



**OCEAN**  
SURGICAL Pty  
Ltd

## Dental Implants and Full Lower Occlusal Reconstruction

# Implants

Dental implants are titanium appliances designed to replace missing teeth. They have an outer surface which integrates with alveolar jaw bone, and an inner surface into which screws and appliances can be attached to support tooth crowns and denture frameworks.

Titanium implant fixtures are a relatively new surgical means of securing dental appliances (such as crowns, bridges and dentures) directly to your living, natural jaw bone. Based on technology used in orthopaedic surgery, titanium dental implants have similar design elements to knee or hip joint prostheses.

Only qualified, medically trained, specialist Maxillofacial surgeons have the skills and facilities to provide a comprehensive way of managing your bone, soft tissue and titanium implant needs. Surgery is provided in combination with a specially trained implant-restorative-dentist who ultimately places the final implant supported dental prosthesis.

Titanium dental implants offer the most conservative and long term means of maintaining a beautiful and healthy smile, whilst naturally blending with your remaining teeth, gums and bone.

The advantages of full lower implant reconstruction include:

1. the ability to chew a wider range of food types,
2. comfort,
3. permanency,
4. ease of cleaning, and
5. restoration of optimal aesthetics.

Dental titanium implants are fully capable of sustaining a stable, functional and retentive full lower prosthesis. The Maxillofacial Surgeon works with your implant-restorative-dentist to design the ideal denture to suit your anatomy; and ultimately to produce a functional chewing end-product.

Implant supported prostheses are not for everyone. You should carefully discuss your treatment options with your general dentist/dental surgeon, or specialist oral and maxillofacial surgeon. It is important that you gain as much information as possible before you embark on any treatment regime.

### FULL EDENTULISM AND IMPLANT RECONSTRUCTION

When all teeth in an arch are lost (a total of 16 teeth), full dentures have been the traditional means of replacing the ability to chew and smile. With the bone loss that occurs with missing teeth, the lower denture in particular becomes loose and uncomfortable. Whilst serving very well as an aesthetic appliance, the full lower denture has poor retention, and is very poorly tolerated for eating. With age, patients often revert to full purée diets, or will not use their dentures at all for chewing.

As bone resorbs away, and comfort diminishes, new dentures are made, or relines are performed, to maintain both denture stability and chewing ability.

Eventually so much jaw bone resorbs away, that dentures spontaneously fall out, and chewing, biting and normal eating becomes impossible.

By placing implants into your jaw bone, three important events occur.

*Firstly*, implants stimulate surrounding bone, like natural teeth, and this leads to less local bone resorption around the implants.

*Secondly*, as implants "fix" dentures, the mandible as a whole is also used more, leading to less general mandible resorption and facial muscle wasting.

*And thirdly*, because implants also lift the denture off the underlying gum and nerves, pressure resorption and nerve compression pain (mental nerve neuralgia) underneath the denture becomes relieved.

The full lower "fixed" reconstruction aims to provide between 4-7 implants (depending upon patient size, and style of appliance) to permanently bolt a full lower appliance for permanent wear.

This newsletter aims to demonstrate two separate cases showing the steps involved, and the interactions between multiple practitioners acting as a team to "get the job done."

### CASE 1. 50 YEAR OLD FEMALE WITH FULL EDENTULISM

Originally presenting with lower facial swelling related to multiple abscessed teeth, this 50 year old lady is now edentulous. The new lower denture is free floating and presents with multiple sore points. She complains of not chewing and is generally losing weight. She has elected for a full lower implant reconstruction.

Treatment generally takes ~6-12 months and requires pre-treatment models, and both plaster and computer based tomography (CT) to reconstruct tissue and bone contours for full surgical and dental planning.

Both the surgeon and restorative-implant-dentist use these to design an individualised restorative solution.



*In the laboratory, acrylic teeth are fused to a custom made titanium frame. The titanium/acrylic structure is shown here on a plaster model. The prosthesis is made by a specialist dental technician.*

The aim of surgical treatment is to strategically and completely place implants into areas of jaw bone that will not compromise local vital structures such as sensory nerves.

Once implants are integrated, the implant-restorative dentist will design and fit the prosthetic appliance.



*Photo shows downward view of the denture bolted to the implants in the lower jaw*

The prosthodontic aims are to support a fixed, full complement of teeth in a single arch, with maximal long-term stability provided by the osseointegrated implants.



*Photo shows final occlusion (with lips retracted) showing the permanently fixed lower prosthesis, against a removable upper denture. The prostheses are supplied by the implant-restorative dentist. The patient is now fully functional and comfortable.*



*OPG x-ray demonstrating implants, with internal screws bolting the precision titanium frame supported denture to the lower jaw. The implants are provided by the oral and maxillofacial surgeon.*



*Photo showing final clinical smile. Note the fullness of lips, and with a functionally stable and permanently healthy full fixed lower dental prosthesis.*

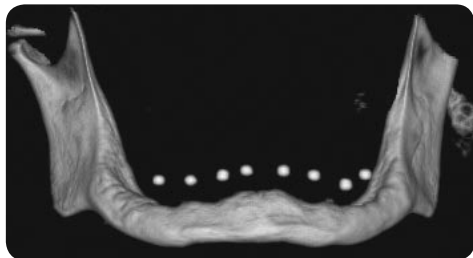
Yearly dental check ups are required to monitor peri-implant gum health, and a special device is supplied to aid cleaning between implant posts.

