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Peri-implant osteonecrosis of the jaw in a patient prescribed selective estrogen receptor modulators

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In an aging society, medication-related osteonecrosis of the jaw (MRONJ) has become a problem as the use of osteoporosis medications increases. Long-term use of bisphosphonates and bone resorption inhibitors such as denosumab is reported to have a significant impact on the development of MRONJ.[1,2] However, there are many unknown causative factors and a lack of information and evidence to conclude that other drugs do not also cause the disease. We report a case of peri-implant ONJ in an older diabetic patient who used a selective estrogen receptor modulator (SERM) after implant placement and discuss its etiology.

A 62-year-old female patient attended our hospital for treatment of periodontal disease. Four implants were placed in the upper and lower molar regions in 2006, and maintenance has continued at intervals of several months (Fig. 1A and B). The patient developed thyroid cancer at 68 years of age, and oral alendronate (a bisphosphonate) was used to treat hypercalcemia and osteoporosis due to hyperparathyroidism. Four years later, MRONJ developed around a previously healthy maxillary implant.[3] For this reason, the bone resorption inhibitor was changed from bisphosphonate to raloxifene hydrochloride starting in 2017. The patient complained of discomfort of the #36 implant in 2023, and it was determined that the implant could not be saved (Fig. 1C and D). Peri-implant bone was resorbed, and bone tissue attachment was observed on the surface of the easily removed implant (Fig. 1E, F and G). After sequestrectomy, the #35–#36 connected porcelain fused to metal crown of the superstructure was retained after repairing the #36 section. One year postoperatively, the peri-implant tissues were healthy.

Recent position papers have reported that MRONJ may be caused by SERMs as well as angiogenesis inhibitors and immunosuppressants (methotrexate), although the evidence is weak.[1] The patient previously had MRONJ in the maxilla, and the present ONJ around the #36 implant occurred 6 years after the change from alendronate to raloxifene hydrochloride, a SERM. Therefore, it is unlikely that residual BPs in the bone tissue could have been the cause. Raloxifene hydrochloride selectively acts on female hormone receptors and inhibits bone resorption by suppressing osteoclast differentiation and maturation.[4] It is speculated that changes in the bone remodeling effects of SERMs, as well as other bone resorption inhibitors, affect the local microcirculation and alter nutrient supply. However, this cannot be confirmed because few case reports of SERM users exist.[5] Because this was not a typical case of MRONJ, we diagnosed it as peri-implant osteonecrosis of the jaw that occurred during SERM use. Peri-implant tissues have a weaker immune system than that of natural teeth, and the progression of the lesion in this

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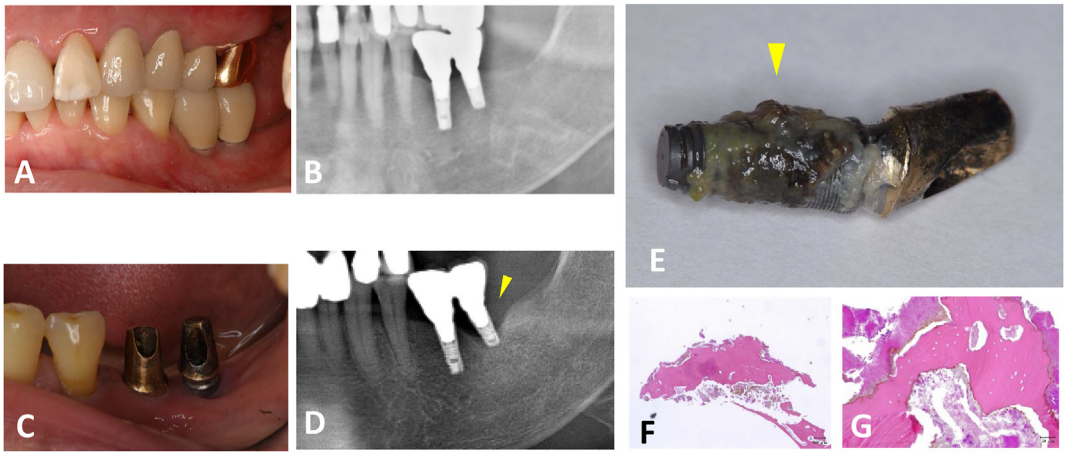

Figure 1 Radiographs, clinical photographs, and histopathologic images of a 78-year-old woman with peri-implant ONJ. (A) Prosthetic device at #36 (Micro Thread 4.5ST, Astra Tech AB, Mölndal, Sweden) (2007). (B) Orthopantomographic images taken during maintenance (2010). Bone levels around the implants are healthy. (C) Superstructure of #36 has been removed, revealing redness and recession of the surrounding mucosa (2023). (D) X-ray image taken on the same day. Diffuse bone resorption is evident around the implant (arrowhead). (E) Bone-like tissue measuring 2 × 5 × 2 mm was adhered to the rough surface (arrowheads), and the implant body was covered with plaque. (F) Histopathological image of the excised hard tissue. Many bacterial colonies can be seen in the surrounding area (hematoxylin and eosin; 20 ×) (G) Sequestrum can be seen, obscuring the layered structure of the bone tissue (hematoxylin and eosin; 40 ×).

case may have been caused by the susceptibility to infection caused by diabetes mellitus. In older patients, osteoporosis medications are often prescribed after implant placement. Therefore, to prevent ONJ, it is important to constantly monitor medication and physical condition changes, and to strictly control bacterial infections in the oral cavity.

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Tona Yoshino
Implant Dentistry, Nihon University School of Dentistry Dental Hospital, Tokyo, Japan
Department of Oral and Maxillofacial Surgery I, Nihon University School of Dentistry, Tokyo, Japan

Keisuke Seki*
Implant Dentistry, Nihon University School of Dentistry Dental Hospital, Tokyo, Japan
Department of Comprehensive Dentistry and Clinical Education, Nihon University School of Dentistry, Tokyo, Japan
Division of Dental Education, Dental Research Center, Nihon University School of Dentistry, Tokyo, Japan

Maki Nagasaki
Department of Oral and Maxillofacial Surgery I, Nihon University School of Dentistry, Tokyo, Japan
Department of Comprehensive Dentistry and Clinical Education, Nihon University School of Dentistry, Tokyo, Japan

Atsushi Kamimoto
Implant Dentistry, Nihon University School of Dentistry Dental Hospital, Tokyo, Japan
Department of Comprehensive Dentistry and Clinical Education, Nihon University School of Dentistry, Tokyo, Japan
Division of Dental Education, Dental Research Center, Nihon University School of Dentistry, Tokyo, Japan

*Corresponding author. Implant Dentistry, Nihon University School of Dentistry Dental Hospital, 1-8-13, Kanda-Surugadai, Chiyoda-ku, Tokyo, 101-8310, Japan.
E-mail address: seki.keisuke@nihon-u.ac.jp (K. Seki)

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