

Midi Placement Procedure

Notes:

Special placement criteria in anterior mandible

Note: All placement considerations out-lined in procedural manual apply to placement of Midi implants. The following are additional requirements that are necessary in anterior mandible.

1. Take Cephalometric or large film AP radiograph of anterior mandible profile.
2. Place Pip paste dot at start point for implant to transfer location to underside of seated denture. It will show where to remove denture acrylic for implant ball clearance.



3. Clean ridge site of Pip paste dot and after complete infiltration anesthesia and ridge top tissue, create a full thickness incision along the top most of ridge crest as necessary.

4. Flap buccally and lingually exposing bony ridge anatomy and its direction. Flatten ridge as necessary to encapsulate implant diameter sufficiently. Use stainless sterilized fissure burs with adequate external irrigation.



5. Drill pilot drill channel $\frac{1}{2}$ to $\frac{3}{4}$ the length of the midi implant chosen. The direction should be as the AP radiograph and physical bone exposure dictates.



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- Next use 2.3mm sizing drill along pilot drill channel.



- External irrigation is necessary to keep bone as cool as possible to minimize bone cell death.

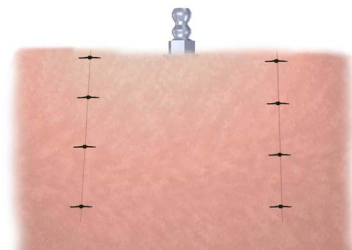
- Carry implant to site and begin initial placement by hand tightening.



- VERY SLOWLY ratchet midi implant to place utilizing the ratchet wrench atop the rotational midi driver instrument. Keep in mind the tissue thickness when rotating implant to place. One may have to reduce flap width slightly to compensate for any crestal bone flattening. ALWAYS leave keratinized tissue about implant.



- Suture flap back in place around implant.



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11. Remove enough denture material around dot to allow for complete denture seating under pressure with no acrylic coming in contact with ball of implant top.



12. Treat acrylic and fill defect with soft denture reline material and reseat denture with full closure and hold with very mild occlusal pressure for initial cure for 5 minutes.

13. Remove from mouth and trim if necessary and finish to complete cure in warm water. Be certain no soft material has become lodged beneath the sutured tissue borders.

NOTE: Wait for 2 months before thinking about placing O-Ring caps and O-rings into denture.

These are “real” implants and reasonable osseointegration time in D-1 bone must take place.

The soft reline step is possibly the kindest to the integrating implant body and may exert the least amount of micro-movement potential. Warn the patient to be very careful when removing and especially seating the denture around the “new” implants so that the soft material will remain conformed to the nipple top and not distorted.



The BASIC Midi Series Implant

The BASIC Company developed our Midi series implant to meet two criteria:

1. In sufficient and acceptable bone the 3.5mm standard Omni-Tight™ implant is often used for removable prosthetic retention and uses our cementable ball post abutment. However in some situations where bone volume can be deficient the Midi is very useful and appropriate.
2. Secondly, the Midi was engineered to be strong for its size and therefore be potentially applicable in other prosthodontic situations where existing bone site volume is an issue.

In the opinion of Dr. Gordon Christensen, “In many instances there is not enough facial-lingual bone available for the placement of standard size implants.”

It is well understood that not having normally sufficient facial-lingual bone volume present will result in two major implant problems:

1. Physical stability of the implant body could well be at risk
2. Without at least 1.5-2mm of viable bone present on the facial and lingual aspects of the implant channel there could exist an inadequate blood supply to begin and foster osseointegration resulting in fenestration and implant loss.

Dr. Christensen continues, “in his opinion only a few patients desire to have or can afford bone grafting.” He goes on to say that “smaller diameter implants have the potential to assist in this challenge.”

As in all of treatment dentistry the doctor must use good judgment. The same is true when contemplating Midi utilization. Our Midi series falls between the popular mini implants and our smallest standard implant. We wished to continue strength and surface osseointegration area in a smaller implant fixture both for removable prosthetic retention and compromised bone site volume.

