MANAGEMENT OF AN ABSCESS AROUND THE APEX OF A MANDIBULAR ROOT FORM IMPLANT: CLINICAL REPORT

Thomas J. Balshi DDS*
Charles E. Pappas MD*
Glenn J. Wolfinger DMD**
Ramon E. Hernandez DO***

An infection at the apex of a root form implant requires surgical intervention in combination with antibiotic therapy in an attempt to maintain the implant. Three types of surgical approaches to gain access to the involved implant apex are (1) intraoral, transmandibular; (2) intraoral, periosteal dissection; and (3) extraoral. A clinical report is presented describing the extraoral approach to achieve access and eliminate the source of the infection, while preserving the implant and the integrity of the final prosthesis. (Implant Dent 1994;3:81–85)

The use of root form implants has increased in recent years for the treatment of edentulous patients with fixed prostheses.[1, 2] In spite of the most meticulous attempts for sterility and precautionary surgical techniques, patients have developed a variety of complications associated with implant placement.[3] One such complication is infection at the apex of a root form implant, characterized by suppuration and bleeding, loss of alveolar bone, and pocket formation around the implant. Etiologic factors including surgical trauma, overloading of the implants at an early stage, and the role of microorganisms have been reported.[4] Infections around endosseous implants may have an adverse effect on osseointegration and/or rapid deterioration of the surrounding bone, requiring removal of the implant.

According to Meffert,[5] problematic implants can be grouped into one of three categories, ailing, failing, or failed. The ailing implant exhibits bone loss with pocketing, but is static at maintenance checks. The failing implant exhibits bone loss with pocketing, bleeding upon probing, purulence, and evidence of continuing bone loss irrespective of therapy. The failed implant has mobility, a dull sound on percussion, and a peri-implant radiolucency.

The failed implant must be removed since it is nonfunctional and bone loss will continue. The ailing or failing implant surface can be treated in an attempt to preserve the implant. Surfaces of ailing or failing implants have been shown to be contaminated with endotoxin. As long as endotoxin is present, there can be no biologic repair. The contaminated surface must be cleaned and detoxified in order for biologic healing to occur.[5] Because of the rough surfaces on some implants and threads on others, mechanical management of peri-implant infections is difficult. Once exposed to bacterial colonization, the course texture facilitates growth and prevents removal of bacteria by mechanical means.[6]

Previous articles have discussed the management of peri-implant infections involving the coronal portion of implants.[5–7] Direct access for treatment of the coronal area of an implant is easy to achieve. The rationale in treatment is to remove the source of the infection, decontaminate the implant surface, maintain function, and enhance oral hygiene considerations.

When infection occurs at the apex of a mandibular root form implant, a surgical procedure is necessary to gain access to the site. Three different surgical approaches can be used.

INTRAORAL TRANSMANDIBULAR APPROACH

The intraoral transmandibular approach through the mandible involves removal of the involved implant with a trephine. An advantage of the intraoral approach is that there is no external scar. Disadvantages of this technique are limited access to the infected site through the trephine hole, inability for true sterility of the surgical site because of intraoral contaminants, and loss of the implant.

INTRAORAL PERIOSTEAL DISSECTION

Periosteal dissection of the muscles and removal of bone from the anterior inferior border of either the facial or lingual side of the mandible gains access to the infected site. The advantage of this approach is that there is no extraoral scar and the implant is maintained. The disadvantages of this technique are limited access and visibility, inability for true sterility of the surgical site because of intraoral contaminants, postoperative pain and swelling, and, for a facial approach, removal of additional bone to gain access.

*Private practice, Fort Washington, PA.
**Private practice, Fort Washington, PA; Clinical Assistant Professor, Department of Prosthodontics, Temple University School of Dentistry, Philadelphia, PA 19140–5096.
***Private practice, Fort Washington, PA; Clinical Assistant Professor, Department of Endodontics, Temple University School of Dentistry, Philadelphia, PA 19140–5096.

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EXTRAORAL APPROACH

The extraoral approach requires a skin incision, generally made in a natural skin fold under the chin. Dissection leads to the source of the infection and the tissues surrounding the apex of the implant. This is the most conservative and least destructive approach. Excellent access to and visibility of the infected site is provided, which facilitates thorough debridement of the infected tissues. A sterile surgical technique is used and the implant is preserved. There is usually limited postoperative discomfort.

