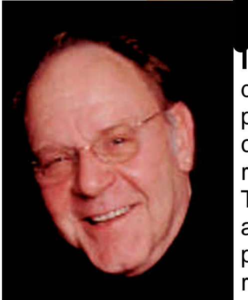
Clinical Realities

SPRING 2006

IMPLANT NEWSLETTER FOR CLINICIANS

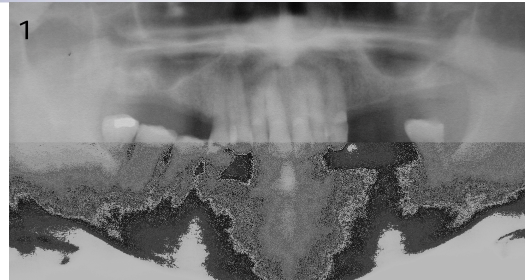
From the treatment records of **Paul P. Binon DDS, MSD**



Implants offer a wide diversity of applications provided the biomechanical aspects are respected.
They provide unlimited applications in solving prothodontic problems related to missing teeth, support and retention of a prosthesis. In this issue a basic application is presented that can be modified and has many variations. It offers predictable treatment solutions. As always the key is careful diagnosis and treatment planning along with the application of sound biomechanical principles.
Restoring a failed dentition is not much different than what a mechanical engineer or architect does when they consider load and stress distribution, anchorage and support be it in a building, a bridge, a dam or other physical structure. Good mechanics is always the basis for success and long term function. Having the privilege to travel to the far reaches of our planet, I am always in awe of the structures that remain intact after thousands of years of function. The aqueducts, Stonehenge, Easter island monoliths, the coliseum, the fortifications, the pyramids in Egypt and South and Central America, the temples, churches and buildings that remind us of our common human heritage and our need to build. The common ground in all is always good engineering and execution. The same is true of the mouth, only further complicated by the biologic: heredity, bone, muscle, temperature, moisture, corrosion, pH changes, bacteria and functional and para-functional loads and mechanics. How anything survives in the mouth is a testament to a higher being and mans ingenuity and tenacity to survive.
The basic rules are simple however and are covered adequately in dental education. Clinical practice and experience give further credibility and insight into their application.
Most of it is common sense and intuitive. Think out of the box and base it on sound engineering principles and it will survive. It's when we become arrogant and disregard the basic engineering principles that cataclysmic failure occurs. Always do what you know and know what you do. If you can't, refer it out.

