Report

Redefining the gold standard

Steven Lewis[1]

As relatively early Brånemark System adopters in North America, our team at UCLA went full-speed into offering this treatment modality to patients with an edentulous arch. Proven predictability, accompanied by an extremely low potential for morbidity, gave rise to great working relationships between the surgeons, prosthodontists and dental technicians providing this new form of treatment. By the mid-1980s, Brånemark and his colleagues had developed a complete system of interrelated components for the treatment of the edentulous arch, which even made it possible to treat severe craniofacial defects resulting from trauma, tumor ablation or congenital disfigurement.

When treatment began to be offered to the partially edentulous patient, new clinical challenges were encountered that the available components were not designed to address. For instance, the partially edentulous patient sometimes presented with much less interarch space than the average edentulous patient.

At the time, the shortest trans-mucosal abutment available was 4 mm, and required a 4 mm gold cylinder on top of that to make a cast framework. Prosthetic complications arose because there wasn't always enough interarch space left to accommodate an adequate amount of restorative materials.

There were other problems too. In an attempt to provide an esthetic restoration in the maxilla, using the shortest 4 mm transmucosal abutment sometimes resulted in visually exposed titanium. Additionally, even when working with top surgeons, the occasional implant/abutment access hole ended up in an esthetically compromised position due to facially inclined implants.

It should be recognized that the Brånemark System, as introduced in the early 1980s, remains an ideal system today if used only to treat edentulous jaws with moderate to severe resorption; the fact that 15 years documentation for the maxilla and 20 years for the mandible were published, confirms the continued viability of Brånemark's design rationale and the durability of this treatment.

[1] *Dr. Steven Lewis*

Nevertheless, to meet the specific challenges mentioned earlier, the UCLA abutment, introduced in 1987, provided unique advantages. This component made it possible to bypass the standard abutments and gold cylinders of the day by bringing the restoration directly to the implant. With the UCLA abutment:

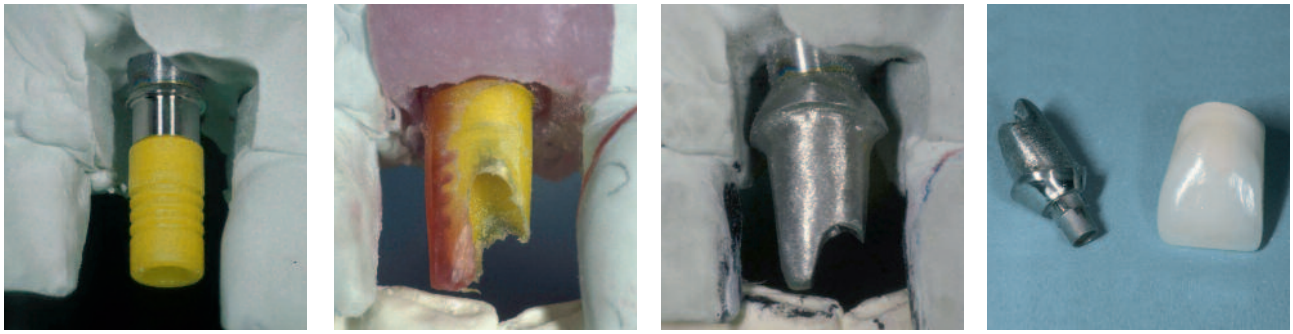
- single tooth restorations could be fabricated utilizing the implant hexagon;
- porcelain could be brought closer to the implant head;
- the occasional labial trajectory of a screw access hole (that might otherwise interfere with an esthetic outcome) could now be corrected with a cast abutment and a cemented crown covering the screw access hole; and
- less space was required in situations characterized by a limited interarch gap.

Looking back, it is a little surprising that what was designed at the time to be no more than a problem-solving expedient continues to be the primary treatment modality of many dentists and technicians to this day.

Perhaps practical aspects, especially from a dental technician's standpoint, are responsible for the continued widespread use of the UCLA abutment. After all, it makes it possible to take a "one size fits all" gold cylinder and then wax and cast any type of abutment design appropriate for single-tooth and multiple unit cemented restorations.

Despite this practical benefit and the fact that I am a member of the team that originally developed the UCLA abutment technique, I use it only rarely today. I still prefer to do screw-retained restorations whenever feasible, but because the multi-unit abutment of today has advantages in both collar height and interarch clearance dimensions over the original standard abutments, I find it a compelling choice. What's more, there are also angled abutments at our disposal today that had not yet been developed in the mid-1980s when the UCLA abutment was first introduced.

