



Clinical and Histological Characteristics of Failed Dental Implants: A Prospective Cohort Study

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Background

- ✓ Implant therapy shows high survival rates, but failures still occur
- ✓ Implant removal may be required due to biological or mechanical complications
- ✓ Limited histological data on failed implants after removal

Aim

To evaluate clinical, radiographic and histological characteristics of failed dental implants removed between 2023–2025

Multicentric design-> University of Pisa and University of Chieti (Italy)
Ethical approval: "BONEISTO", protocol n° 19505



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Collected data

- Complete medical history
- Clinical and radiographic data of the implant scheduled for removal
- Removal method (Trephine burs were used when residual osteointegration was present)
- Histologic characteristics when implants were removed with surrounding bone

Indications for implant removal

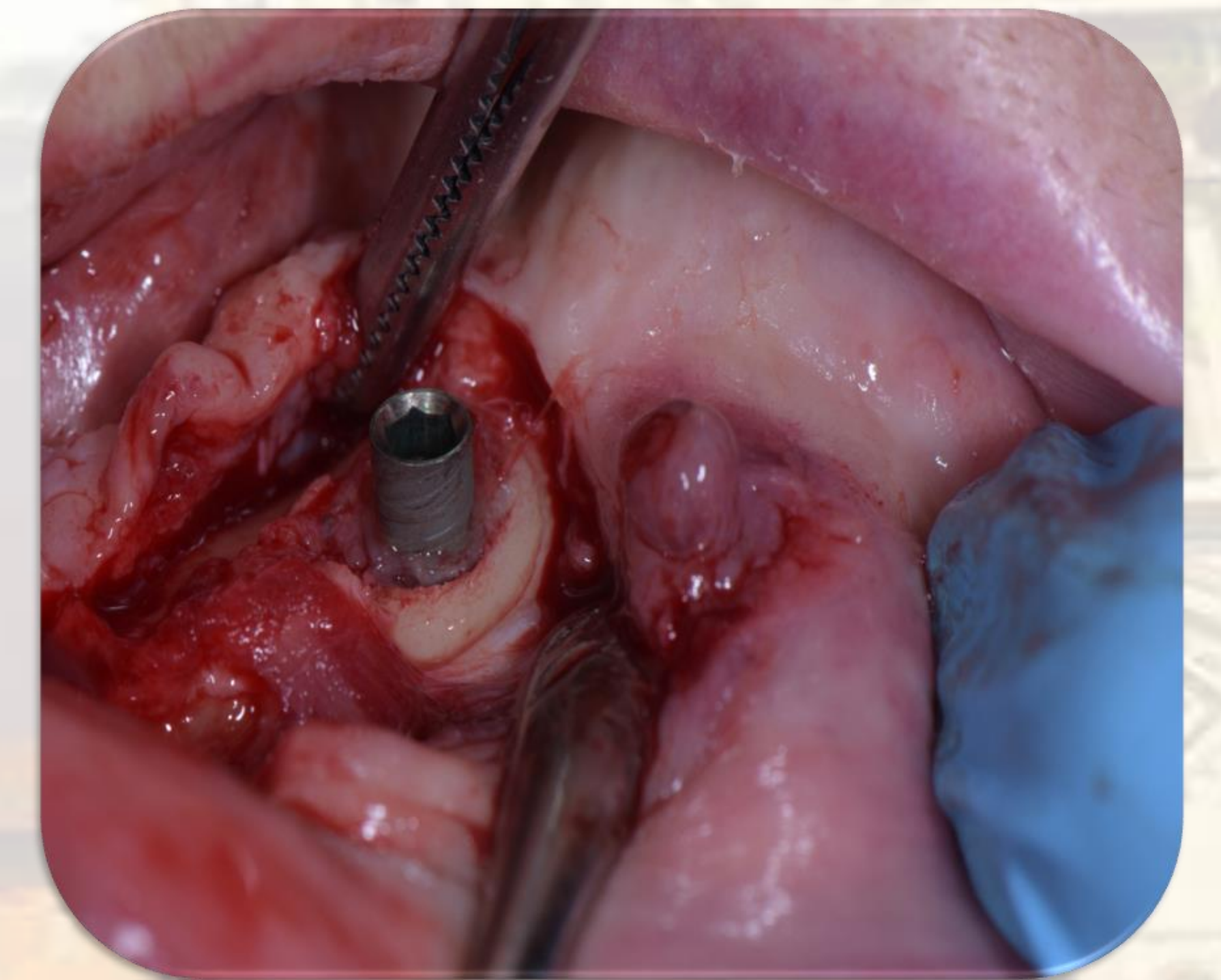
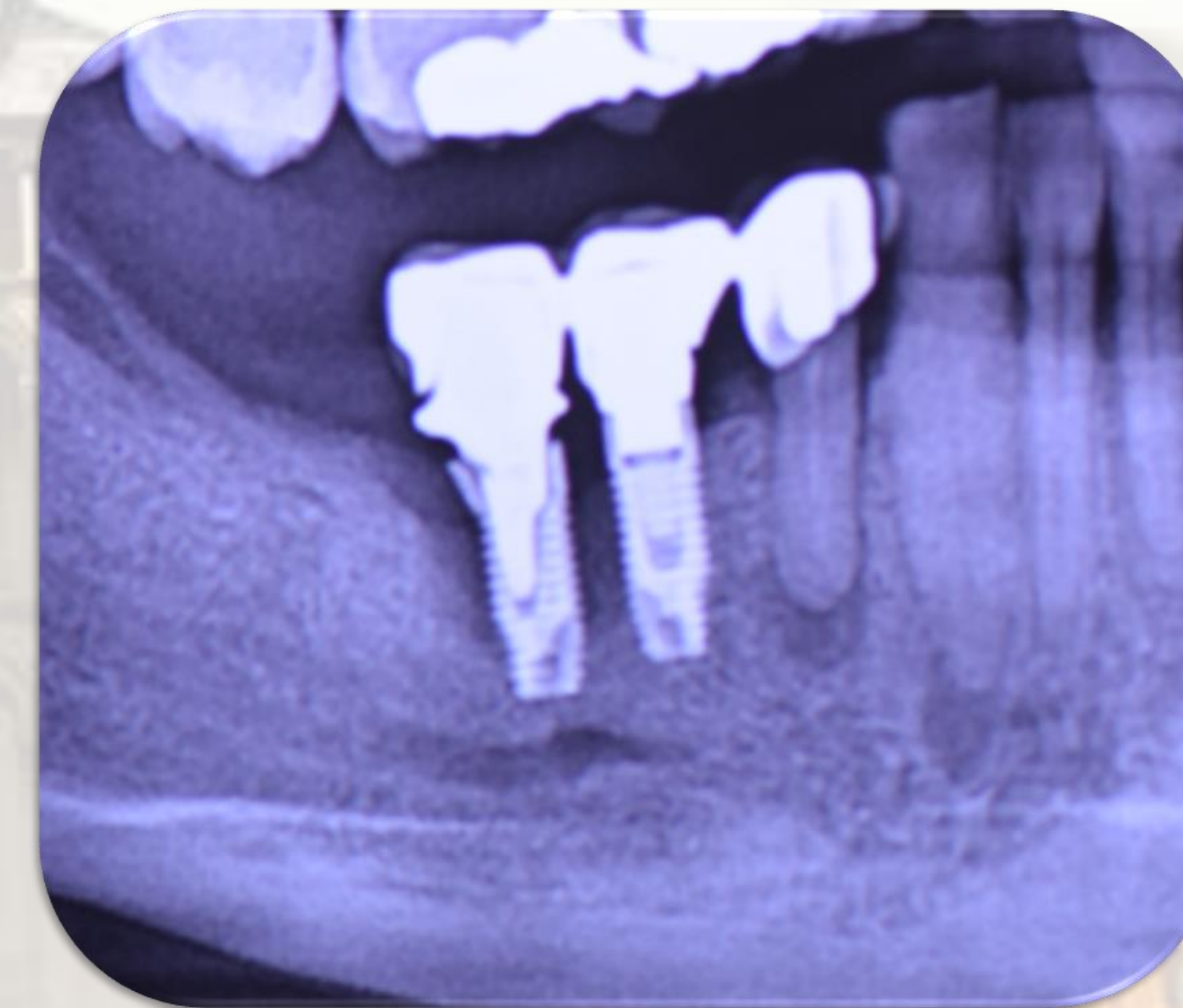
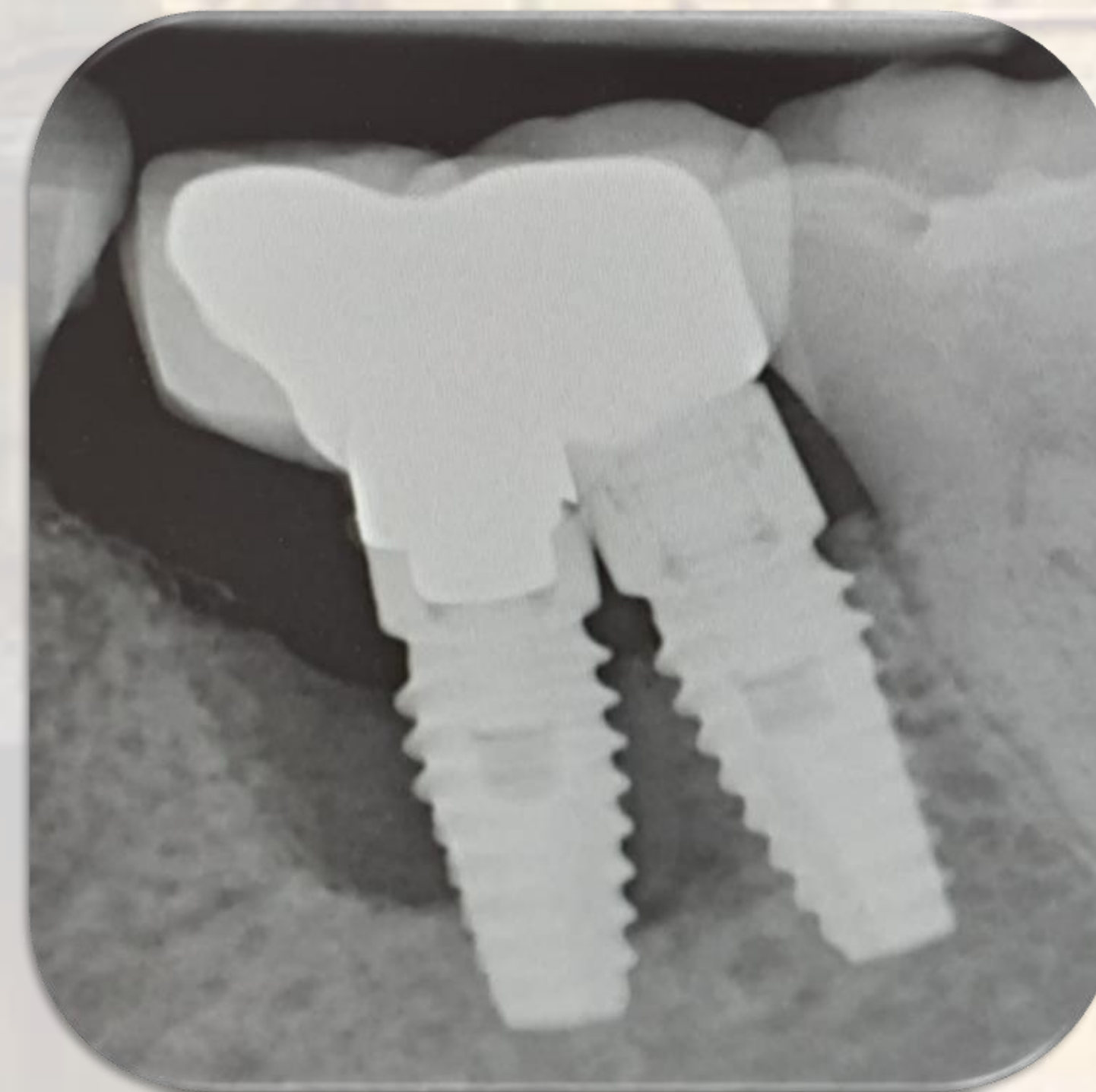
Peri-implantitis
involving more than
50% of the implant
length