CASE OF THE MONTH

A 63 yr old Asian woman was referred for evaluation and treatment since she could not function with removable partial dentures. She presented with 7 maxillary teeth and five mandibular teeth (18, 29, 30, 31 and 32). She wore an upper partial with reluctance and refused to wear the mandibular partial recently constructed due to pain, A/P instability, lack of retention and food collection. Periodontally, there were no serious issues. Hygiene was excellent. There was a hyperactive gag reflex and very large lingual tori were present in the bicuspid area. The distribution of the remaining teeth was problematic and occlusal contact without the upper RPD in place was limited to #'s 5/29. Due to attrition and posterior collapse, there was also a loss of VD. Medical considerations included controlled hypertension and diabetes. Apparently she had been seen by an other prosthodontist and oral surgeon and presented with treatment plans involving 6 to 8 implants which were beyond her economic ability. The initial patient interview was effectively biased against any implant treatment since no reasonable alternatives were presented to her.
Multiple treatment options for both dental arches involving implant and non implant supported prosthesis apply to this patient's situation and were considered. Conventional treatment in the upper arch was selected that consisted of splinted crowns on 5 & 6 and a single crown on 11. Both 5 and 11 had Mini Dalbo attachments and distal and lingual guide planes for a precision RPD with an anterior palatal strap. The attachments allowed for lateral stability and a rotational hinge to minimize the stress on the abutment teeth. The design also allowed for a progressive level of treatment, if additional stability was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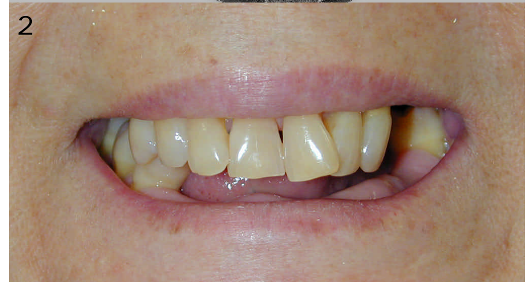
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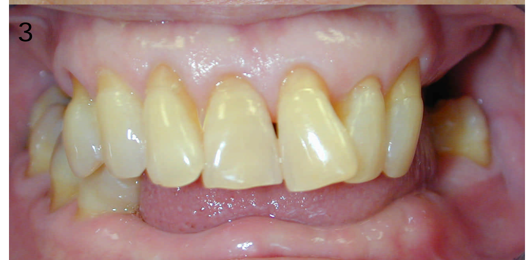
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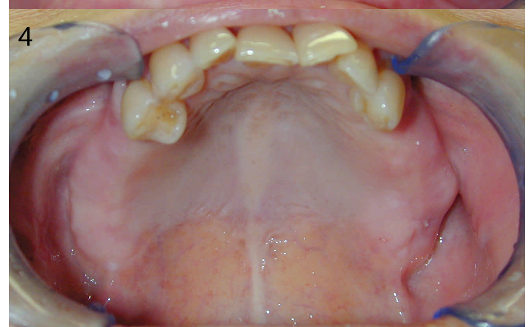
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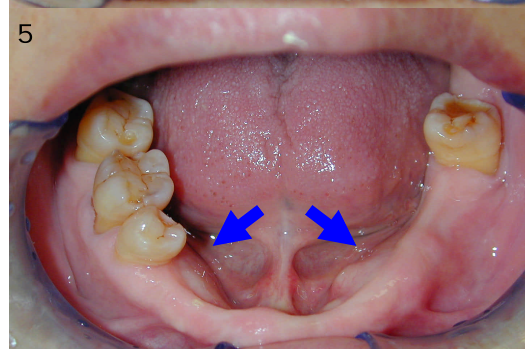
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IMPLANTS ARE THE STANDARD OF CARE

