

**Clinically Significant****ABSTRACTS**

Cavazos E, Bell F. **Preventing loosening of implant abutment screws.** *J Prosthet Dent* 1996; 75:566-569.

A universal and ongoing dilemma is the occasional loosening of implant abutment screws. This problem is not confined to the screws within any one implant system. The authors present a 6-step protocol for a simple modification of the inside of abutment screw cylinders and the subsequent injection of polyvinyl siloxane. A procedure is presented for straight screw-retained prostheses, as well as one for cemented prostheses with angled abutments.

"This procedure has been used for more than 100 single-unit crowns, and as yet, a crown has not loosened when the procedure was done properly," the authors say. Dimples are placed on the inside of the abutment screw cylinder wall just above the screw. Then, the polyvinyl siloxane impression material is injected into the screw hole while aspirating with a 30-gauge needle placed within the screw hole to act as an air vent.

The technique is well-illustrated with 5 graphics and 3 photographs. Materials are listed with each step.

Of special interest is the fact that the tightening of the abutment screw is advocated "with maximum finger torque." Considering the details of this technique, the clinician is prompted to ask why a calibrated intraoral torque wrench is not used routinely with this technique. Otherwise, the procedures can be clinically useful almost on a routine basis. The authors also caution that their procedures "should not be used with an *Omniloc* (Calcitek, Carlsbad, CA) fixed abutment or other abutments that have a self-contained, free-wheeling, and nonremovable abutment screw." Their concern is

that the polyvinyl siloxane impression material "will become trapped between the head of the screw and the internal surface of the abutment, directly over the head of the screw, and cannot be removed."

Regardless of the clinical usefulness of this technique to prevent screw loosening, the authors firmly state that this does not supplant the need to adhere to the necessity of correct implant positioning and the prosthodontic development of appropriate occlusal schemes.

**Contact:** Edmund Cavazos, DDS, University of Texas Health Science Center, Department of Prosthodontics, 7703 Floyd Curl Drive, San Antonio, TX 78250-7812. ▼

Balshi TJ. **An analysis and management of fractured implants: A clinical report.** *Int J Oral Maxillofac Implant* 1996; 11:660-666.

This timely analysis of the causes and solutions of fractured implants is based on a clinical study (not a simulated project) of 4,045 implants that are 3.75 mm in diameter. Although only eight of these implants had fractured, it is necessary to evaluate possible fracture causes and to know how to deal with the ensuing implant/prosthetic problems.

The author has categorized causes of implant fracture into the following categories:

- manufacturing-induced fractures;
- framework-induced fractures;
- overload-induced fractures.

He emphasizes the need to avoid, or at least minimize, shear loads on implants as well as bending or torsional forces that place undue stress on implants. "Biomechanical or physiologic overload appears to be the most common reason for implant fracture," he says.

He strongly advises that prosthetic frameworks have an adequate fit, a passive fit, and that care control of occlusal forces be provided

to eliminate all posterior contacts in mandibular eccentric movements. His list of precautions include:

- staggered placement of implants;
- use of wider-diameter implants;
- avoidance or minimization of posterior cantilevers or buccolingual offsets.

The article contains one admonition that bears repeating: "If even the slightest fit discrepancy can be detected, the casting [of the prosthetic framework] should be cut, and the prosthesis should be reassembled."

He acknowledges the fact that parafunctional habits have been identified as being major etiologic factors of implant fracture. This concern is in concert with previously published articles on this subject that have warned clinicians of the need to be aware of the consequences of parafunctional habits (Perel ML. Parafunctional habits, nightguards, and root-form implants. *Implant Dent* 1994; 3:261-263; and English CE. Biomechanical concerns with fixed partial dentures involving implants. *Implant Dent* 1993; 2:221-242).

There are two hints that implant fracture may occur after the implant prosthesis has been worn: "Screw loosening is often observed before implant fracture," and "angular bone loss around the implant is frequently noted."

The 11 radiographs are well-taken and clearly defined. They illustrate, along with the three color clinical photos and five black and white photos, the solutions to implant fractures. Included are:

- removal and immediate replacement with implants of wider diameters;
- replacement of abutments on adjacent implants and replacement of original prosthesis;
- implant refacing with a special tool and abutment screw modification.

**Contact:** Thomas J. Balshi, DDS, Prosthodontics Intermedica, Institute for Facial Esthetics, 467 Pennsylvania Ave., Fort Washington, PA 19034. ▼

the surgeon's tactile sense.