Our aggressive strength testing of the Midi was remarkable in its findings. So it appears quite durable when utilized in logical procedures:

- A. Overdenture retention procedures in which certain bone dimensions preclude standard diameter implants.
- B. In certain RPD situations when distal free end saddle extensions would benefit from implant helped retention.

Note: In the foregoing examples it must be understood that sufficient numbers of implants are to be utilized for force distribution that will help maintain osseointegration of the fixtures and the bone must be acceptable, the patient healthy and without untoward habits of on oral or psychological mature.

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- C. And thirdly a Midi may be considered for use in acceptable single tooth replacement situations where standard size implants are precluded due to facial-lingual bone volume limitation, or when mesial-distal site space is compromised, or root angulations dictate a narrower implant body for safety. It is also to be understood by the doctor that in these possible options for the Midi, the final prosthetic must be protected with good and functional adjacent dentition so that malocclusion or destructive occlusal habits be non-existent.

It is necessary that the proposed patient be fully informed that a narrower implant is being offered because of their pre-existing implant site deficiency. Because of this, a somewhat higher risk of failure is possible. On the other hand, non-use may be destructive to existing teeth, and loose and uncomfortable prosthetics will remain and considerable more expense and discomfort could be necessary to rectify the existing condition in another fashion. ie: bone grafting and or orthodontics.

Let's now proceed to Midi placement. First in the anterior mandible for complete over-denture and RPD retention.

In essence all of the “who” and “when” requirements in diagnosis for success in the standard Omni-Tight™ BASIC implant protocol still holds true for the BASIC Midi series. How we arrive at the “when” however differs in that only rarely is the Model Tomographic of the anterior mandible utilized in the Midi protocol. Rather the lateral cephalometric or small anterior profile radiograph is made while the patient is seated in an upright position with the Frankfort plane being parallel with the floor. The resultant radiograph or digital picture will relate an accurate though magnified transverse view of the anterior mandible or maxilla resulting in useful facial-lingual ridge direction information. In addition digital palpation of the flap exposed bone at the time of surgery is also necessary.

The “how” of the placement protocol also differs substantially in that the 3-D drill guide stent is not normally utilized due to dentition absence in the overdenture procedure. Usually a form of crestal ridge incision is required resulting in a double flap allowing for complete ridge bone viewing and attention. Often the ridge top will include a sharp elevation that will need removal and smoothing before implant placement. Full viewing also is necessary for free hand channel drilling for several strategically placed Midi or small diameter Omni-tight™ implants depending on the resultant ridge width. This is exactly why we strongly recommend becoming comfortable with placing single tooth replacement implants first before dealing with double flaps, ridge bone removal and flattening, free hand channel creation for multiple implants all the while being very aware to stay completely away from the lingual cortical plate. Also we must now depend on adequate (lots) of external irrigation in all aspects of the procedure in order to keep the drills and bone cool. The locked wrist is also extremely important when free hand, up and down drilling action is occurring. Two plane angulation awareness at all times when pilot channel drilling is crucial. Furthermore one must always stay bone anatomy conscious both by feel and sight so that lingual misdirection does not occur. Thus it is

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not a good idea to begin ones journey in implant placement by starting out in the anterior mandible or even anterior maxilla.

Now having said all of this, why would a doctor want to do this procedure? Here's why – It's a great benefit for the patient who has suffered along for years with lack of retention of the RPD or denture. What a joy to be able to offer this treatment option to these patients. And truly you will be able to accomplish the treatment successfully by staying on protocol, taking your time, preparing well and importantly having a good comfort level with single tooth replacement implant procedures. As for your first single implant case, your first anterior mandible case should be for an excellent patient that is healthy, robust, and exhibits a good anterior bone conformation. Begin like this and you and your patient will be well served.