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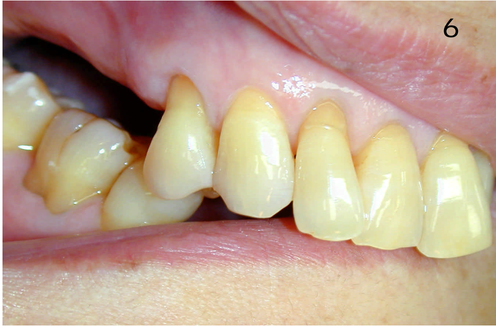
necessary, in the form of single implants in 3 and 14 locations as posterior stops in the future. This option was not exercised as adequate stability, retention and function was attained with the first level of treatment.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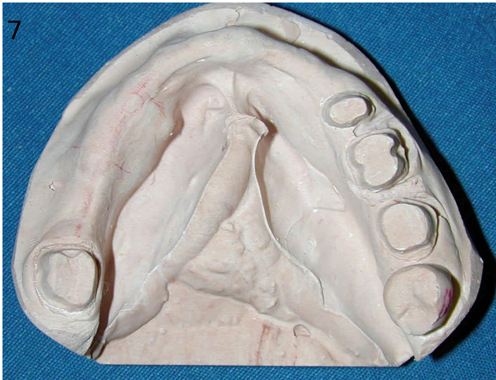
A variety of treatment options could be applied to the lower arch depending on patient expectations and economic considerations. Since a removable prosthesis offered significant economic advantages, the remaining posterior teeth would have to be modified to properly support and stabilize the projected RPD. Furthermore, the loss of VD due to occlusal attrition could be rebuilt and, at the same time, adequate inter-arch space could be regained.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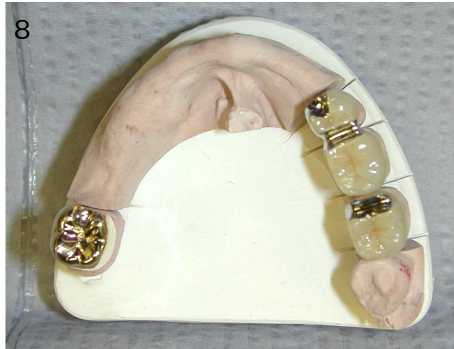
Additional support in the left sextant, to avoid rotational dislodgment of the prosthesis, was definitely necessary. The treatment plan of choice was as follows: Crowns on 18, 29, 30 and 31 with appropriate guide planes, rests and clasp retention undercuts, the placement of two implants in locations 20 and 22. This location was ideal due to the presence of the large tori. It allowed placement of 3.4 Xive implants of 15 and 11 mm respectively. The implants would be restored with a custom bar and two Locator attachments that could provide up to 10 Lbs of retention and excellent lateral stability.
Treatment sequence was as follows: **1)** Maxillary preps on 5, 6 and 11. **2)** Placement of the 2 implants. **3)** Insertion of the upper crowns and sequential appointments to complete the upper partial denture. **4)** Preparation of the lower teeth. **5)** Insertion of the crowns and an impression to start the RPD was made. **6)** While