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Long-term observation of a case where an immediate implant placement was performed at the time
of tooth extraction in the anterior maxilla
– Chronological change in level of gingiva and alveolar bone –

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Good morning/afternoon, ladies and gentlemen. My name is Yoshinori Ono.

I would like to start by sincerely thanking Dr. John Williams, the dean of Indiana University School of Dentistry, professor Yoshiki Oshida, professor Vanchit John, and the Faculty of Indiana University, for giving me this opportunity to share my case study with you here today.

Without further ado, let me start my presentation titled "Long-term observation of a case where an immediate implant placement was performed at the time of tooth extraction in the anterior maxilla."

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Purpose

After one or more teeth are extracted in the anterior maxilla, the alveolar bone reduces in height and width as the extraction socket heals, and therefore it is common in clinical settings to encounter cases in which it is difficult to restore the aesthetics and functionality with dental implants. To avoid these difficulties, an immediate implant placement at the time of extraction is becoming the mainstream in Japan, but its effectiveness has not been proven because there have been almost no studies on the long-term effects. I wonder how the immediate implant placement method has been received in the United States. I am greatly interested in it, and I would like to learn more about the latest dentistry in the United States.

In this study, I performed an immediate implant placement at the time of tooth extraction in my clinic, aiming to obtain better aesthetics and functionality of the site in the anterior maxilla, and obtained satisfactory results for a long time.

Let me report the case.

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Outline of the case

The patient was a 53-year-old female when she visited our clinic in June 2003. 3 years earlier she had had a crown with hard-type resin facing put on the right maxillary central incisor at another clinic, but the crown had come off. She asked me to improve the aesthetics and functionality of the site. Her general condition was fine, and no medical condition requiring special mention was observed, such as a history of smoking.

She was reluctant to have the adjacent natural teeth on both sides cut down as a treatment option for improving the aesthetics and functionality of the site after extraction, so she chose implant placement.

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This slide shows the oral cavity and dental X-ray before the surgery. The gingival tissue covered the root of the right maxillary central incisor, and no inflammation was seen at the site. In addition, the depth of each periodontal pocket of the remaining tooth was less than 3 mm, and there was no bleeding or discharge of pus during periodontal probing. The diagnosis was that tooth extraction was indicated, because the dental X-ray revealed a horizontal fracture, probably caused by bruxism during sleep at night, at the center of the root. On the other hand, morbid transmitted X-ray imaging was not observed at the apex or around the root of the site.

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According to the treatment plan, the right maxillary central incisor was extracted and an implant was placed immediately afterward in July 2003. The tooth was carefully extracted with a periosteal elevator to avoid fracturing the alveolar bone on the labial aspect of the extraction socket. As a result, healthy alveolar bone about 2 mm thick was preserved on the labial aspect of the extraction socket. I made an entry divot closer to the palatal aspect, and then created and enlarged the hole along the compact bone of the palate, preserving as much bone tissue on the labial aspect as possible.

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Regarding the position of the fixture, I made sure that the labial aspect of the implant platform was 2 mm palatal to the widest point of the contour on the labial aspect of the tooth to be restored. Setting a point of reference to determine the apicocoronal position of the platform at 2 mm apical to the cemento-enamel junction (CEJ) of the left maxillary central incisor, the bilaterally corresponding tooth, I made sure that the biological width of the implant was achieved. The gap between the extraction socket and the implant was firmly filled with bone chips harvested from the drilling, and then the mucoperiosteal flap was stitched up.

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This slide shows the oral cavity and dental X-ray 6 months after the surgery (in January 2014). Because the gingiva corresponding to the right maxillary central incisor was located more coronally, I gradually added self-curing resin at the base of the provisional restoration by the brush-on technique to harmonize the anatomy of the gingival margin.

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This slide shows the oral cavity 10 and 20 days after the provisional restoration was placed. I added resin carefully and pressed it repeatedly to prevent the gingival mucosa from becoming necrotic.

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One month after the provisional restoration was placed, I confirmed that the anatomy of the gingival margin of the site corresponding to the right maxillary central incisor was aligned with those of the adjacent teeth on both sides, and then took the final impression.

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When taking the final impression, I made sure that the soft tissue anatomy at the base of the provisional restoration would be exactly represented on the final model, using a custom-made impression coping, with silicone impression material used to take the impression of the soft tissue at the base.

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A ceramo-metal crown, the final prosthesis, was placed in April 2014. I instructed the patient to wear a dental night guard during sleep to prevent bruxism.

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This slide shows the oral cavity and dental X-ray in January 2015, 10 years and 9 months after the final prosthesis was placed. Inflammatory bone resorption was not observed in the alveolar bone around the fixture, and sufficient osseointegration was maintained. Since the final prosthesis was placed, dental maintenance including plaque control and check-up on occlusion has been performed every three months.

<Slide 13> Chronological change in interdental papilla and marginal gingiva

This slide shows a chronological comparison of the conditions of interdental papilla and marginal gingiva. The interdental papilla and the marginal gingiva have been maintained at the same height as

those of the adjacent teeth on both sides.

<Slide 14> Discussion and conclusions

I performed an immediate implant placement at the time of tooth extraction in the anterior maxilla, and managed to improve the aesthetics and functionality of the site. Immediate implant placement at the time of extraction was highly effective in preventing absorption of the alveolar bone and recession of the marginal gingiva after extraction and in placing the final prosthesis intended for aesthetics and functionality. However, healthy alveolar bone at least 2 mm long must be preserved on the labial aspect after extraction, and sufficient initial stability must be achieved at the time of fixture insertion. I intend to keep observing this case carefully for a long time.

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With that, I would like to close my presentation. Thank you for listening.