For most screw-retained solutions today, choose multi-unit abutments and a NobelProcera milled titanium framework rather than UCLA abutments.



UCLA abutment approach: *With a GoldAdapt as foundation, the abutment cylinder is modified and added to with wax, which is then burned out and cast to produce the abutment for a cemented crown. With a stock component and wax, any abutment design can be produced that is mechanically compatible.*

The UCLA abutment had its day

For single teeth and short-span cementable restorations, the UCLA abutment did allow varied abutment designs and made it possible to design abutments to look like prepared teeth, which was especially useful for the occasional misaligned implant that needed a cemented crown or bridge.

On the other hand, when these cast gold abutments extend 4 mm or deeper subgingivally, soft tissue seldom appears as healthy as in shallower situations. This should not come as a surprise. The work of Abrahamsson and others demonstrates that one doesn't get the same epithelial attachment to gold as to titanium, aluminum oxide or zirconia.

Given the fact that NobelProcera can provide customized abutments made of titanium or zirconia, making it possible for virtually any design to receive a cementable crown or bridge, there is really no longer any justification for settling for the lesser biocompatibility of gold in these subgingival sites. Today I use only NobelProcera CAD/CAM custom titanium or zirconia abutments for these cementable applications.

When presented with a new case, I always ask myself, "What is the best way to restore this patient functionally, esthetically and biologically?"

As I answer this question and choose my materials, I find myself moving away from metallic gold towards a new gold standard: NobelProcera.

More to explore

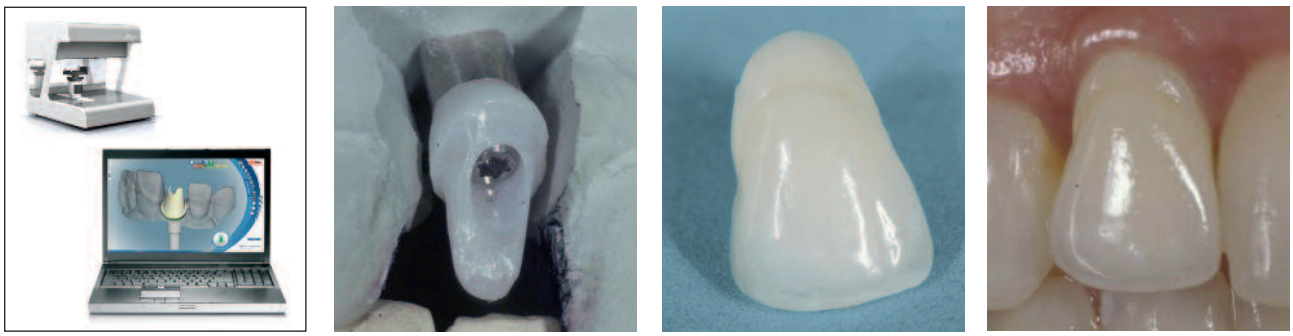
"Implant treatment in the edentulous maxillae: a 15-year follow-up study on 76 consecutive patients provided with fixed prostheses," by T. Jemt and J. Johansson, in Clin Implant Dent Relat Res. 2006; 8 (2): 61–9

"Implant Treatment in the Edentulous Mandible: A Prospective Study on Brånemark System Implants over More than 20 Years," by J-A Ekelund, L. Lindquist, G. Carlsson, G and T. Jemt, in Int J Prosthodont. 2003; 16: 602–608. "Single Tooth Implant Supported Restorations," by S. Lewis, J. Beumer, G. Perri and W. Hornburg, in Int J Oral Maxillofac Implants.1988; 3: 25–30.

"The mucosal attachment at different abutments. An experimental study in dogs," by I. Abrahamsson, T. Berglundh, PO Glantz and J. Lindhe in J Clin Periodontol. 1998 Sep; 25 (9): 721–7.

"The mucosal barrier at implant abutments of different materials," by M. Welander, I. Abrahamsson and T. Berglundh in Clin Oral Implants Res. 2008 Jul; 19 (7): 635–41.

This article is a reprint from Nobel Biocare News Vol. 13, No. 1, 2011.



NobelProcera CAD/CAM approach: *A dental technician can use either a scan of an abutment design or complete virtual process to produce an abutment in either titanium or zirconia. With design possibilities matching the UCLA abutment, more biocompatible materials are able to be used, with the added possibility of shaded zirconia for esthetics.*