy placement of standard-sized implants in narrow ridges with less dense bone.

REFERENCES