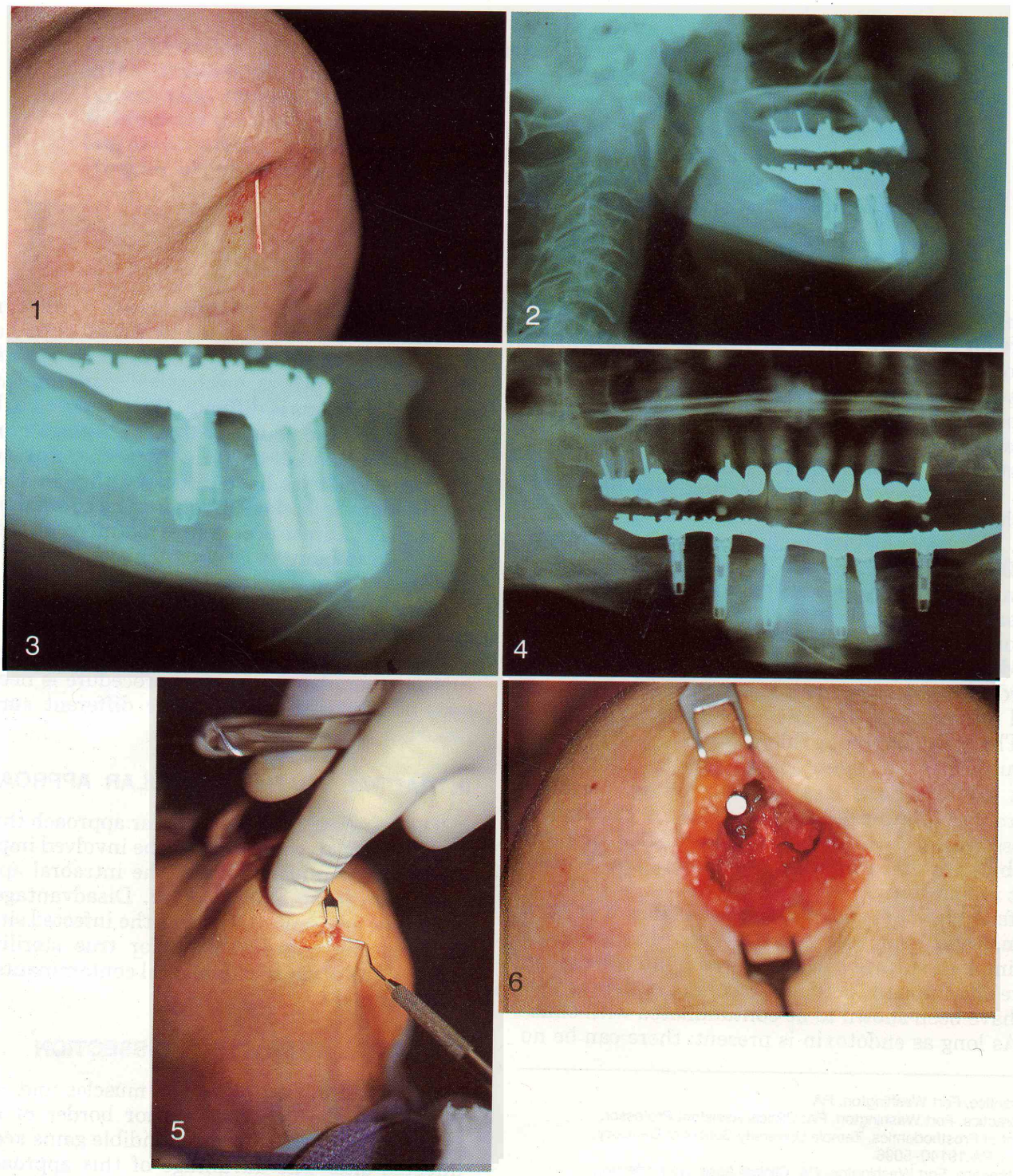

Fig. 1. Clinical view of gutta-percha point in fistulous tract.
Fig. 2. Lateral cephalometric radiograph with gutta-percha in fistulous tract.
Fig. 3. Close-up section of lateral cephalometric view with gutta-percha in fistulous tract.
Fig. 4. Panoramic radiograph showing direction of fistulous tract with gutta-percha point.
Fig. 5. Clinical exploration of fistulous tract before surgical intervention.
Fig. 6. Muscle reflection for access to apex of infected root form implant.

point and probe (Fig. 1). Confirmation was made radiographically with the gutta-percha point in place (Figs. 2 to 4). The fistulous tract was traced to the apex of the implant in the position previously occupied by the lower right lateral incisor.

The prosthesis was removed to evaluate the stability of the individual implants. Implant stability and lack of sensitivity to percussion resulted in a decision to use the extraoral approach.

SURGICAL TECHNIQUE

After administration of intraoral and extraoral anesthesia, the patient was prepped and draped in the usual manner. The fistulous tract at the inferior border of the anterior mandible was probed to determine its course and depth (Fig. 5). A 4-cm incision was made with a No. 15 scalpel blade through the skin and subcutaneous tissues. The platysma muscle was identified and sectioned with simultaneous isolation and removal of the fistulous tract. The dissection continued until the apex of the implant was located (Fig. 6). All accessible infected tissue surrounding the implant was removed by curette.