## CASE 2. 72 YEAR OLD MALE WITH FULL EDENTULISM

This 72 year old male had a severely resorbed lower mandible, from long term loss of teeth. He was unable to support a free floating lower denture, and was becoming increasingly intolerant of purée food. The patient elected for placement of six implants in order to permanently fix a full lower denture.

Overall treatment time from placement of implants to final placement of the fixed full prosthesis was 8 months.

Because of extreme resorption, the height of individual implants is restricted to the height of the jaw bone. In such cases, multiple implants are required to compensate for reduced implant length.



*This CT computer generated image shows the severe resorption of the lower jaw, and shows ball bearing locators to help with planning to locate ideal implant orientations and alignments.*

As implants are required to be placed into the posterior mandible, CT investigation is extremely important in being able to locate nerve trunks which travel through the residual bar of bone to give sensation to the lower lip and chin.

Surgical techniques are available that allow the surgeon to locate such nerves and to dissect them away from the pathway of ideal implant placement. Without careful and directed surgery, embedded implants may impinge on nerve territories and lead to sensory loss in the lower lip and chin.



*Lower plaster model showing appropriate placement and lengths of implants. Locations are guided by the CT.*

Pre-operative casts are also used to provide for design of ideal denture form, and to indicate placement of ideal implant locations and supports. In combination with the CT, the surgeon and implant-restorative dentist collaborate to provide the ideal pattern of implant placement which aims to minimise the potential for long term sequelae such as nerve damage.



*In the laboratory, a clear lower denture is made which contains titanium bearings. Using CT, this helps orientate the final denture to the ideal implant positions which will be placed by the surgeon. The clear denture then acts as a surgical guide.*

Implants are placed and normally buried for upwards of six months. This period of time allows for a process of osseointegration to occur, which is where bone formally adapts and bonds biologically to the titanium oxide surface of the physical implant appliance.

Once integrated, the implants are uncovered to allow for healing abutments to be placed. This process allows for gum tissue to heal around the final implant posts which will support the final prosthesis.

Overall treatment for a full fixed lower implant reconstruction can range from 6-12 months, and may vary depending upon the need for co-surgical procedures such as bone or soft tissue grafts.



*These x-rays demonstrate 6 implants, with internal screws bolting the precision titanium frame supported denture to the lower jaw. The implants are designed to span the width of the jaw bone, and are placed to avoid any nerves or blood vessels running through the jaw bone. The implants are provided by the specialist oral and maxillofacial surgeon.*



*Photo shows the final smile (with lips retracted) showing the permanently fixed lower prosthesis, against a removable upper denture. Normally only the teeth are seen with a natural smile (and the lips relaxed). The prostheses were supplied by the implant-restorative dentist. At time of completion, the patient was eventually able to fully chew and eat all types and consistencies of food.*

## IMPORTANT POINTS ON IMPLANT-SUPPORTED FULL DENTURES

1. Implants are a stable, long-term solution to retaining removable or fixed full dentures.
2. Dentures normally become loose as underlying bone resorbs with ageing and tooth loss.
3. The pattern and number of implants required to support dentures vary from patient to patient. Surgical planning varies according to individual anatomy, personal finances, and retention-stability requirements.
4. Biting forces increase dramatically with use of retention devices locked onto osseo-integrated titanium implants.
5. Treatment spans vary from 6-12 months, and there are discreet healing periods where temporary dentures may not be worn at all.
6. Elderly patients with chronic medical disorders may be eligible for placement onto Enhanced Primary Care (EPC) programmes. With EPC you may benefit from substantial subsidies on your implant surgery and denture provision... Through Medicare.
7. Only your Maxillofacial Surgeon and implant-restorative-dentist can coordinate your overall rehabilitative occlusal needs. Many (but not all) aspects of your care are Medicare or Federal-tax subsidised.
8. With a referral by your medical GP (whilst referring to this newsletter), your initial consultation and baseline x-ray (OPG) are bulk-billed by the Maxillofacial surgeon.
9. It is important to check the credentials of your clinician to ensure that you are appropriately clinically managed, and are not missing out on potential Medicare subsidies.
10. Certain chronic medical conditions such as bisphosphonate use, heavy smoking and uncontrolled diabetes may be contra-indicated for implant surgery. You should discuss your medical condition carefully with your surgeon before embarking on any surgical course.
11. Implant placement surgery is usually conducted under local anaesthetic in specially designed surgical suites. Post-operative courses are usually pain, swelling and bleeding free.
12. There are risks and complications with all types of surgery, and you should carefully discuss all such appropriate risks with your surgeon.

## TECHNICAL CONSIDERATIONS

1. Multiple implant supported full arch prostheses are sometimes called a "high tide bridge". This is because the fixed prosthesis appears to sit on stilts, with a clear space clearly seen beneath the denture. The space is not seen with normal eating or smiling, and can only be viewed with full lower lip retraction.
2. The space is extremely important to enable cleaning around the implant abutments, and which are separated to enable self clearing. Specific cleaning instruments are also available to facilitate home care. Regular 12 monthly dental check ups are required to monitor peri-implant bone and gum health.
3. Full arch reconstruction is technically very complicated. Time frames for treatment can reach up to 12 months, and final prosthetic effect may differ from the original plan, according to effects of surgery.