

## Rescuing Bridges in Trouble

trimmed, checked for proper occlusion, and polished.

The choice of cement will depend on the degree of retention present and how long the bridge is expected to remain in place. If more treatment is anticipated in a few days or weeks, use a soft cement like Nogenol. For several months, go a little harder, perhaps Dycal. Rarely should permanent cement be used at this stage because of the likelihood of refinement later.

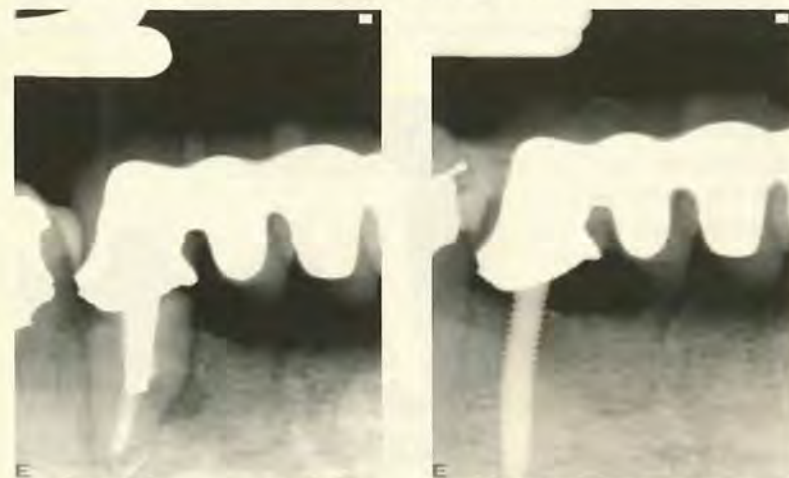


fig. 6 - The 86 year-old male patient presented with a mandibular fixed bridge canine to canine. In 1999 one abutment, tooth #27, became painful to pressure due to a vertical split in its non-vital root. The bridge was removed without damage. Tooth #27 was extracted. The bridge was recemented to tooth #22 and splinted with a horizontal titanium bar bonded with a composite.

fig. 6a - After 6 months of healing, a Dentatus implant was placed in the area of #27. The bridge was adapted with Unifast, resplinted and recemented. It is fully functional after 3 years.

fig. 7 - This 59 year-old woman first presented in January 1985 to recement her upper anterior 8-unit bridge. Prognosis was poor, due to few abutment teeth and unfavorable leverage.

fig. 7a - In November 1985, the bridge loosened and required recementing once a year. In May 1998 four Dentatus implants were inserted and the four bridge pontics were retrofitted to them. The bridge has remained solidly in place for 4 1/2 years.



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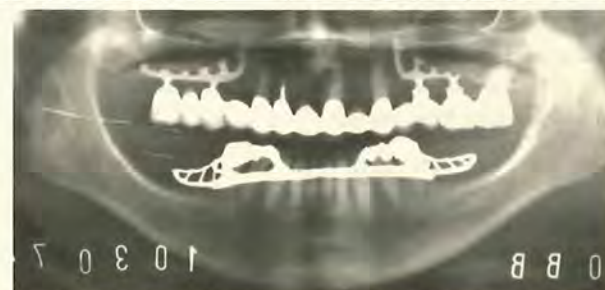


fig. 8 - This dentition was rescued 3 times over 27 years, utilizing 3 varieties of implants. In 1973, bilateral maxillary blade implants were inserted to replace an uncomfortable partial denture. All functioned well for 17 years.



fig. 8a - May 1990 panorex reveals bone resorption at right implant. Ceka anchors supporting lower partial denture are visible on lower premolars.

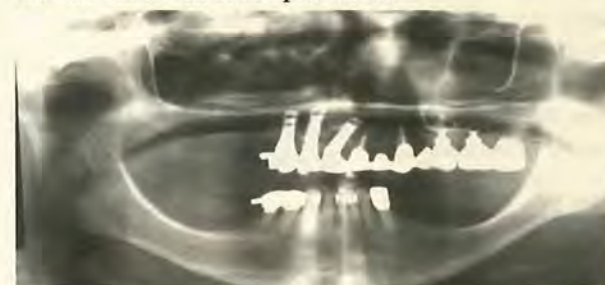


fig. 8b - In January 1992, the right blade was removed. Teeth #'s 6-7 were mobile. The patient rejected a sinus lift for new posterior implants. So, HA coated Biovent implants were placed at #'s 6,7,8 location. After integration 3 splinted crowns were attached with a Dalbo cast into # 6 crown. A unilateral partial denture was fabricated, which still functions well today.

