

Mini Dental Implants for Every Dentist



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In this article, I will discuss the exciting world of mini dental implants, from their benefits and limitations to their indications and contraindications. I will also present a case study that covers the surgical placement of “minis” in the edentulous mandible, as well as prosthetic protocols for the patient.

Introduction

Since the 1980s, conventional implants have drastically changed the way we practice dentistry. Mini implants are just as their name implies — a smaller version of conventionally sized implants. They are made of the same material, and they have the same design and surface treatment. Everything about them is virtually identical, except for their size. In the coming years, I am very excited to see how much more we will be able to do with mini implants.

Benefits of Mini Implants

A primary benefit of mini implants is their minimally invasive surgical protocol. As you will see in the case study that starts on page 20, you only need to take a small pilot drill and go through the soft tissue until you touch the bone. Then you start drilling in order to get through the superior cortical bone of the ridge. As soon as you tap through that ridge, stop drilling.

That's all there is to the surgical protocol for mini dental implants. It truly is minimally invasive, and there is hardly any postoperative discomfort and soft-tissue healing due to very minimal bone drilling. Even patients who are medically compromised can tolerate this process, whereas they could not tolerate the vigors or the invasiveness of conventional implant surgery.

A second benefit of mini implants is that they can be immediately loaded. This means that on the day the implants are placed, they can be activated and the case can be loaded. In most lower edentulous mandible cases, implants can be placed and loaded in a single treatment session, which shortens the overall treatment duration and minimizes patient discomfort.

A third, and perhaps the most important, benefit of mini implants is their affordability. Very often, the treatment cost of mini implants is a fraction of that of conventional implants. Many patients who would not be able to afford

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conventional implant treatment, especially in this tough economy, will be able to benefit from mini implants because of their affordable cost.

Limitations of Mini Implants

Because FDA approval of mini implants only came about 11 years ago, no long-term studies are available. The long-term outlook of mini implants currently is not well known. However, there are many short-term — five- to six-year — studies available, which state the success rate of mini implants is quite comparable to that of conventional implants. In time, I believe there will be some good long-term studies to validate the clinical efficacy of mini dental implants.

Indications of Mini Implants

Lower edentulous cases — patients who are wearing loose lower dentures — are the number one indication for mini implants. University of the Pacific School of Dentistry published a study in 2008 in which more than 600 small-diameter implants were placed. Over the study's six-year period, a 92.6 percent success rate was achieved. With a university study like this, I think it is safe to say that lower edentulous cases can be routinely helped when treated with mini dental implants.

Of course, any removable prosthesis can be stabilized using mini implants. This includes upper dentures — although protocols are slightly different — and partial dentures, as well as stayplates.

Another indication of mini implants is the fixed application. Yes, you read that right: fixed crown & bridge applications. Many dentists have been doing crown & bridge applications on minis and have had success. Yes, they

are smaller, and we have to be a little more cautious in using these implants in areas where there are a lot of heavy functional and parafunctional forces. But this is one area you will see more from. For now, they should be performed in areas where there are limited mesial-distal spaces and buccal-lingual bone width.

Contraindications of Mini Implants

Because mini implants are simply a smaller version of conventional implants, all the contraindications we know of for conventional implants apply to minis as well. Although the minimally invasive surgical protocol of minis allows us to help a lot of people who could not be helped with conventional implants, we should be cautious, as I stated

above, about using minis in areas under heavy functional and parafunctional forces.

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Case Study:

Surgical Mini Implant Placement for Edentulous Mandible



Figure 1: Edentulous mandible with resorbed alveolar ridge



Figure 2: Implant sites marked with dye



Figure 3: Pilot hole drilled through the cortical plate



Figure 4: Implant delivered to prepared site



Figure 5: Implant advanced with finger driver



Figure 6: Implant advanced with winged thumb wrench



Figure 7: Final seating with torque wrench



Figure 8: Implants in situ

The patient in our case study has been edentulous for many years. There is hardly any mandibular ridge left (*Fig. 1*).