the framework was being made, the implants were exposed and an impression was taken to fabricate the bar in our office in house lab. The lower partial denture framework was designed with a built-in internal window to accommodate the bar and retentive elements. **7)** At the same appointment, the implant bar was inserted and the RPD frame was tested for accuracy and fit. A bite record and impression to complete the partial denture was made. At the next appointment, the partial was inserted.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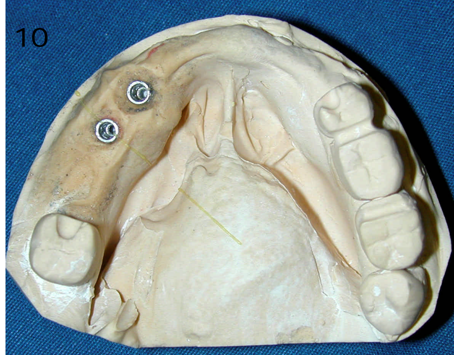
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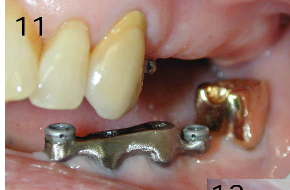
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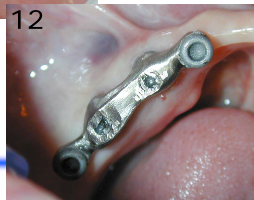
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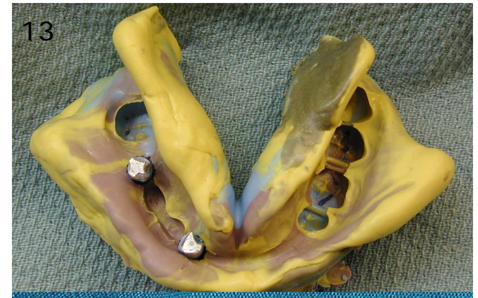
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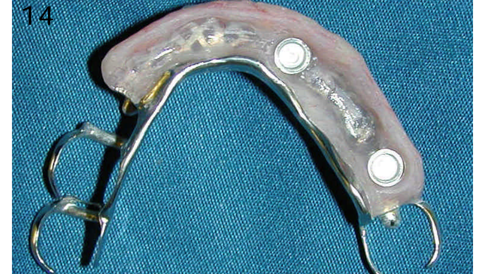
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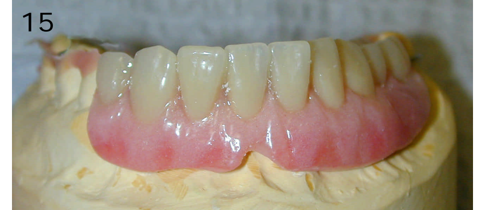
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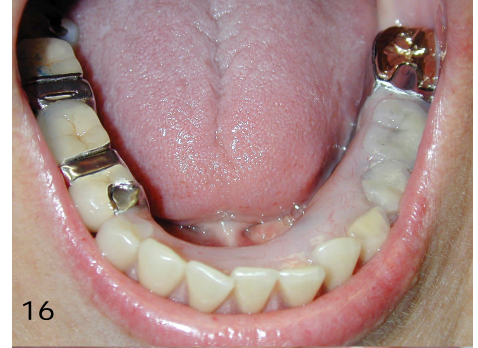
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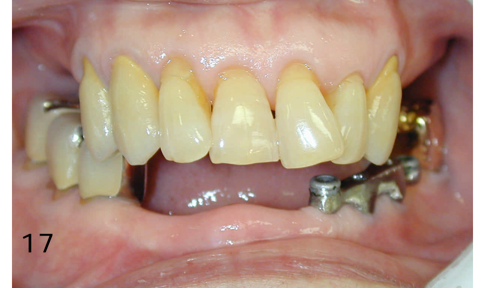
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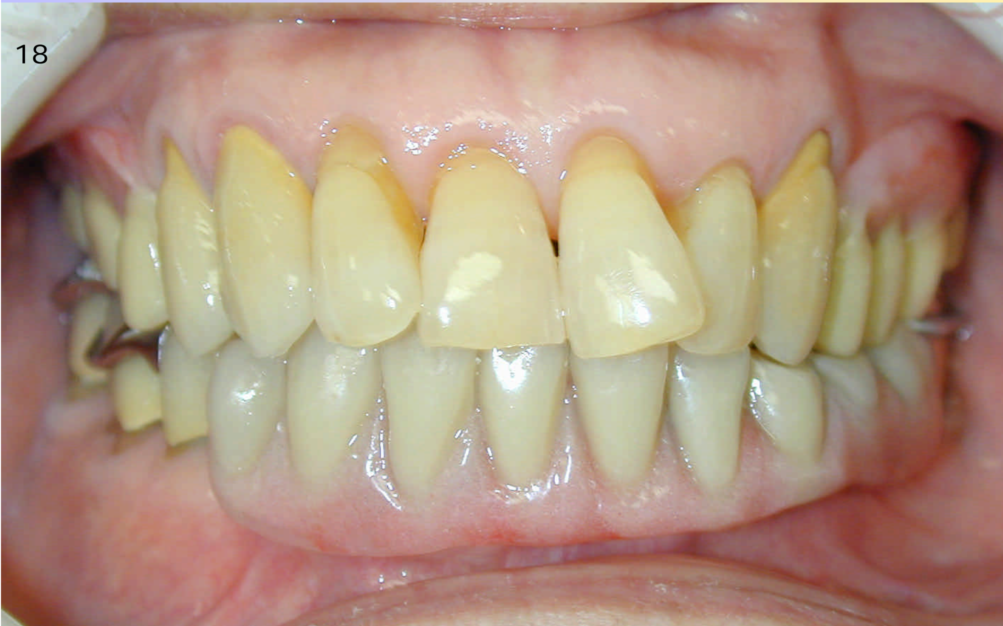
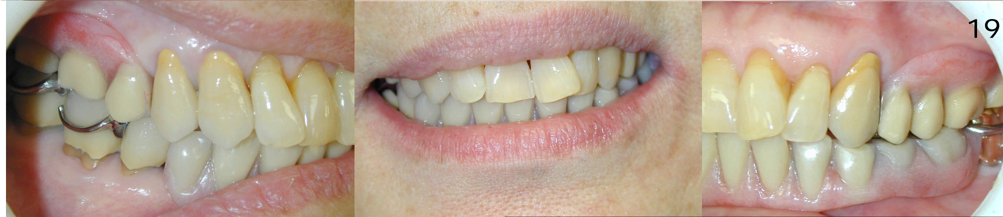
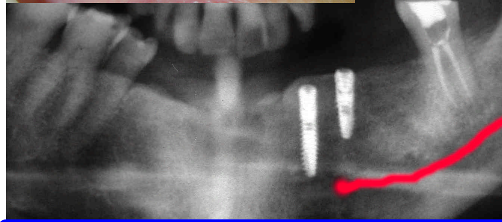
The patient has been pleased with the stability, retention, functionality and esthetics of the prosthetic treatment provided. At the present time only one Locator retention cup is active.
Key elements to success were an innovative treatment plan, appropriate design of the partial denture support and retention elements and, utilization of the proper number and location of dental implants. Biomechanics are critical when implementing an implant treatment plan.

