

Spectrum Dental Science, Inc. introduces high-strength zirconia crowns and bridges

RESTORATIVE CHALLENGE: A 41-year-old female dental assistant presented with asymptomatic failing amalgams on teeth #18 and #19. The amalgams were very large with deteriorating margins (see Figure 1). The patient wanted to replace these fillings with more esthetic restorations.

Dental team: Brian Johns, CDT, Spectrum Dental Science Inc., Union, Nebraska; and Dr. Michael Sesemann, DDS, Nebraska Institute of Cosmetic Dentistry, Omaha, Nebraska

Treatment plan: The team decided to fabricate two crowns using CEREC inLab VITA YZ material (yttrium-stabilized zirconium oxide) that offers high tensile strength, fracture toughness, flexural strength of up to 1100MPa and esthetics. The material has the ability to transmit light but still block the underlying tooth color, and the VITA YZ colorable cores allow you to achieve a range of shades. The material can also be cemented conventionally.

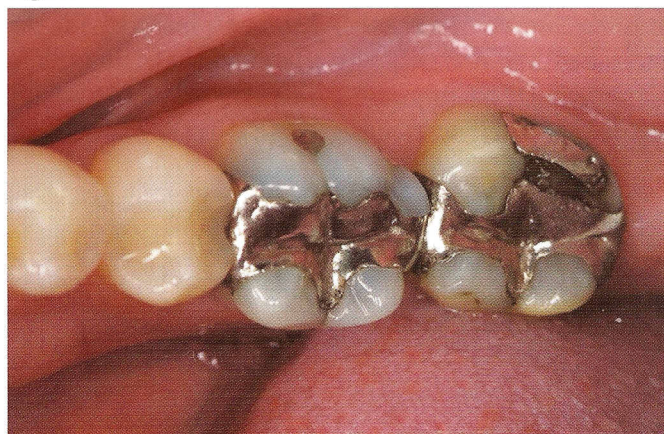
Case study: Pre-operative impressions were taken. After evaluating the patient, Dr. Sesemann removed the amalgam material and found cracking and decay of the existing

tooth structure. The teeth were then prepared with a conservative full-crown preparation (see Figure 2). The margins were placed supragingivally and final full-arch impressions were taken.

At the lab, the pre- and post-operative impressions were poured and mounted on a Stratos articulator, while another set of dies was poured out of a scannable die stone and read by the CEREC inLab system's laser. While the software can automatically plot and mill the margin, Brian Johns chose to plot the margin himself due to the supragingival preparation. He plotted it short of the actual margin to allow room for the porcelain shoulder; the software then proposed a framework design. This adjustment eliminated any demarcation at the margins and would allow the doctor to etch and bond the shoulders.

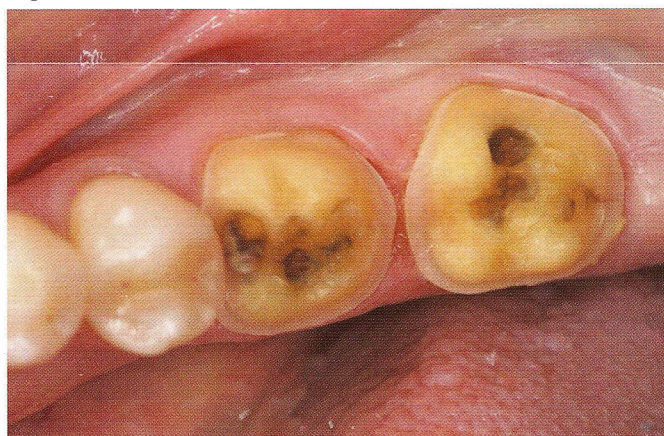
The information was then sent to the in-house milling unit. After milling was complete (see Fig-

Figure 1



The patient's failing amalgams and deteriorating margins on teeth #18 and #19.

Figure 2



The conservative full-crown preparation.

The CEREC inLab VITA YZ material can be cemented conventionally.

ure 3), Johns loaded the partially sintered copings into the sintering furnace for six hours. (To ensure a precise fit, each block contains a scannable bar code that tells the software how much shrinkage the framework will undergo in the sintering process. The software then mills the framework slightly larger to compensate for this shrinkage.)

After cool down, Johns fit the copings to the working model and checked them against the master model; they required minimal adjustment. He applied bonder and established the porcelain shoulders, then applied VITA D-based dentin and

incisals—underbuilding slightly—and fired the restorations. He used a set stain technique for characterization and performed the final buildup using dentins and transluents (*see Figure 4*). He contoured the restorations to form, and glazed and hand-polished with flour pumice to achieve a high luster (*see Figure 5*).

Dr. Sesemann etched the margins and tried in the crowns. Following the fit evaluation, no adjustments were necessary and he bonded the crowns into place (*see Figure 6*). He was pleased with the marginal fit and the patient was very satisfied with the esthetic results.

The team decided to fabricate two crowns using **CEREC inLab** VITA YZ material (yttrium-stabilized zirconium oxide) that offers **high tensile strength**, fracture toughness, flexural strength of up to 1100MPa and esthetics. The material has the ability to **transmit light** but still block the underlying tooth color, and the VITA YZ colorable cores allow you to achieve a **range of shades**.

FOR MORE INFORMATION

on how you can offer high-strength
zirconia crowns and bridges,
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Figure 3



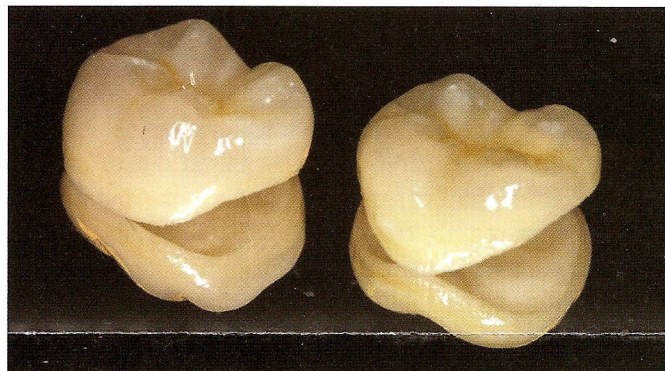
The milled coping.

Figure 4



Final buildup with dentins and transluents.

Figure 5



The final restorations were hand polished for a high luster.

Figure 6



The bonded crowns.