Abstract: A previously published article by the author reviewed the current data on mini dental implants and their use in denture stabilization. The case showed the insertion of six mini implants in the maxilla to stabilize a full upper denture, as well as four mini implants in the mandible to support a partial. Such a case may be categorized as a “classic” and straightforward MDI denture stabilization treatment. In contrast, the case illustrated in this article — a medical first — demonstrates the more advanced treatments made possible by MDIs. The patient in this case was a quadriplegic who underwent extraction of 25 teeth, followed by placement of eight MDIs in the maxilla and seven MDIs in the mandible. The procedure was performed in less than 9 hours under general anesthesia in a hospital.

In an article previously published in the May/June issue of this magazine, I outlined my decades of experience with dental implants, along with my belief in the practicality and utility of mini dental implants (MDIs) as a more affordable and accessible alternative to traditional implants for many patients. As stated in that article, MDIs require less bone to place, are less invasive, and treatment can be completed much faster than with traditional implants. MDIs have been used for more than 10 years, and a recent prospective clinical study showed a 98.3% success rate after a 1-year observation period. A 5-year study following 2,500 mini dental implants found a success rate of 94.2%.

I estimate that I place approximately 100 MDIs each month, and have seen many times over the enthusiastic responses of patients for whom they make a life-changing difference. While these implants can be used to support crowns and bridges, they are primarily utilized for the stabilization of dentures. Patients experience an immediate and dramatic boost in retention with these implants, making it a very rewarding treatment to offer.

The simplicity of the basic MDI denture stabilization treatment makes it an attractive procedure for many dentists, but MDIs can also be utilized in complex cases such as the one shown in this article. While the individual techniques used in the case illustrated here were not new to the team involved in the procedure, I believe that the case itself may be a medical first.

Case presentation

The patient in this case was a 52-year-old male who had become quadriplegic in a tree-trimming accident some 20 years prior to this treatment. The patient’s medical condition was a C4, C5 complete, meaning he was paralyzed from the lower neck down. The injury prevented proper oral care and rapidly led to the destruction of the patient’s teeth. The patient’s benefits from the state of Kansas entitled him to a single hospital treatment for the condition. He had seen a number of local specialists prior to visiting my office, none of whom could come up with a satisfactory solution given the constraints of the case.

When I met with the patient, however, I was able to propose a realistic — although ambitious — treatment plan. My experience placing MDIs, combined with the fact that I have hospital privileges at the facility where he would be treated, presented a strong opportunity.

An initial panoramic X-ray was taken, which showed 25 severely abscessed and decayed teeth (Figure 1). (A CT scanner could not be used during treatment planning due to the patient’s condition and mobility restrictions.) A treatment plan to extract the decayed teeth and place eight MDIs in the maxilla and seven in the mandible was presented to the patient and accepted.

The panoramic image was used to determine initial implant locations and sizes. On the day prior to the surgery, slots were cut into the immediate denture to accommodate the future sites of the implants, and a bite registration was taken outside of the mouth.

On the day of the procedure, after nasal intubation and general anesthesia, a 4 x 4 throat pack was placed, and the 25 teeth were extracted. Any bone loss due to breakage or tooth attachment was harvested and used for autogenous grafting where needed later.

Alveoplasty was then performed as needed, and the 15 3M™ ESPE™ MDI Mini Dental Implants were placed. The MDIs ranged from 10 mm to 18 mm in length and 1.8 mm to 2.4 mm in diameter. Space limitations prohibit the inclusion of details on the advanced technique of threading an implant between two opposing extraction sites, but it should be noted that varying...
densities, widths, and depths of bone were encountered. Multiples of every size and diameter of MDI were on hand for the procedure in order to be prepared for any necessary adjustments.

Experienced readers reviewing the radiographs may note that one more implant could have been placed in the No. 31 area above the inferior alveolar nerve; however, without having the 3D scan and not knowing the precise length of bone, I did not want to risk any chance of a nerve parasthesia, especially with this patient. The radiographs also show how some of the lower implants are slanted away from the nerve areas (Figure 2). 3M ESPE MDIs can withstand up to 30 degrees of divergence, and this slight angle actually adds to the final denture retention. This is done regularly, and the visual slanting of the MDIs on the X-rays is of no consequence.

Following placement of the implants, the autogenous grafts were placed where necessary and into extraction sites along with collagen plugs, and the sites were closed with 4-0 Vicryl™ suture (Figure 3). These steps help to preserve bone and minimize bleeding. Practitioners are encouraged to do a thorough job of this, as it greatly helps in the final product.

Metal housings were snapped onto the O-ball heads of the implants, and rubber base reline impressions were taken using the bite registration as a guide. Analogs were placed in the impressions, and the case was sent to Kaylor Dental Lab in Wichita, Kansas, which processed the snaps and relined the denture within a few hours. The laboratory’s assistance was greatly appreciated, as insertion of the dentures on the same day helps to minimize swelling and bleeding, and to lessen the patient’s discomfort.

Before the conclusion of surgery, the patient was given 10 carpules of Marcaine so that he would be numb all day and when the dentures were placed. Antibiotics were given before and after surgery, as well as an anti-inflammatory and a narcotic painkiller. By 5 p.m., the patient returned to the dental office, and the new dentures were seated.

At a post-op visit 3 days later, the patient stated that the procedure wasn’t as bad as he had anticipated. Examination revealed the implants held the dentures tightly and kept them from compressing the ridge. Our observation was that the patient had less pain than if he had no implants and just the immediate dentures. A visit 1 month later showed satisfactory healing of the tissue and a very satisfied patient (Figures 4-6).

Conclusion

The two articles presented in this series represent both the basic and advanced capabilities of MDI treatment. As both cases illustrate, MDIs provide dentists with a valuable tool for denture stabilization, proving versatile enough to be used in everyday cases or in very challenging treatments such as the one shown here.

Their affordability, small size, and minimally invasive nature give them capabilities that traditional implants simply can’t match.

Eleven years ago, skeptics of MDI treatments were numerous and vocal. I continue to know doctors who do not believe in MDIs, and that is, of course, their choice. However, I believe that in the not-too-distant future, MDIs will be as common as amalgams and offered routinely by most dentists. The benefits for patients are too great to overlook, and I believe that MDIs are one of the finest solutions you can offer to patients who have lost or are losing their natural teeth.

REFERENCES