COMPLETED TREATMENT



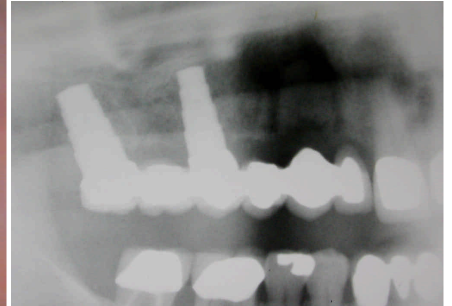




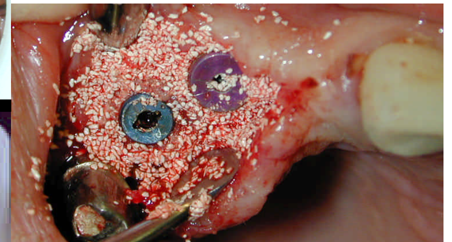
FAILURE !

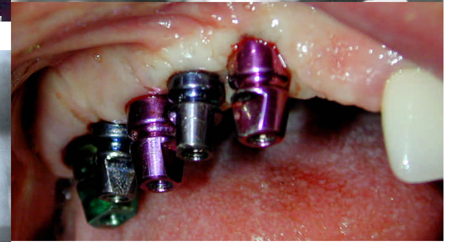
SECURING A SOLUTION

In 1999 I started a rehabilitation case and placed three implants in the maxillary right quadrant in order to secure a 6 unit fixed partial denture. The tooth borne bridge had failed due to extensive caries. Frialit tapered press fit implants were placed in locations 2, 4 and 6. The treatment was completed and functioned for **two years** without any indications of problems. On routine recall at 2 yrs, the #6 implant demonstrated total failure and was removed. Within a six month recall time, the implant was totally encapsulated with granular tissue. The resulting defect extended beyond the apex of the implant and some of the labial plate was gone. All the granular tissue was removed and the site was grafted with BioOss and autogenous bone

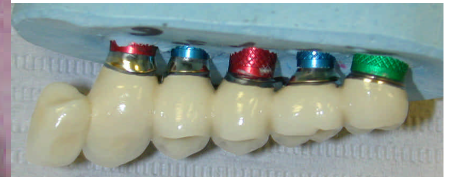


and a membrane.
Three additional implants were placed in sites 3, 5 and 6, allowed to integrate with the original FPD used as a temporary.

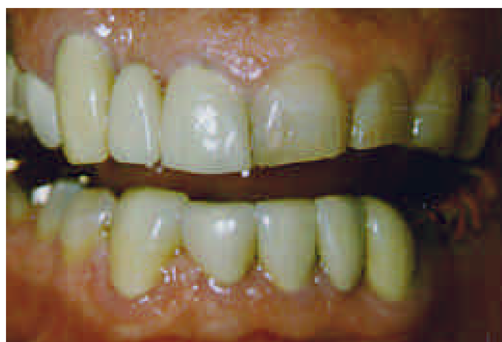




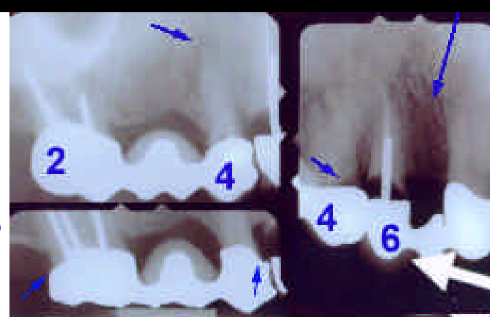
At second stage, a new FPD was constructed, using the 5 implants.



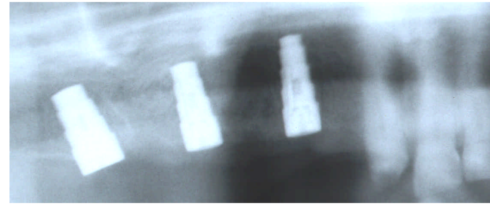
So, what were the reasons for failure in this case? **Delayed** failure appears not to be unusual with this implant although two of the 3 originally placed implants demonstrated no bone loss and functioned quite well during re-treatment.



