Long-term comparison of acrylic vs. ceramic All-on-4® fixed dentures

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Video Abstract

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Abstract

Dental implants have improved a lot in recent years. People who have lost their natural teeth can now get fixed dentures, and with the All-on-4® approach, dentists can replace the entire top or bottom set of teeth with just four screws in one visit. But few studies have investigated the long-term success of these fixed dentures, and whether the cheaper acrylic versions work as well as the more expensive ceramic ones. Researchers in Germany and Turkey have now compared both options over a five-year period, offering an unprecedented look at how these dentures hold up over time. The dentists recruited 29 patients who opted for either acrylic or ceramic fixed dentures, and evaluated them before and after surgery on a variety of measures. Overall, both types of dentures performed similarly in patients. Bone loss, for instance, increased in both groups over the years, as expected, but was relatively minimal, and low enough to easily be considered successful. Patients' oral health-related quality of life also went up. As measured by the Oral Health Impact Profile, in which higher scores indicate problems, the both dentures essentially eliminated any impairment as soon as they were installed, and over time relatively few issues developed. Bite force, which was measured for the first time with pressure film, also increased, and remained strong over time, although by the fifth year the ceramic dentures had a slight edge. These results are consistent with previous reports suggesting that both fixed dentures are highly effective, and that if costs are a concern, acrylic dentures are a fine choice. But the team also identified a concerning increase in sulcus flow in the acrylic dentures after about 3 years. Higher rates of flow are linked to more inflammation and eventual bone degradation. The findings suggest that given more time, acrylic dentures may prematurely fail. The acrylic dentures also showed more abrasion, and in a quarter of patients, veneers cracked, while the ceramic ones remained intact. These problems indicate that the lower cost of the acrylic dentures may not be worth it long-term. Even longer follow-up in future studies may help answer whether ceramic dentures are the superior choice.