Let's now examine a typical Midi denture retention procedure:

1. First by a written segmental run through of the normal steps
2. Second by demonstration on a model
3. Third a live placement

A. Midi procedure in sequence – full denture retention

1. Diagnostic Procedures
 - a. Interview patient – gauge interest and appropriateness
 - b. Review orally health history – written history later
 - c. Oral examination – bone ridge anatomy and soft tissue condition
 - d. Radiograph: cephalometric or large AP film (large occlusal film)
2. Procedure Consultation
 - a. Review findings
 - b. Brief outline of procedure with benefits and risks
 - c. Patient given info booklet to read, write questions and fill out history and consent
 - d. Returned booklet and all questions answered if any. Check history and consent
 - e. Fee approximation outlined. Method of payment determined
 - f. Alginate impression of arch and procedure appointment made
3. Implant Placements Appointment (full denture-anterior mandible)
 - a. Infiltration anesthetic – vestibular areas and ridge crest
 - b. PIP paste dots on placement sites – seat denture to transfer dots
 - c. Remove crest dot, replace with marking pen dot and create mid crestal incision to bone*
 - d. Create two releasing incisions to form two flaps subperiosteal and reflect
 - e. Prepare flat ridge configuration by ostectomy and smoothing with irrigation
 - f. Implant placement (Omni-Tight™ or Midi) and suture
 - g. Prepare denture indentations, soft relines indentations, seat denture
 - h. All patient instructions, antibiotics, pain meds

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4. O-Ring Attachment Placement After Osseointegration
 - a. Remove soft reline material from denture indentations and clean
 - b. Place block out rings over ball and seat o-ring attachment cap
 - c. Place self cure, low heat, hard denture reline acrylic into clean, bonded indentation sites
 - d. Seat denture over implant o-ring complexes
 - e. Have patient close to correct occlusion with mild bite pressure
 - f. Remove from mouth when acrylic test has set to firmness
 - g. Remove any excess flash, smooth and finalize cure in warm water
 - h. Use red o-rings for first few months then proceed to dull black o-ring
 - i. Follow up at three months, then every six months for hygiene check and o-rings if desired

*Salvin: Sterile marking pens # tissue mark www.salvin.com

B. Midi Procedure on Model or in vivo

This procedure will be showing the placement of two or four Midi implants in the anterior of an edentulous mandibular model. Several things to note: On Model

- Soft “gingival tissue” is present
- Covering a ridge of unknown configuration
- We will assume that enough keratinized crestral tissue is present

1. Infiltration anesthesia – beneath periosteum very slowly in vestibular area. Crestal top is also infiltrated along its length
2. Determine where implants are to be placed for best support and retention of the denture appliance. Mark the tissue with dots some 7-10mm apart for four implants. Carry marks into vestibule anteriorly and lingually*
3. Make a mucoperiosteal incision midcrestal extending laterally (horizontally) at least 5mm past last implant tissue mark
4. Make two opposing releasing incisions at each end of crestal incision. These should slightly diverge from each other
5. Blunt release periosteum from cortical bone both buccal and lingual along full length of crestal incision
6. Expose 8 to 10mm of cortical bone both buccal and lingual for two reasons: in a flat ridge situation tension free closure is more easily achieved of periosteum is freed and second, direction of bony anatomy will be more easily discerned
7. Remove enough of the sharp ridge (if present) to attain a flattened surface wide enough to house the implant body diameter. In the mouth one may utilize rongeurs, bone files and or ss sterilized fissure burs under direct irrigation. For our exercise we will use acrylic burs