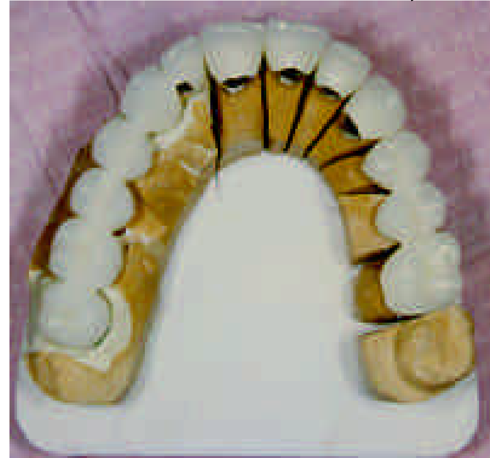
PRE TREATMENT VIEW 1999



PRE TREATMENT RADIOGRAPHS



INITIAL PLACEMENT—SITES 2,4 & 6



UPPER ARCH BEFORE INSERT

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Analyzing the reasons for an implant failure range from the very obvious to mere speculation especially when everything was done correctly. First, was it overload? Unlikely because the spacing was ideal, the implants were long (13 & 15mm) and with wide platforms (5.5 & 6.5mm). The CT scan showed adequate bone volume to support the size of these implants. Right from the start I ruled out overload since the remaining two implants demonstrated no bone loss and continued to support the original fixed bridge during the grafting and implant replacement sequence with no ill effects.
Was it occlusion? Patient demonstrated some clenching activity but was not a bruxer. The occlusal scheme for the bridge was group disclussion with the cuspid and bicuspids. If that was a contributing factor then the middle implant would have had bone loss as well and failed shortly thereafter.
Was it implant surface related? Its quite possible since there are clusters of late failures that have been reported by multiple clinicians with this implant design, however, there is no profound evidence at this time to support that.
Was it surgical technique? Placement of large diameter implants utilizing large drill diameters can generate more heat and detrimentally effect the viability of the osteotomy. All 3 of the implants placed were wide diameter so it would appear logical that if that were the case, all 3 would be effected.
Same is true if dull cutting instruments were used. The same instrumentation was used for all three placements. Therefore very unlikely.
Was it a combination of factors? This is the most probable explanation. Case in point, it is sometimes very difficult to isolate a specific factor that results in failure. It is therefore necessary to CAREFULLY track the implant cases for trends and complications related to surgery and restoration.

POST OP—RETREAT
3 YEARS FUNCTION

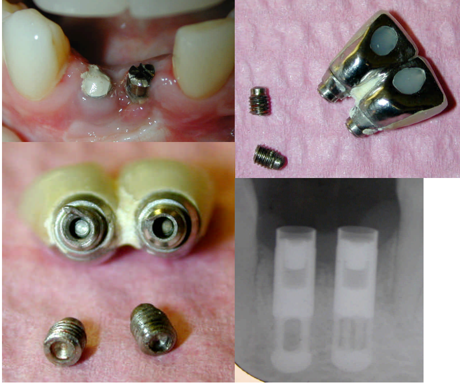
At a time when **EVIDENCED BASED DENTISTRY** is driving clinical decisions, there is still something to be said for "pit of your stomach" based decisions. I have experienced a number of these epiphanies during the past 23 years of clinical implant practice. In this case I stopped using tapered press fit implants and all implants now have to have threads and a blasted or etched roughened surface.

Cochran DL, Comparison of Endosseous Dental Implant Surfaces. J. Periodontol. 1999 Dec;70(12):1523-39

Treatment provided by PAUL BINON DDS, MSD. We provide surgical and prosthetic implant treatment .

OUR PARTS NEVER BREAK DEPARTMENT

These **IMZ** implants located in # 25 and 26 sites, had been in function for 10+ years.
They were restored with **splinted** screw retained PFM's. Unique to this case was that the typical system IME (intra-mobile element) or the titanium intermediate element were not used. Most likely because of the frequent problems and maintenance headaches encountered with these components. Instead, after market components were used to restore the case. These large "conversion" abutments fractured while the "prosthetic" retaining screws remained intact. The "fix" was easy. Measure the gingival collar and order replacement parts from 3i. Spinning out the screw ends was the challenge. If you damage the threads, inside the implant, its irreversible. Here, the same crowns could be replaced and the patient was happy.



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PAUL P. BINON DDS, MSD
PROSTHODONTICS / IMPLANTS
1158 CIRBY WAY ROSEVILLE, CA 95661
916-786-6676

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