5. Hold the osteotome securely in position and have the assistant tap on the handle upon verbal command.

— If there is no movement inward of the osteotome tip, the next smaller osteotome instrument or a 6 mm hollow trephine drill is used with irrigation at slow speed. Caution is advised with the trephine because tearing of the membrane with the rotating instrument can readily take place. (See Figure 1.)

— After penetrating the crestal cortex (only slightly) with the trephine, the tapping on the osteotome is repeated until the bone block intrudes. (See Figure 2.)

**Note:** This step requires patience and gentle handling.

6. As soon as the block and membrane are movable, use graft material to back-fill the osteotomy site. (See Figure 3.)

7. Use the osteotome once again to intrude the graft material by several millimeters.

8. Repeat this filling and compacting procedure three or more times. The goal is to achieve 12 mm to 15 mm of elevation. (See Figure 4.)

Because it is essential to obtain primary closure, Summers advocates that site development be delayed at

times for three weeks or more following extractions in order to allow soft tissue to bridge over open sockets. He always finishes the future site development procedure with a membrane. "The resorbable complex collagen products have worked nicely with these procedures," he says.

Summers has completed 48 future-site-development procedures to date. In that period of time, there has been only one sinusitis in a case in which primary closure was not achieved, and the future site development surgery was done at the same time that the teeth were removed. Otherwise, most other procedures he has performed have had minimal postoperative symptoms of any kind.

Summers notes that he is careful to test for schneiderian membrane integrity. If there is a slight tear, a collagen membrane is used in the depth of the site in order to control and contain the graft material. "I have learned that at least three loads of graft material are needed in each site, and that the schneiderian membrane is not very fragile as long as sharp instruments are avoided." He suggests using 10% to 20% *OsteograftN* (CeraMed Corp., Lakewood, CO) in the graft mix.

This material is more radiopaque than other fillers, giving better visualization on radiographs. *OsteograftN* also helps minimize shrinkage of the site within the first few months.

**Contact:** Robert B. Summers, DMD, 2 East Montgomery Ave., Suite 204, Suburban Square, Ardmore, PA 19003-2416.

### Related Readings

1. Summers RB. Maxillary implant surgery: The osteotome technique. *Compend Cont Educ Dent* 1994; 15:152-162.

2. Summers RB. The osteotome technique: Part 2 — The ridge expansion osteotomy (REO) procedure. *Compend Cont Educ Dent* 1994; 15:422-436.

3. Summers RB. The osteotome technique: Part 3 — Less invasive methods of elevating the sinus floor. *Compend Cont Educ Dent* 1994; 15:698-708.

4. Tatum OH. Maxillary and sinus implant reconstructions. *Dent Clin North Am* 1986; 30:207-229.

5. Summers RB. Conservative osteotomy technique with simultaneous implant insertion. *Dent Implant Update* 1996; 7:49-53. ▼

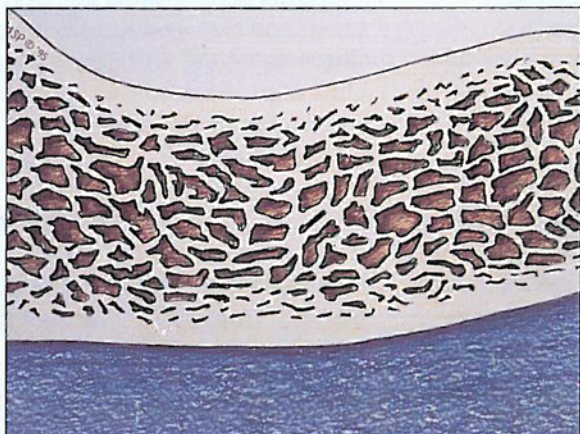


Figure 5. In 7 to 8 months, the graft material should convert to bone. Implants can be inserted.

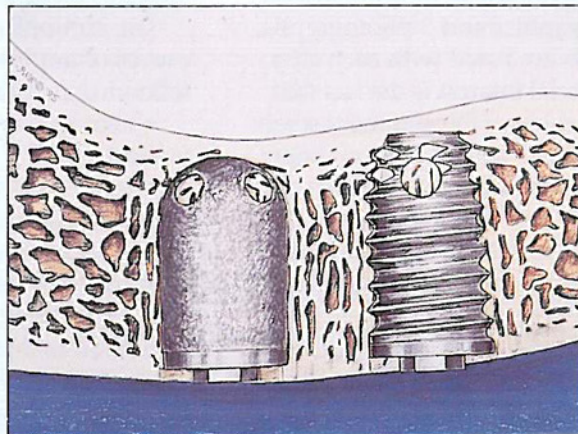


Figure 6. The widest-diameter implant possible is used.