Under profuse sterile saline irrigation, the exposed apical portion of the implant was sectioned with a diamond bur to permit further debridement of the area (Fig. 7). Following removal of the implant apex and surrounding granulation tissue (Fig. 8), the area was irrigated with saline and sponged with 10 percent povidone-iodine solution (Betadine; Purdue Frederick Company, Norwalk, CT) (Fig. 9).

By dividing the central fibers of the platysma muscle approximately 3 mm from its mandibular insertion, a "paddle myofacial flap" was turned clockwise into the defect. This was sutured with 4–0 Vicryl horizontal mattress sutures. A muscle flap was elevated and moved to the anterior border of the mandible (Fig. 10). Subcutaneous closure was obtained using 5–0 Vicryl sutures to pull the muscle flap (Fig. 11) over the osseous defect by suturing it to muscle and periosteum anterior to the wound. Nylon sutures (5–0) were used for the skin closure (Fig. 12).

An antibiotic was prescribed for 10 days postoperatively. The patient healed uneventfully. When comparing the radiograph taken immediately after the surgical debridement procedure (Fig. 13) with that taken 14 months postoperatively (Fig. 14), it appeared that complete bone fill had occurred and the implant remained osseointegrated. The prosthesis was stable and was functioning satisfactorily 3 years later.

DISCUSSION

Infection around the apex of a root form implant can be difficult to diagnose until the patient presents with associated symptoms. In this case the infection may have been present at the time of second-stage surgery, abutment connection, or prosthesis delivery, but was undetectable. At the time of surgical debridement, the implant was stable with no signs of mobility and no sensitivity to percussion.

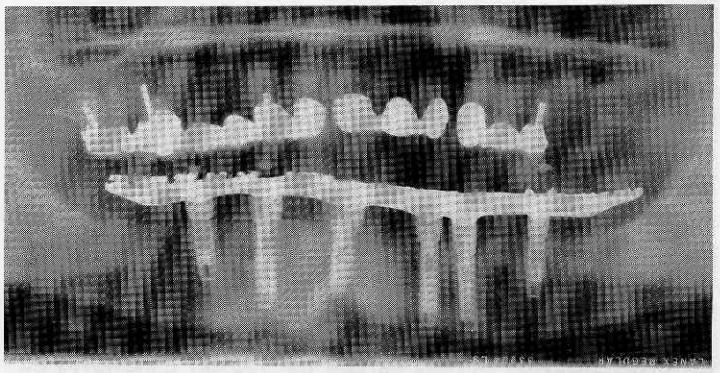

Fig. 13. Immediate postoperative panoramic radiograph. Note osseous defect.

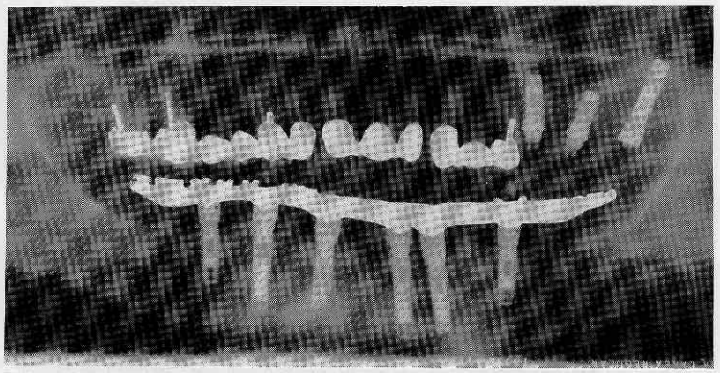

Fig. 14. Panoramic radiograph 14 months after surgery showing osseous fill of the surgical defect.

Aggressive treatment to surgically debride the area and eliminate the infected tissues and implant surface was indicated. Conservative treatment using only antibiotic therapy probably would not have completely eliminated the infection.

SUMMARY

An extraoral approach was used to treat an abscess around the apex of a mandibular root form implant. The combination of surgical intervention and antibiotic therapy eliminated the infection and maintained the integrity of the definitive prosthesis.

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The diagnosis and treatment of a patient with an abscess around the apex of a root form mandibular implant by an extraoral approach is described in this patient report.

PATIENT REPORT

Eight months after stage II surgery and 5 months after delivery of the definitive fixed-detachable implant prosthesis, an 81-year-old Caucasian woman presented with a complaint of pain and swelling beneath the right anterior inferior border of the mandible. Extraoral examination revealed a tender, palpable, erythematous mass containing a fistulous tract with slight purulent fluid drainage. The area was warm to the touch and the patient had a low-grade elevated temperature, moderate leukocytosis, and localized lymphadenopathy.