Irreversible
prosthetic
complications

Misplacement

Implant fracture

Recurrent acute
infection



Results

Sample = 30 patients with 51 implants

22 females, 8 males

Mean age = 64.9 ± 8.9 years

22 patients (73.3%) with systemic pathologies

13 (59%) assumed medications affecting bone metabolism

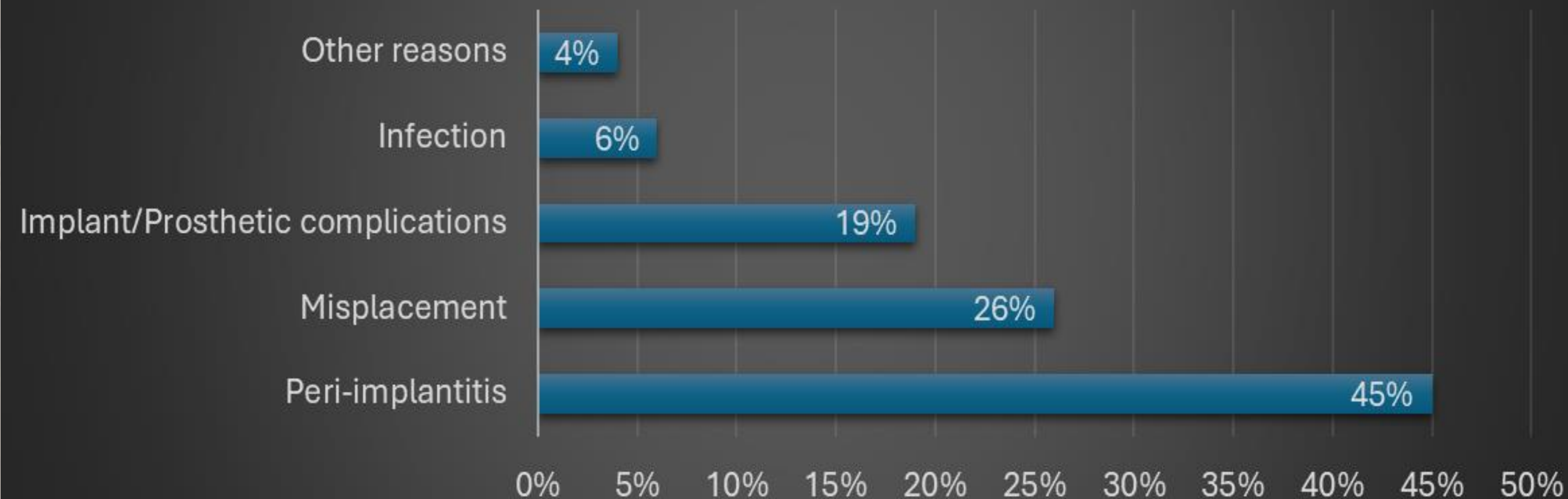


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Medications affecting bone metabolism