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8. Drill the pilot channels $\frac{1}{2}$ to $\frac{2}{3}$ the length of the Midi implant to be utilized. Be sure to keep the B/L direction consistent with the bone anatomy seen on the AP film and also be aware of M/D parallelism between channels. This is best determined from a front view utilizing depth guide pins. Therefore one must work in two planes simultaneously
9. Remember to be aware of how much ridge height was lost due to the flattening procedure so that the correct Midi length is used
10. Midi osteotomy drill use. Follow the pilot drill channel to its length still paying attention to the two planes of direction
11. Implant placement: carefully carry the Midi horizontally to the prepared channel and begin hand tightening with carrier driver
12. When resistance is encountered attach ratchet and continue clockwise under irrigation until full seating is attained
13. Remember the sutured tissue should come just below the circular platform of the implant
14. Soft tissue suturing – the “soft tissue” flaps are brought together around the implants. Due to the ridge reduction in this example the “tissue” is excessive and must be trimmed. Be sure to leave a band of keratinized tissue about the implant base. This may mean trimming both flaps to achieve this. Silk suturing of the interrupted type is fine
15. If Omni-Tight™ implants are utilized instead of Midis and excellent stabilization was achieved then the ball cores can be cemented to place in the implants and immediate soft relining loading can occur if soft diet is adhered to for one month otherwise the implant tops are barriered and sutured over for two months to allow for osseointegration without micro movement. A soft relining is still utilized however in the indentations and adjusted for any contact with the tissue sutured over the implant.

For implant utilization in a removable partial denture (RPD) the Model Tomographic and 3-D drill guide stent may be utilized if adequate anatomy can be picked up in an excellent impression and if there are adequate remaining strategically placed natural dentition to stabilize the guide stent. The protocol is the same then as for a single implant placement done in multiples if called for to retain the RPD. A factor that must be taken into consideration with the normal RPD in the ticonium framework that is often present in the acrylic work. This material as we all know is extremely resistant to removing in making the indentations so it is wise to prepare the RPD in advance of the procedure of implant placement thereby smoothing out the relining step and shortening the procedure time at surgery.

The Midi Crown Prosthetic on the Midi

In certain situations where the implant site bone is not appropriate for the Omni-Tight™ series implant, the Midi implant should be considered if conditions include excellent adjacent dental protection both functionally from an occlusal guidance standpoint and occlusal stress distribution from a forces standpoint. If these and other detrimental situations are minimized then a Midi implant and prosthetic could be considered. Recent studies have shown promise that smaller diameter implants when used in appropriate situations like mandibular anterior regions, maxillary lateral sites with existing adjacent dentition and narrow sites in upper and lower bicuspid sites, can be of good use, osseointegrate well, and provide an acceptable prosthetic replacement. Patients must however be fully informed that because of certain site deficiencies only a small diameter implant can be utilized and therefore some functional risk is involved and are they willing to have the procedure done or is a tooth destructive, or removable appliance alternative more to their liking? Be sure their response is noted in writing in their records.

The Midi fixed restorative option comes as a package containing the Midi implant in the length desired ie: 11mm, 13mm, and 15mm an analog and a waxing sleeve.

Restorative Protocol:

1. After osseointegration, normally 2 to 3 months in D1-D2 bone, 3 to 4 months in D2-D3 bone and 4 to 8 months in D4 bone. These are ranges and clinical judgment will prevail. A three-way polyether impression is taken of the site. Be sure that the round platform just below the hex is clearly reproduced. Sometimes careful thin retraction cord placement is indicated.
2. Laboratory directions and shade is given and the impression, analog and waxing sleeve are sent to the laboratory.
3. In the anterior areas a temporary restoration is indicated. A laboratory constructed and adjusted flipper appliance is best because when it is made to rest interproximally, have ball clasps and will not touch the integrating implant even when eating and can be carefully removed for hygiene purposes we have the best of all situations. Suckdowns are real garbage collectors. Temporary acrylic crowns will transmit forces to the implant because food will come in contact with the prosthetic and have the potential for micro movement. The flipper again can be constructed to eliminate these potential problems.
4. Be certain that the double ball portion of the Midi is out of harms way upon the patient closing fully. If not, some slight high speed with high spray volume alteration with a fine grit diamond is called for. Be sure and do not heat up the titanium.

If slight draw modification is noted, then the same procedure is utilized as above before the impression is taken: It is standard crown and bridge and a great option in those situations when the patient understands the small risk involved in using a smaller diameter implant fixture and is reluctant about having teeth undergo destruction for a three unit fixed appliance. The Midi can really be an answer, if appropriate, to otherwise extremely difficult situations