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Perigraftitis in a dental implant patient with treated breast cancer: A case report with histological assessment

KEYWORDS

Alveolar process;
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Contemporary implant treatment often involve guided bone regeneration (GBR) utilizing bone grafts and barrier materials to reconstruct bone defects around dental implants. While this approach has demonstrated long-term clinical success, sporadic cases of late graft infections have raised questions regarding their impact on normal bone metabolism.^{1,2} To our knowledge, no such report has been documented domestically. We hereby presented a case of late graft infection in a patient with a history of breast cancer treatment.

A 66-year-old female visited our department complaining of pain around upper right posterior implants placed approximately six years ago. Her medical history included breast cancer surgery followed by chemotherapy, radiation therapy, and ongoing use of letrozole, an aromatase inhibitor. Clinical findings were a foreign body embedded in the gingiva next to the right maxillary second molar implant, and mobility noted over the right maxillary first molar implant (Fig. 1A and B). Peri-implantitis with sequestered bone graft of implants 16 and 17 was diagnosed based on the clinical and radiographic findings (Fig. 1C and D), and implants removal with simultaneous GBR was performed under the patient's consent (Fig. 1E and F). The foreign body was sent for histopathological examination and revealed a composite

mixture of unknown bone graft intermingled with sequestered newly formed bone and bacterial colonies (Fig. 1H).

The term "perigraftitis", introduced by Do in 2022,¹ describes infected bone grafts causing inflammation in surrounding tissues. He speculated that minimally resorbed grafted bone may have altered bone metabolism, rendering it susceptible to bacterial infection during peri-implantitis development, as supported by Testori and coworkers.² Another theory postulates reduced mechanosensory function in bone grafts containing significant residual biomaterials.³ In our case, the patient couldn't recall the specific bone graft material used during the initial treatment, but microscopic observation suggested that it was minimally resorbable, as it persisted for years. Additional risk factors for our patient included a history of chemotherapy and use of aromatase inhibitors. Although previous literature indicates that only head and neck radiation therapy significantly lowers dental implant survival rates compared to chemotherapy.⁴ However, chemotherapy has the potential of bone marrow suppression resulting in leukopenia, thrombocytopenia, anaemia, and weakened immune responses. The aromatase inhibitor, prescribed to reduce circulating estrogens in breast cancer patients, has also been associated with increased attachment loss and higher pro-inflammatory cytokine levels.⁵

Given the aging population, oral surgeons increasingly encounter patients with a combination of systemic conditions. This case highlights a rare occurrence of late graft infection in a patient with a history of breast cancer treatment and dental implants. It is the author's hypothesis that a "composite" tissue composed of regenerated bone and minimally resorbed graft particles might potentially impair normal bone functions, making it more susceptible to infections,^{1–3} especially when combined with other immunocompromising factors, as observed in this case. Dentists and oral surgeons should be vigilant when treating patients with a combination of systemic conditions and

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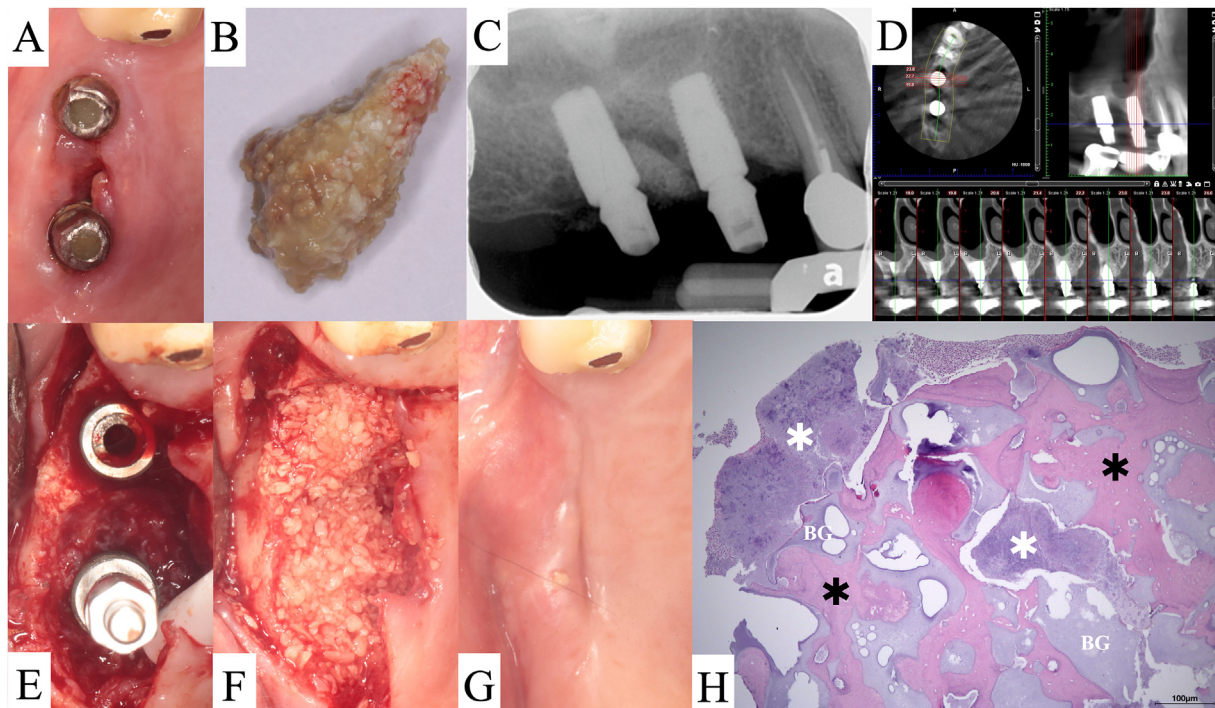


Figure 1 Clinical, radiographic, and histological photographs of our case. (A) Intraoral examination revealed a yellowish hard mass extruding from the gingiva mesial to implant 17. The removal of the hard mass resulted in a deep gap in the gingiva. (B) The removed pyramidal-shaped mass. (C) The periapical film taken before removing the hard mass. (D) Cone-beam computed tomography (CBCT) taken after removing the hard mass revealed extensive bone loss over implants 16 and 17; thus, it was decided to remove both implants. (E) After flap reflection, implant 16 was removed using trephine bur and dental extraction forcep, while implant 17 was removed using trephine bur and reverse torque wrench. (F) Guided bone regeneration was performed using freeze-dried bone allograft (FDBA) and collagen membrane for better ridge dimension maintenance. (G) After 3.5 month of follow-up, the height and width of the alveolar ridge appeared to be well maintained. (H) Histological analysis of the removed foreign body revealed a composite mixture of an unknown bone graft (suspected to be minimally resorbable, BG), sequestered newly formed bone (black asterisk) and bacterial colonies (white asterisk). (Hematoxylin and eosin stain; original magnification, $10 \times$).

consider the potential impact of graft materials on the implant health.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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