No intraoral signs of infection were apparent. The oral mucosa appeared to be healthy. Intraoral examination involved palpation of the facial and lingual aspects of the mandible to determine the extent of the swelling.

Diagnosis as to the source of the draining fistula was clinically determined by the insertion of a gutta-percha

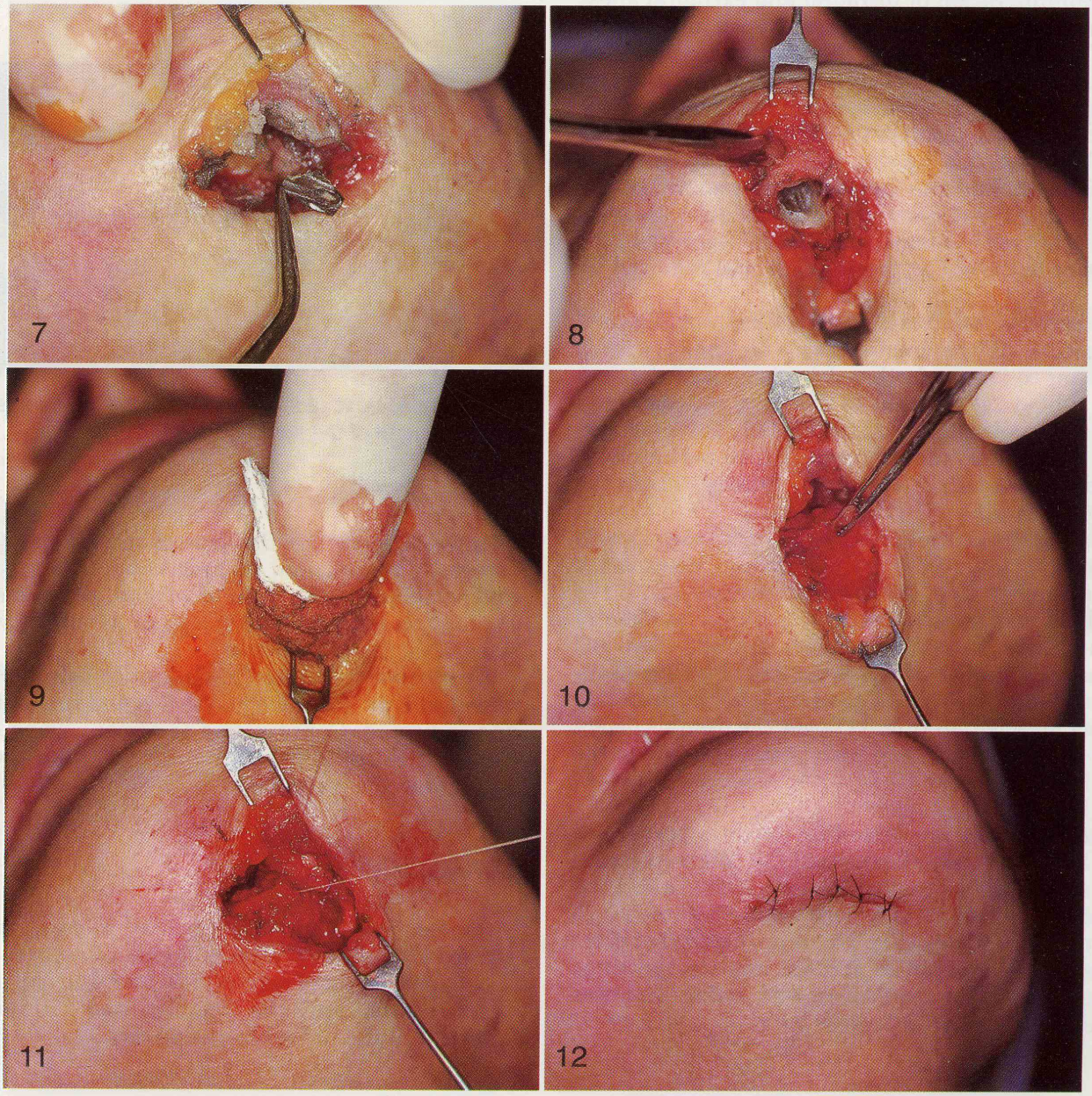

Fig. 7. Removal of the apical tip of the implant.
Fig. 8. Debridement exposing the margins of the osseous defect.
Fig. 9. Cleansing the area with Betadine solution.
Fig. 10. Muscle flap pulled over osseous defect.
Fig. 11. Subcutaneous suturing is done to position muscle flap over the borders of the osseous defect.
Fig. 12. Skin closure following suturing.

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Reprint requests to:
Dr. Thomas J. Balshi
Prosthodontics Intermedica
467 Pennsylvania Avenue, Suite 201
Fort Washington, PA 19034