



P.F.Z. Clinical Trial with Ceramic 3D Printer, ZIPRO

by Dentist, Mr. Daehyun Gil

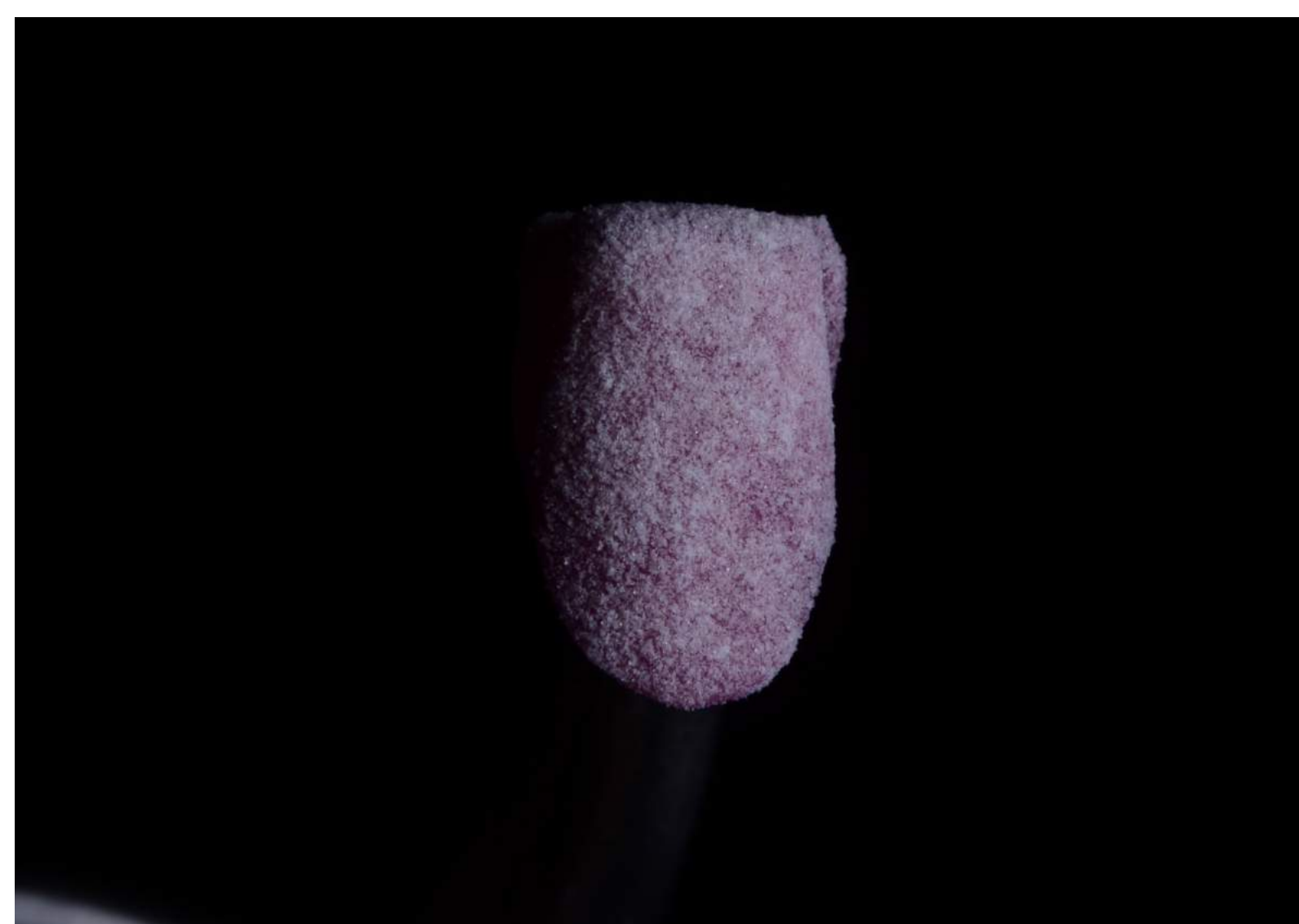
- Graduated from Seoul National University, majored in Dentistry with BS, Master's degree
- Representative dentist for Guemplant Dental Hospital in Seoul, South Korea