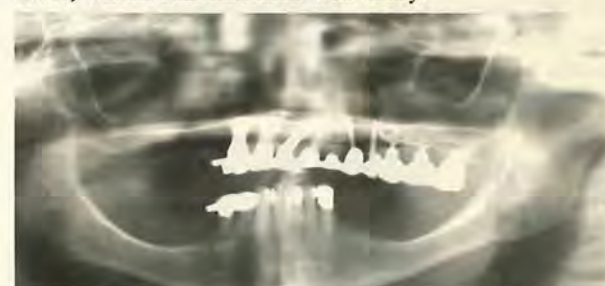


fig. 8c - In October 1998 patient presented with a vertical root fracture of #11 and it was removed. Crowns #'s 8-9 were splinted to reduce the overload while #11 socket healed. In November 1999 two Dentatus implants were placed in areas 11 and 12 for additional support. The bridge was adapted to fit over the implants and recemented. This 86 year-old woman is comfortable and functioning well with the left blade implant for over 29 years.



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## Rescuing Bridges in Trouble

by Dr. N. Shreve Spitler

Dentists generally agree that fixed replacement of missing teeth is preferable to removable prosthesis. Fixed bridges or implant-supported crowns usually serve the patient well for many years. But the reality is that no matter how well planned and constructed, failure of one or more components can and does occur, especially after long-term use.

Some of the problems that threaten the viability of fixed prosthesis are: (1) Root caries of abutment teeth (2) Advanced periodontal disease of abutment teeth (3) Split roots, usually in endodontically treated teeth (4) Periapical infection after endodontics (5) Failure of posts and buildups under crowns (6) Mobility due to overload of abutment teeth (7) One abutment crown loose and decaying.

Usually only one of the abutments has pathology, but the viability of the whole bridge is threatened. The loss of an extensive prosthesis is a severe disappointment to both the patient and dentist. If something can be done to extend the healthy and functional service of the threatened prosthesis, the patient will be extremely grateful, and the creative dentist regarded as a hero.

### Solution

Fortunately, a solution to this dilemma is possible in many instances. Mini implants are small screw like devices that can be placed in edentulous areas, adapted to an existing bridge, and put into service immediately. They have a diameter of 1.8 millimeters. The author has placed two types of mini implants over the last five years. The MTI Modular Transitional Implant [Dentatus USA] is a bendable titanium screw, which is designed to be placed into the bone between conventional implants during integration. Although not suggested by the manufacturer for permanent placement, it has been observed that long-term use under satisfactory conditions is possible, healthy, and desirable. Where adequate dense alveolar bone is present, the author has observed excellent results.

Another mini implant that can be utilized for this procedure was developed by Dr. Victor Sendex [Imtec]. This device is shaped like a pointed screw, which can thread into less dense bone, starting with a shallow osteotomy. The implant is not bendable, making it more difficult to



fig. 1 - An 83 year-old male presented with bridge abutment tooth #28 infected and painful due to a split root. It was extracted in March 2000.



fig. 1a - Six months later, one Dentatus MTI implant was placed. The pontic was remade and bonded to the bridge.

continued on p. 2



## Rescuing Bridges in Trouble

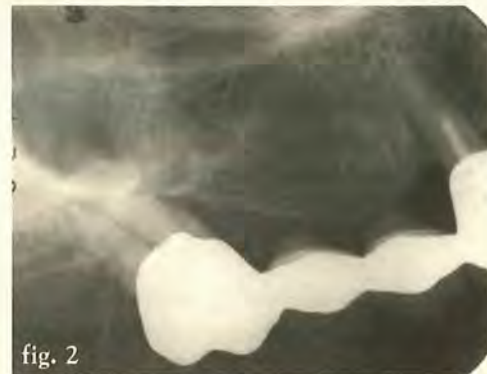


fig. 2



fig. 2a



fig. 2b



fig. 2c

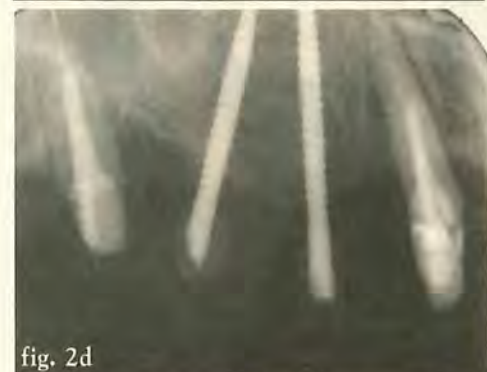


fig. 2d



fig. 2e

**fig. 2 -** The 86 year-old female patient developed severe periodontal disease at the molar bridge abutment. In 1995 two Dentatus MTI implants were placed into the premolar region to support a reinforced composite bridge. The molar remained in place for several months, became symptomatic and was extracted. A wire reinforced composite bridge was placed. The bridge is tight and functioning well for over seven years.

### Removal

Removal of prosthesis is usually necessary, being careful to cause as little damage as possible to the abutment teeth and crowns. I have found the Higa bridge remover safe and effective. A small hole is made through the occlusal of an abutment crown. A steel wire is passed under the crown-pontic joint, and threaded onto the axle of the Higa device. While holding the push rod inside the occlusal opening against tooth structure, the handle is rotated with moderate force and likely the crown will snap loose. This process may be repeated for other retainer crowns until the entire bridge is removed. Because some crowns must be cut for removal, it is wise to have an index or an impression ready in advance to fabricate a temporary restoration.