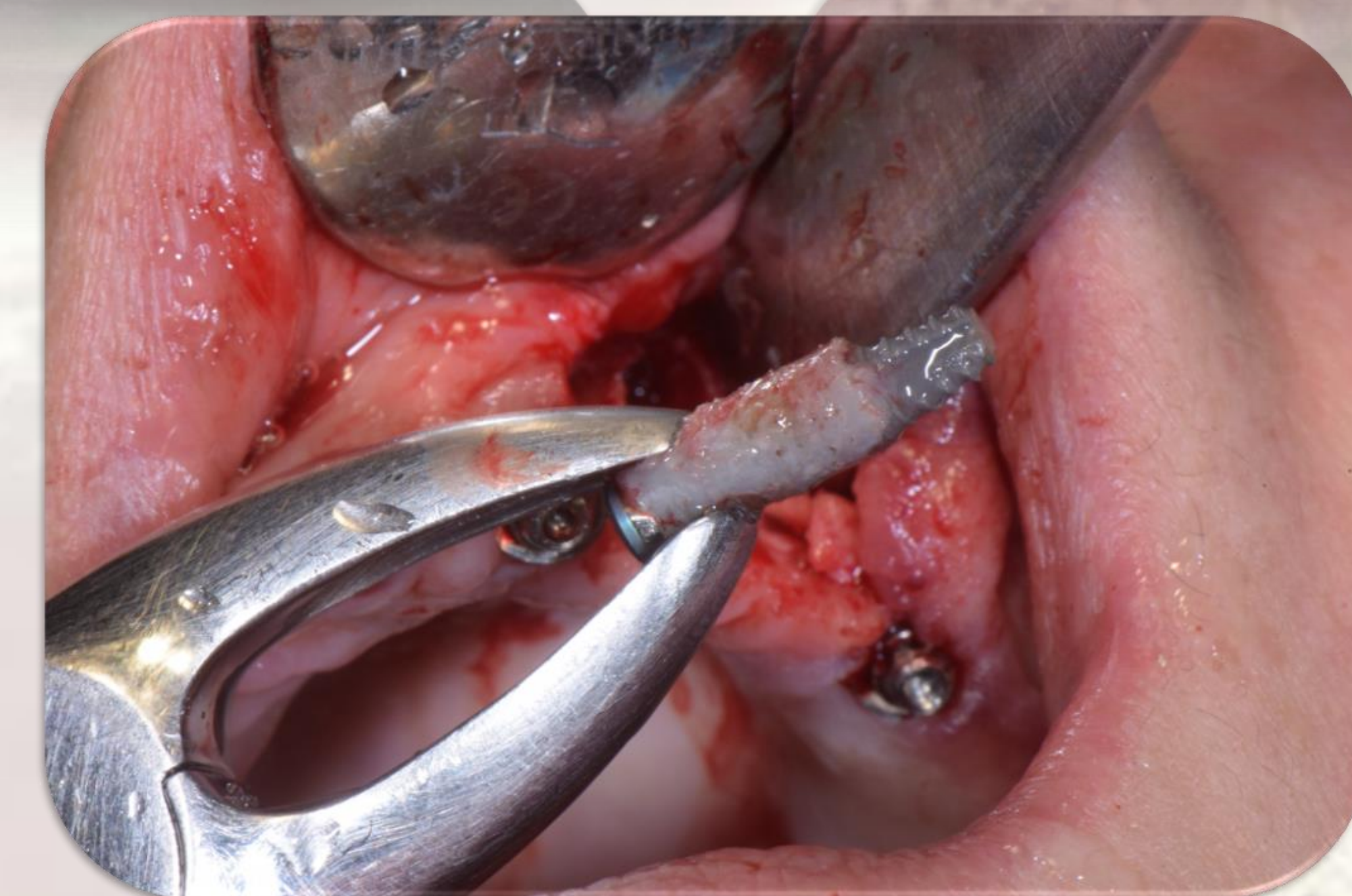
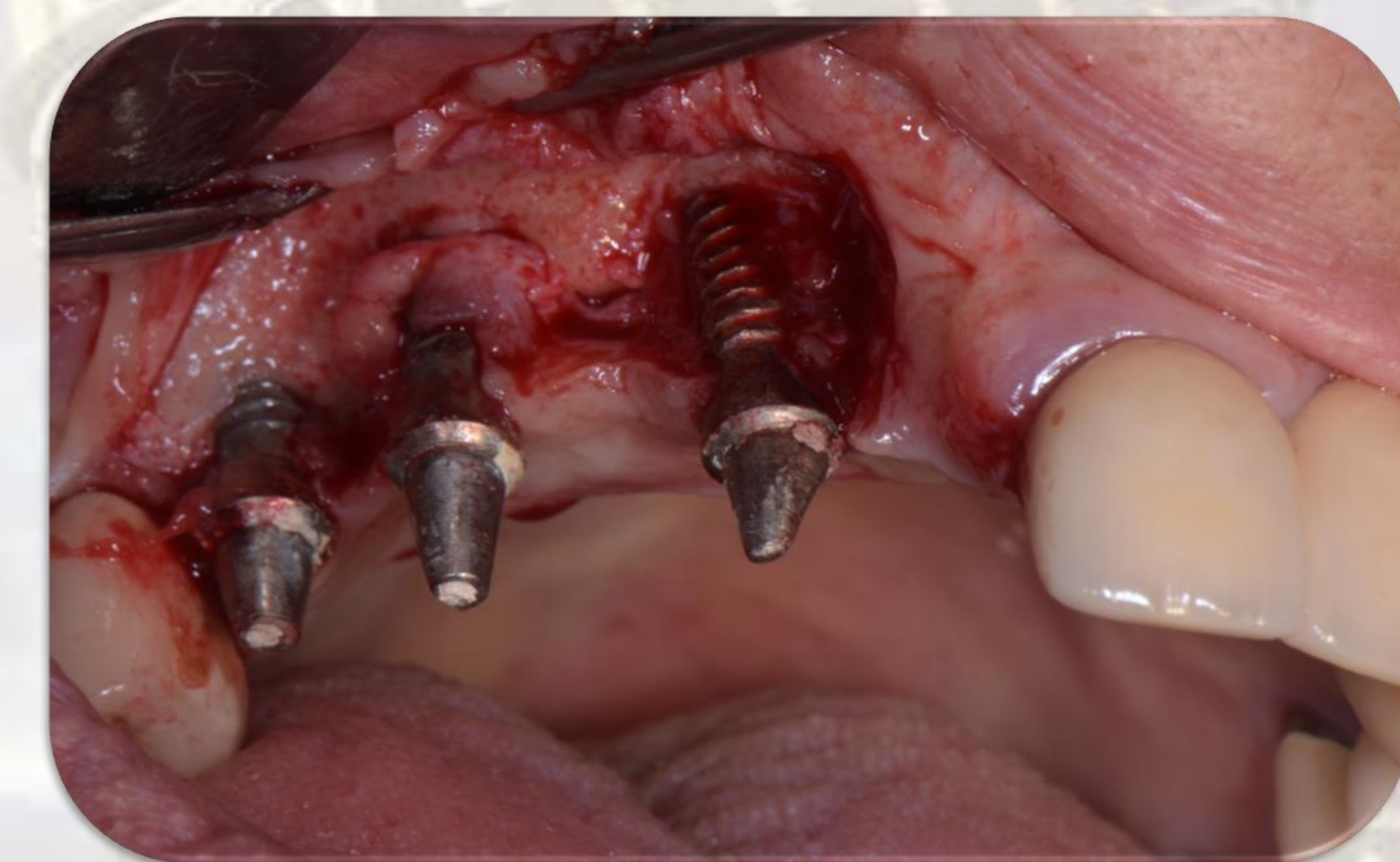
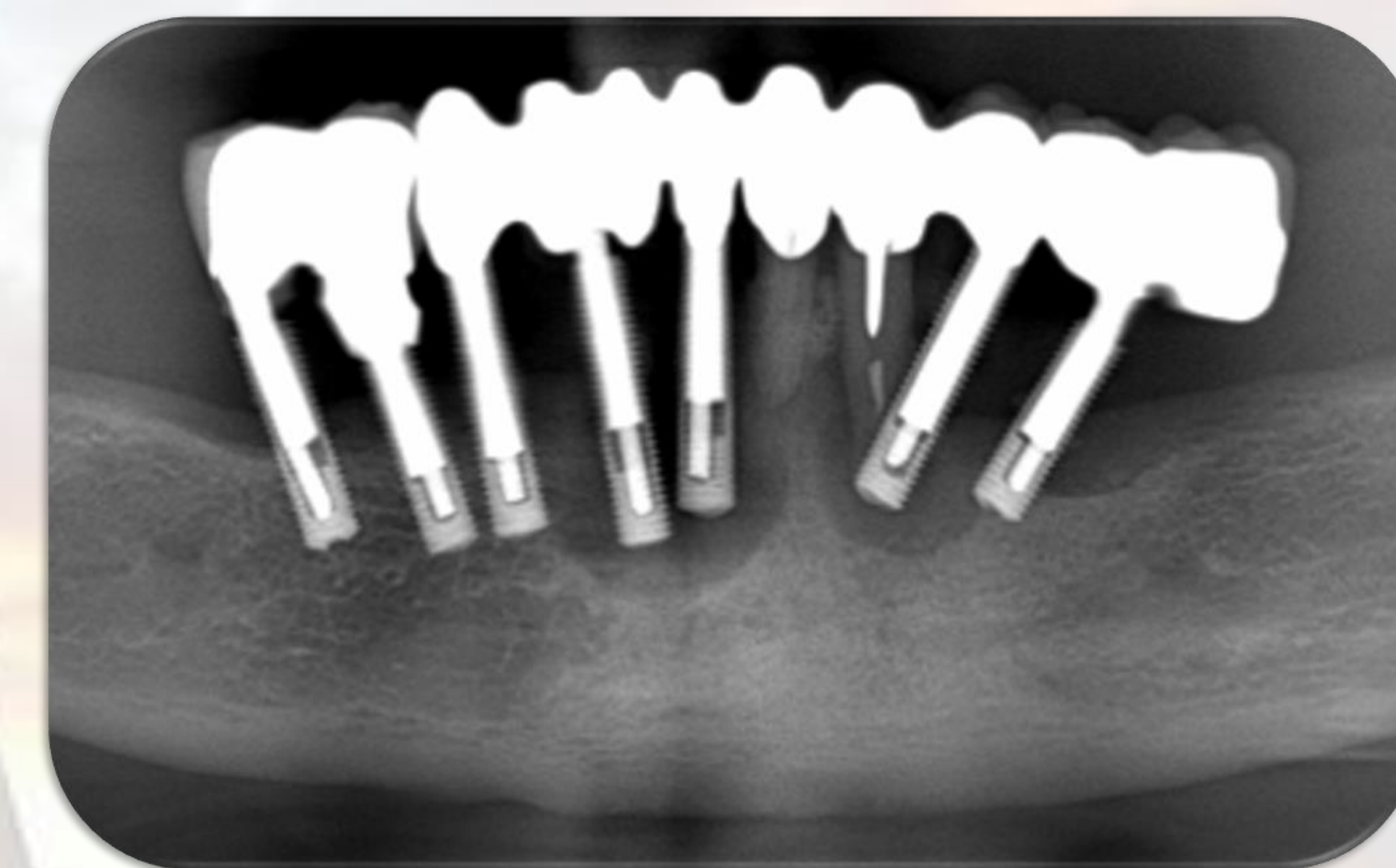
Bisphosphonates
Aromatase inhibitors
Selective serotonin reuptake inhibitors (SSRI)
Serotonin–norepinephrine reuptake inhibitors (SNRI)
Monoclonal antibodies
Proton pump inhibitors
Statins