Case Study

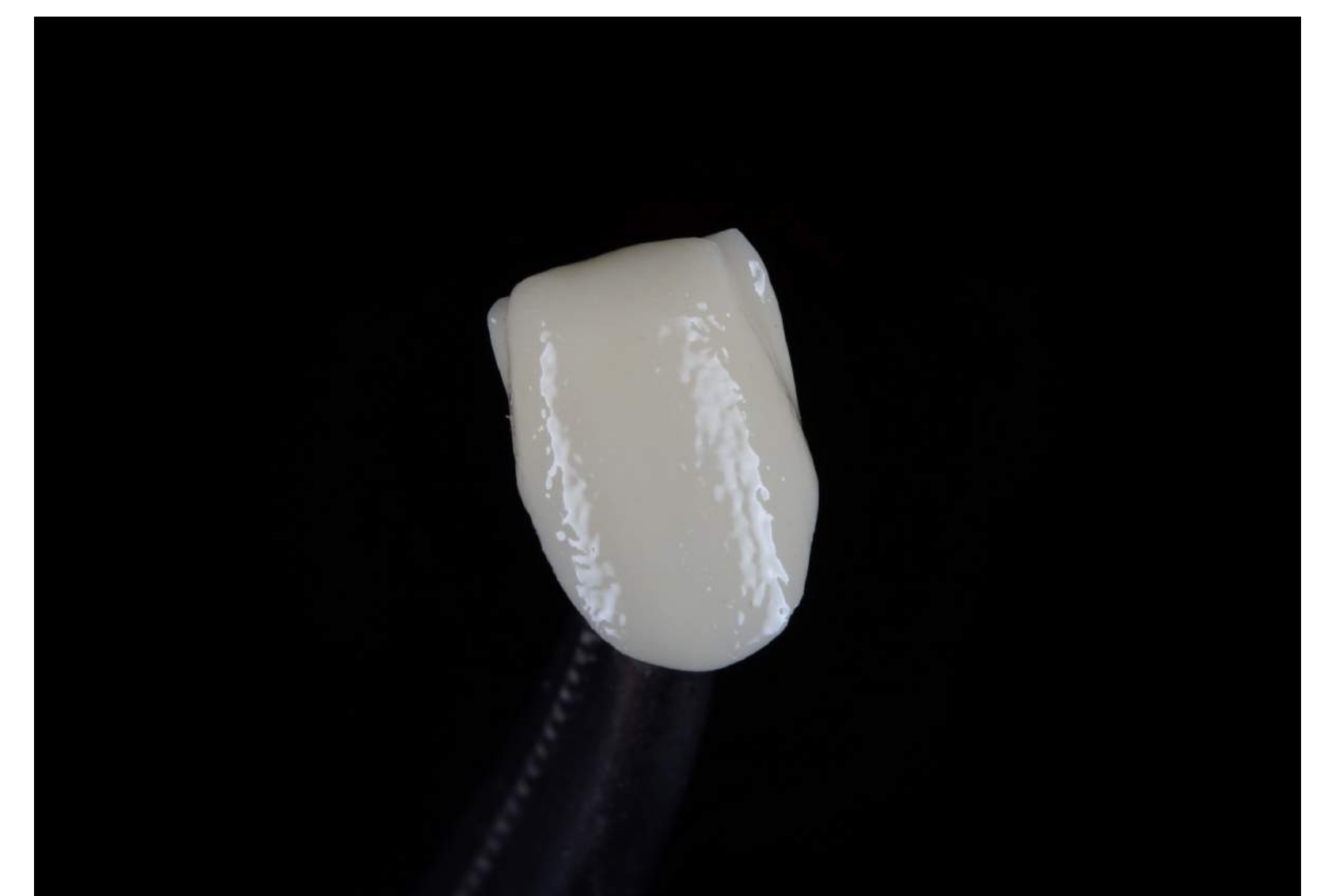
This study is for a maxillary lateral incisor. I have produced the P.F.Z. incisor with using the core 3D-printed by ceramic 3D printer rather than the existing milling machine.



(Figure1-1) Cohesion Test



(Figure1-2) Adhesive and Foundation



(Figure1-3) Completion of Sintering

[Production Process and Material]

AS ZIPROS, the slicing software accompanied with AON ZIPRO completely caters for automatic placement of supporting parts, I could save my time and efforts in manually setting up the supporting parts.

I 3D-printed the test objects with the ceramic 3D printer, ZIPRO made by AON Co., Ltd. and the printing time for the coping was about 2 hours while the crown was taken about 2 hours and 20min. The Zirconia slurry, INNI-CERA is the class-2 medical material approved by Korean Ministry of Food and Drug Safety and its strength is 800MPa on average suitable for dental restorations. Since the core object was produced by ceramic 3D printer rather than the milling machine, I have tested the cohesion between the porcelain and the core first and additionally applied the Adhesive Foundation work to get more cohesion as shown in Figure 1-1, 1-2, 1-3.

As ZIPRO 3D printer enables end-users to produce the core object in both of white or shade color, I could easily produce it in the same shade color as that of patient's tooth. I have picked up A2 shade color this time.

I could anticipate the effect of color tone blocking of discolored tooth thanks to low transparency of Zirconia material.

I have performed the same buildup and contouring process as I have done for the previous clinical trial.



(Figure 2-1) Shade Core



(Figure 2-2) Blocking Test for White Core Discoloring



(Figure 2-3) Blocking Test for Shade Core Discoloring

Installation Trial with Shade Core

The target shade was for dental restoration in A3.5 level's brightness and chroma. When applied A2 shade core for the dental restoration, I could implement the perfect coloring in appearing perceptual depth of shade and high chroma even at a tiny space of 1mm.



(Figure 3) Installation Trial with Shade Core

[Conclusion]

Zirconia dental restoration is becoming the mandatory rather than the optional when the digital era comes along.

Zirconia dental restorations by ceramic 3D printer is breaking through the limits of conventional milling machine and this is the reason why it is significantly highlighted today. Zirconia dental restorations by ceramic 3D printer will innovatively save the production time of dental restorations. Moreover, it is likely to implement the enhanced adaptations because it reduces the space between the crown and the core inavoidably occurred by the adjustment of grinder diameter upon milling. Later on, if Zirconia dental restorations by 3D printer with the enhanced transparency comes out in the market, to produce a aesthetic Zirconia crown completely 3D-printed is likely to be feasible. I look forward to AON's upcoming movements with ZIPRO, ceramic 3D printer.