### Placement

Before placing mini implants, it is essential that the practitioner have training in the placement of dental implants. The simplest cases should be attempted first. Start on a case with plenty of alveolar bone and easy access for the contra angle and drill. Check progress frequently with digital x-rays. Corrections can easily be made with help of the measuring feature in the software. For the Dentatus MTI implants the osteotomy should be several millimeters short of full depth in maxillary arch, but needs to go full depth in the hard bone of the mandible. With the Imtec system, only a starting hole is needed in the maxilla, but the channel must go deeper in the hard mandibular bone. If threading becomes too

*continued from p.1*

align with an existing pontic. However, in the maxilla the threading and compaction of bone seems to be advantageous.

### Diagnosis

When a problem related to any fixed prosthesis is discovered, all structures involved must be thoroughly examined. If pain is present, appropriate treatment to alleviate the cause should be carried out as soon as possible. This may require removal of the bridge and possible extraction of an abutment tooth. Remaining teeth, implants if present, and edentulous areas should be evaluated with clear radiographs, pocket probing and pulp testing. Mobility must be checked as well as examining for caries. A panoramic X-Ray is often helpful as is digital radiography.

### Treatment Planning

The treatment plan is primarily determined by the amount of support needed and evaluating how much can be gained by placing mini implants. Each case must be judged by the unique circumstances presented. Leverage must be considered, because loss of a terminal abutment tooth will convert an abutment crown into a cantilevered pontic, when an implant is placed into an existing pontic. Overloading these small implants will only result in a temporary solution to the problem. However, in four to six months an extraction socket can heal and generate enough bone to support a conventional implant, or a mini implant. Creativity and ingenuity based on experience play an important role in this process.

Treatment can be organized into four phases: removal of existing prosthesis, placement of mini implants, adapting the prosthesis to implants, and re-cementing prosthesis in place.

difficult, remove the implant and deepen the channel or change to a shorter implant. When drilling the osteotomy, it is essential not to overheat the bone. Use low speed, and remove frequently to cool and clean the drill with a spray of sterile saline.

Caution: Do not attempt placement of any type of dental implant without proper instruction and/or supervision. The information above is only a brief outline of the steps involved.

### Preparation

Once the mini implants are placed the bridge may be modified, provided not too much damage occurred during removal. It is often helpful to bend the head of a Dentatus implant to align with the desired site on the bridge. Usually the gingival area of a pontic must be hollowed out to accommodate the implant head. Start by coating the gingival surface of the pontic with Spray Check [Perfecto] or Accufilm liquid [Parkell]. After it dries, place the bridge in alignment with abutment teeth. Rub the pontic on implant to make a bare spot. Grind away a few millimeters of porcelain or gold and repeat until bridge seats well. The occlusion should be normal.

### Adaptation

Next a composite abutment must be formed to the mini implant head so that it can be cemented to the bridge. First cut a piece of rubber dam about one inch long and as wide as the mesial-distal dimension of the pontic. Punch a very small hole for the implant and place the segment of dam over the protruding implant head until it lies flush with the gingival surface. This will prevent composite materials from flowing into tissue. Lubricate the tapered hole in pontic with any heavy lubricant or toothpaste. Fill the space with self-curing crown buildup composite and seat into place. Have patient close in centric until cured. When the bridge is removed, the implant head will be shaped like a resin crown prep, and will fit accurately into the pontic.

### Provisional Restoration

In case the original bridge is not reusable, a provisional restoration will be needed. Be sure to have prepared a matrix or pre-op impression. Matrix buttons [Advantage Dental Products] are very satisfactory for this purpose. First the implants must be modified to the shape of a crown prep. After placing segments of rubber dam, transparent core forms from Pentron are selected for size and trimmed as needed. Pack light cured composite into the matrix, seat and light cure. Remove matrix and trim with finishing burs. Coat these abutments with a heavy lubricant to prevent bonding of provisional material. The previously adapted matrix may now be filled with a bisacryl material and seated to place. Remove when partially cured to prevent locking into any undercuts. In a few minutes the provisional bridge may be *continued on p. 4*

**fig. 5 -** This 83 year-old female presented in November 2001 with severe root caries in tooth #15. The abutment crown



was cut away from the pontic and tooth #15 was extracted.



**fig. 3 -** The bridge abutment tooth #29 was lost due to periodontal disease. An Imtec MDI implant was placed into #30 pontic. Teeth #'s 27 and 28 were splinted.



**fig. 4a -** Another MTI Implant at #21 area was added the following year.



**fig. 5a -** In December 2001, the pontic was grooved at the distal portion to allow placement of a diagonal Dentatus implant. The implant was bonded to the pontic with Geristore oval cure composite. For additional support, teeth #12 & 13 were splinted by cutting an occlusal groove into which Ribbond was placed with a flowable light cure composite. As of August 2002, the patient was comfortable and functioning well.