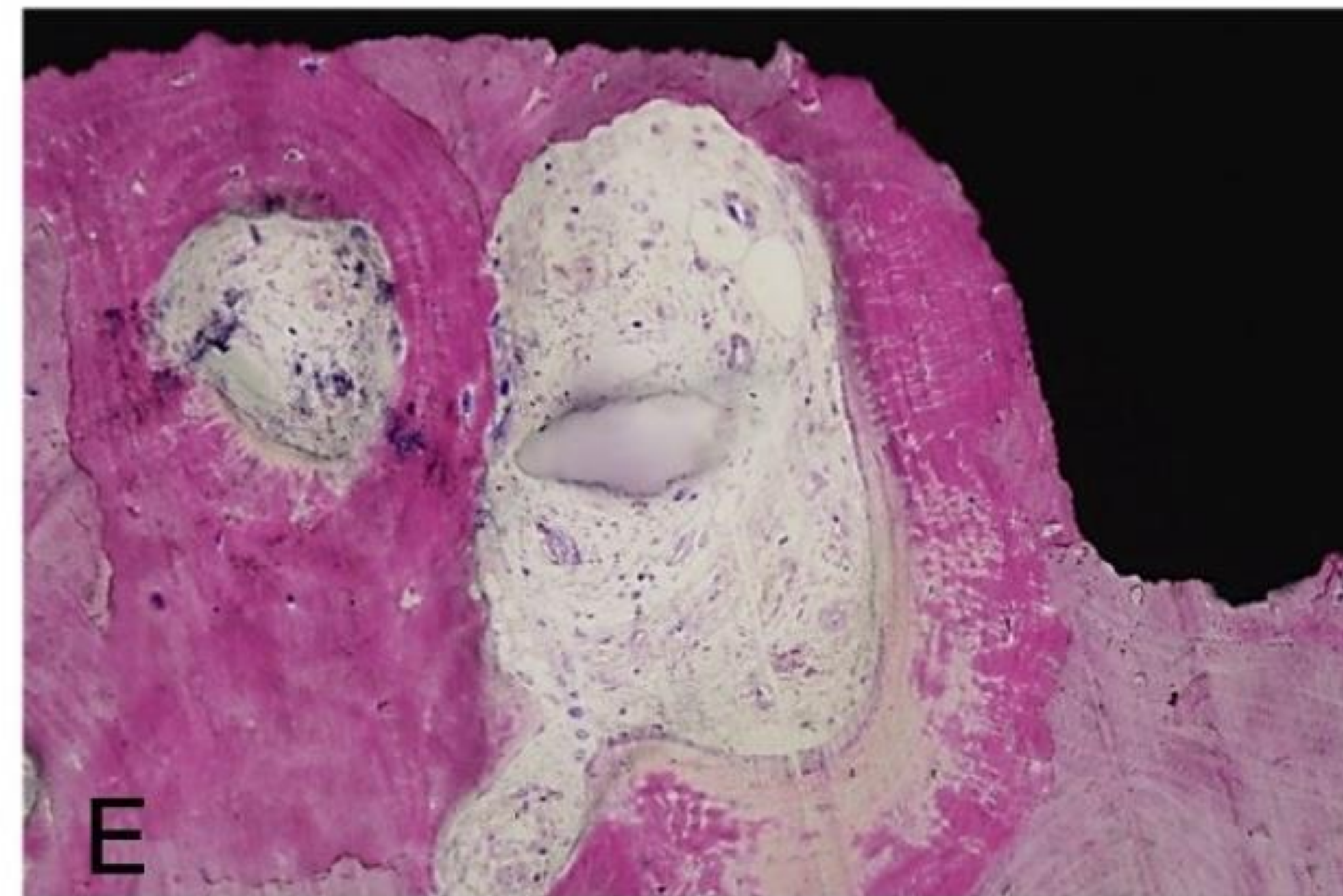
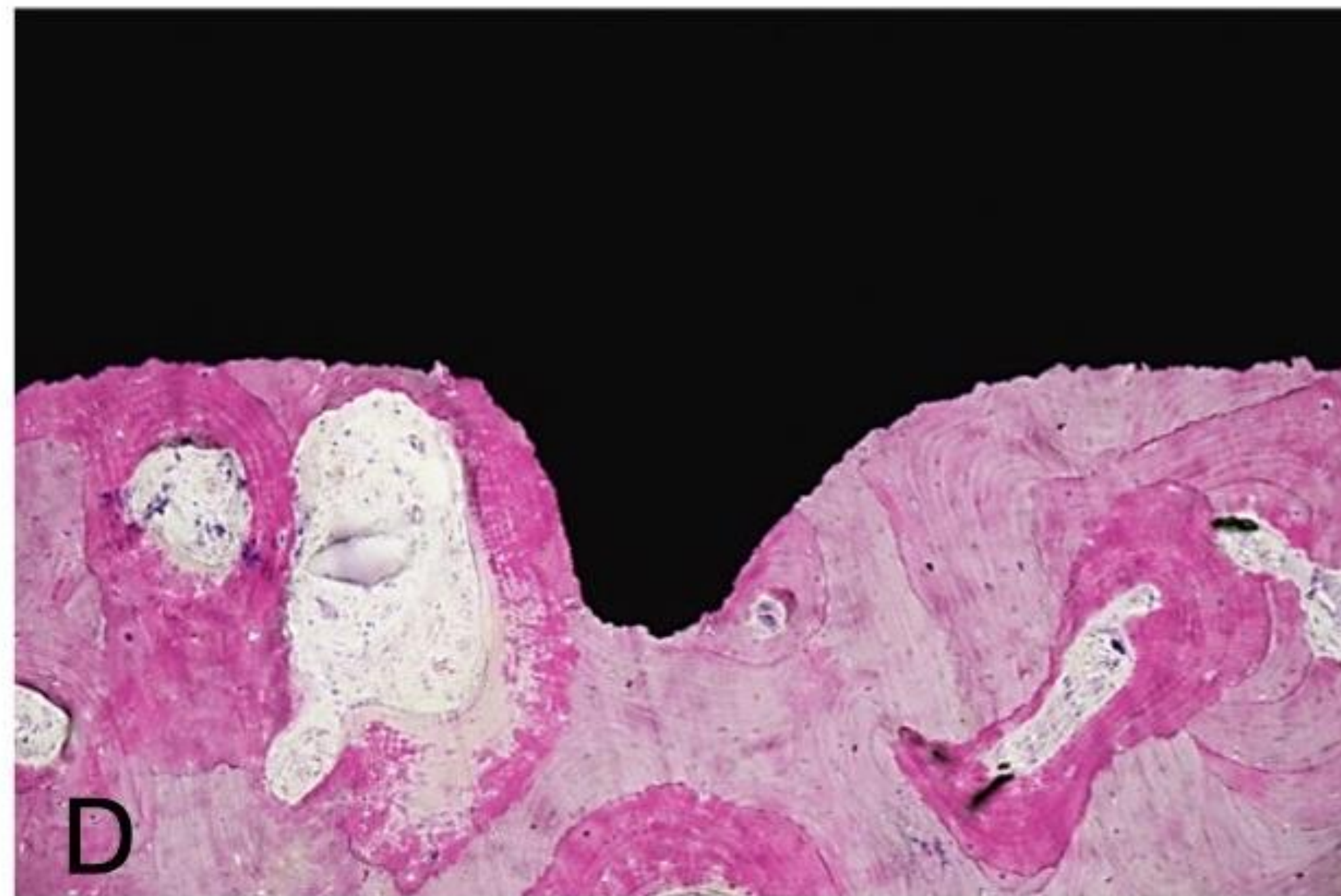
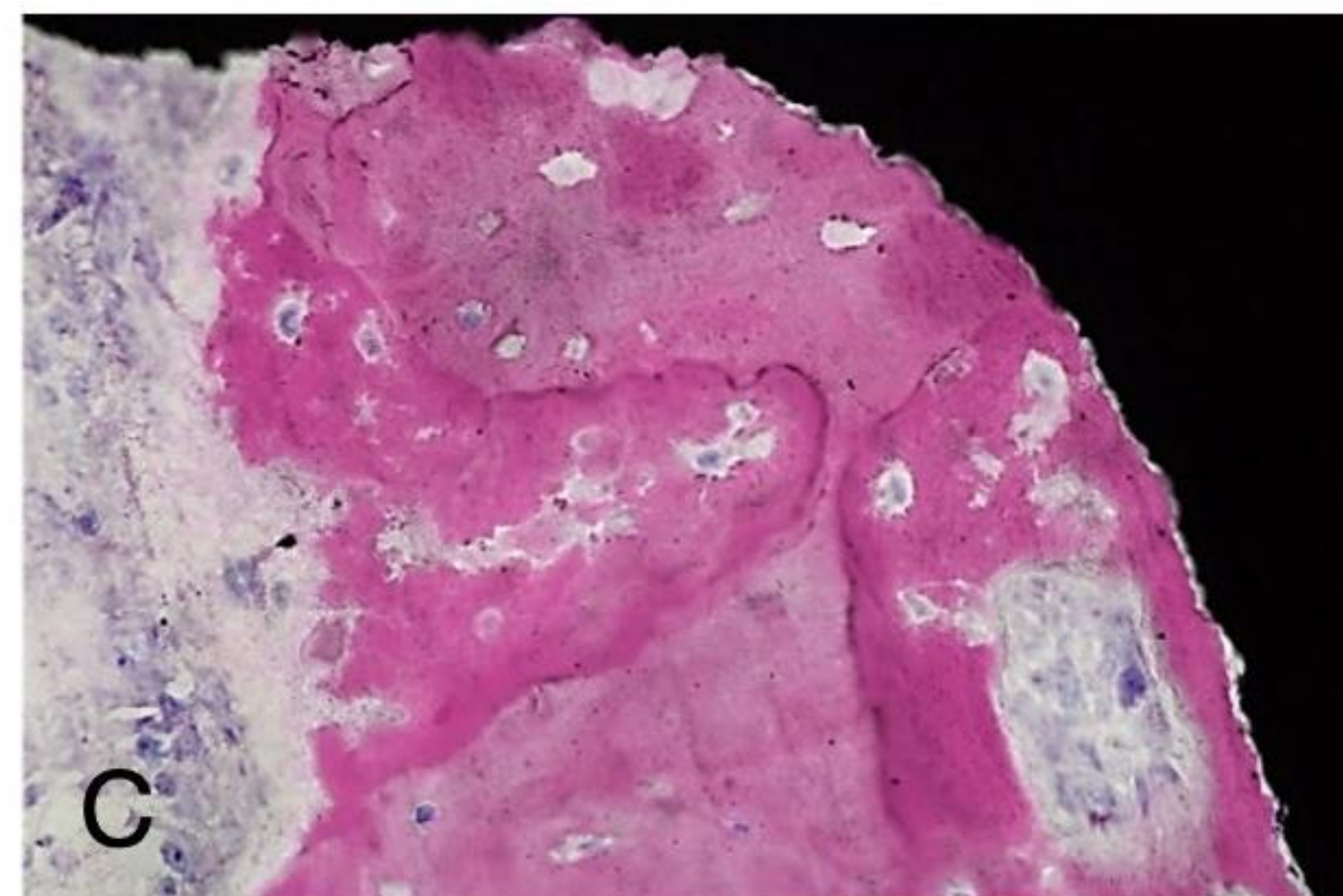
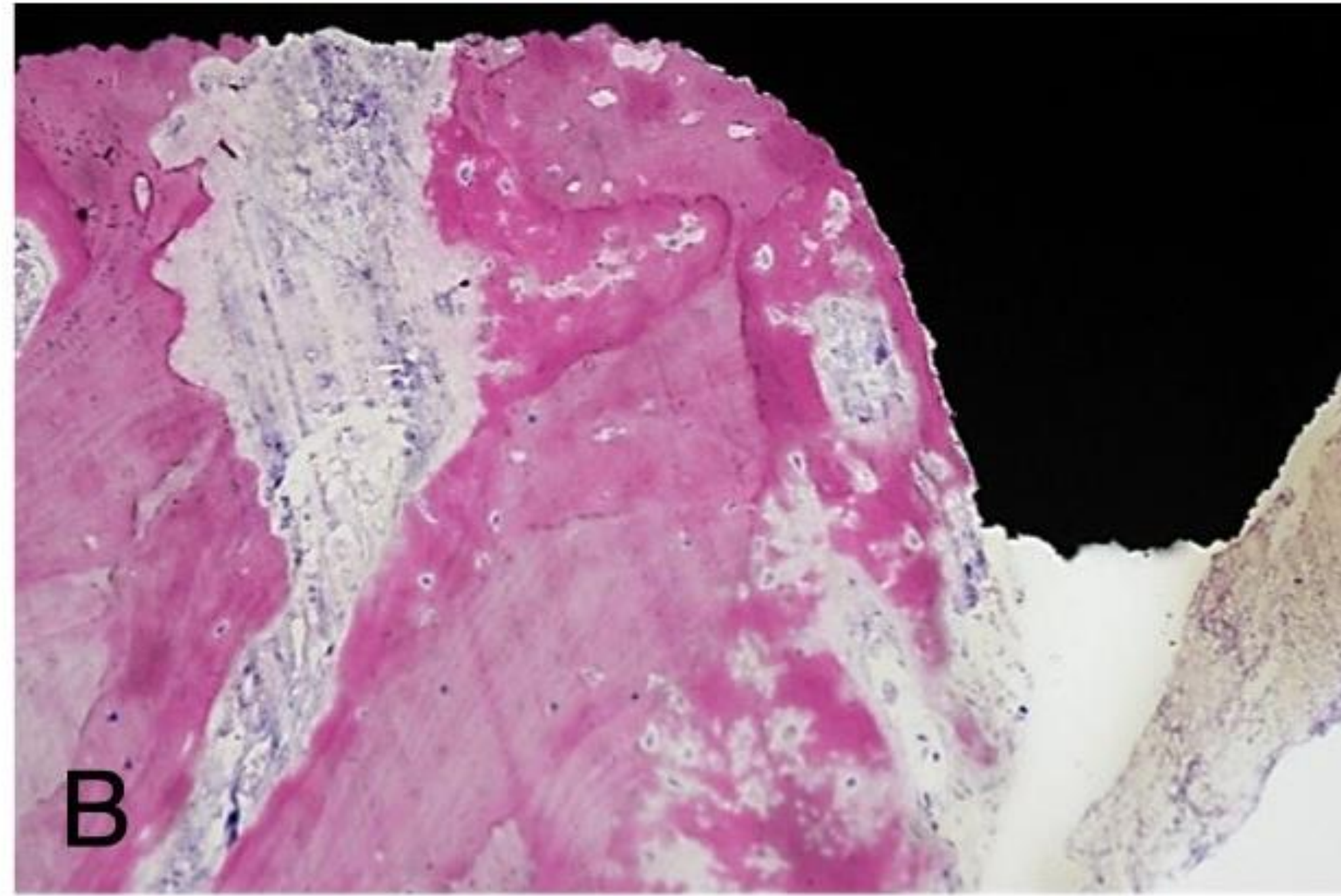
Reasons for implant removal



The mean percentage of radiographic bone loss around the implants was **$50.8 \pm 27.5\%$** .

No statistically significant correlation was found with patients under treatment with medications affecting bone metabolism ($p = 0.66$)





- ✓ Histologic analysis showed that the bone surrounding the removed implants with residual osseointegration was vital and free of inflammatory cells.
- ✓ Implants removed for peri-implantitis showed signs of bone resorption in the crestal portion
- ✓ The peri-implant bone from patients who were under treatment with medications interfering with bone metabolism showed some changes of the remodeling process even though an intact bone-implant contact was present

Conclusions

The histologic analysis revealed that, despite implant failure, the surfaces with a **residual osseointegration showed vital and healthy bone**, suggesting that diseased implants can be successfully treated and used for rehabilitation under favorable conditions.