First, locate the mental foramen through manual palpation. Once you locate the mental foramen, mark the ridge with an indelible pencil. Measure 7 to 8 mm anterior from that location, and that will be the most distal implant position. As you can see, I have planned to place four minis between two mental foramina (*Fig. 2*).

Then, take a very thin pilot drill and go through the soft tissue until you feel the bone (*Fig. 3*). Once you feel the bone, step on your rheostat and the drill will go through the superior cortical layer. This can take a few seconds, but when it goes through you will feel a change in density because the drill drops more easily into the cancellous bone. At that point, stop drilling. In most cases, that is the extent of drilling I recommend.

Next, carry the implant into that site (*Fig. 4*). You will start the insertion process using a series of hand instruments. Establish the direction of the mini implant with the first driver and slowly insert the implant into place (*Fig. 5*). As you go farther, you will encounter more resistance because of the dense bone. This is a good time to change out to other hand instruments that can deliver a higher torque (*Figs. 6, 7*).

Once the implants are in place (*Fig. 8*), measure the resistance torque of the implants with a torque driver and determine if the implants can be loaded immediately. As far as the surgical placement of the implants, this is pretty much it. Afterward, there is hardly any bleeding because we really haven't made any incisions or raised a flap. It is truly a simple and minimally invasive procedure.



Figure 9: Bite registration using existing prosthesis



Figure 10: PVS material applied to tissue surface of denture to identify implant positions



Figure 11: Relieving existing denture



Figure 12: Receptor sites to accommodate metal housings



Figure 13: Block-out shims covering the head of each implant



Figure 14: Metal housings placed over the implant heads

Prosthetic Mini Implant Protocol for Edentulous Mandible

Now, let's discuss prosthetic protocol for a loose lower denture using mini implants. Before you begin surgical placement, you will take a bite registration of the upper and lower dentures intraorally (*Fig. 9*). This will become very useful after you place the mini implants.

Then, find any really fast-setting chairside material. This could be a bite registration material, PVS, chairside relining material, soft relining material, Fit Checker — anything that sets fast. You'll load that material onto the tissue side of the denture (*Fig. 10*), and then seat it in the patient's mouth. Take it out after a couple minutes and you will see holes corresponding to the locations of the O-balls of the mini implants you've just placed.

Next, score into your plastic — the tissue side of the denture — with some kind of a drill (*Fig. 11*). These holes will then be enlarged at the laboratory, until they are big enough to be seated passively over the mini implants and metal housings



Figure 15: Pick-up material placed in relieved areas



Figure 16: Block-out shims removed after pick-up of metal housings



Figure 17: Metal housings with retentive O-rings



Figure 18: Proper occlusion verified

in the patient's mouth (Fig. 12).

Before you finalize the process, put a plastic shim over the shoulder of each mini implant to prevent locking of the denture when you do the chairside pickup (Fig. 13). After doing that, put on the metal housings of your choice (Fig. 14). Make sure the denture fits completely passively over the metal housing-implant complex. The vertical dimension and occlusion should also be confirmed.

Once that is done, take a dimensionally stable chairside hard reline material and load it into the holes you just created on the tissue side of the denture (Fig. 15). Take it to the patient's mouth and have the patient bite at the centric using the bite registration that you took at the beginning of the procedure.

After seven to 10 minutes of setting time, remove the prosthesis from the patient's mouth. Make sure you remove the shims from the patient's mouth as well (Fig. 16). After the prosthesis is cleaned up and polished at the laboratory, it is ready to deliver to the patient (Fig. 17).

The patient should be given postoperative instructions. Generally speaking, patients should be told to keep the denture in place for the first 24 to 48 hours (Fig. 18). A follow-up appointment should be scheduled for the patient to come back in a week or two-week period.

Conclusion

As you just read, the placement of mini implants is a simple process that is affordable for the patient and relatively stress free for the clinician. Every clinician should take proper implant training courses before he or she starts placing mini dental implants. Once you start doing them, I think you will really enjoy placing mini implants, and your career and practice will never be the same.