What Constitutes a Terminal Dentition Given Osseointegration Options?

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- The definitive answer to this question is as follows: the loss of an implant-supported full-arch reconstruction (Fig 1). It is sometimes forgotten that implants can also fail.
- Unfortunately, unlike with the terminated natural dentition, there is no fallback position for the failed implant-supported reconstruction without extensive and morbid reconstructive procedures. Often, patients are not in a position, either financially or through opportunity, to contemplate these resurrection techniques.
- In the event of a terminal implant-related failure, the prosthodontist may be saddled with the responsibility of managing another group of maladaptive full denture wearers. It is, therefore, imperative that considered assessment be provided before a natural dentition, albeit severely debilitated, is terminated.
- Adequate treatment planning prior to termination of a natural dentition involves consideration of the following:
  - Patient-related factors—medical, opportunity, expectations, motivation, disease susceptibility, and maintenance capabilities
  - Site-related factors—soft and hard tissue sufficiency, visibility, occlusal/skeletal relationships, and adequate saliva
  - Failure consequences
  - Operator experience
- It has been claimed that "heroic" procedures to save teeth are not justified in this age of osseointegration.[1] However, caution is required before extensive and unpredictable regeneration procedures are necessitated to replace extracted teeth. "Herodontics" should not be replaced with "Herointegration."
- There has been a change in the demographics of patients who are having their natural dentitions terminated. The success of preventive dentistry has resulted in a larger population of "downhill aggressive," disease-susceptible patients presenting for implant-related therapy. Caries susceptibility does not present a problem with osseointegration, but there is increasing evidence that genetic factors play a role in the loss of bone around both teeth and implants.[2]

Fig 1 A failed implant-supported prosthesis after 9 years in situ. The patient had undergone irregular maintenance and one implant had been removed prior to complete avulsion of the prosthesis.

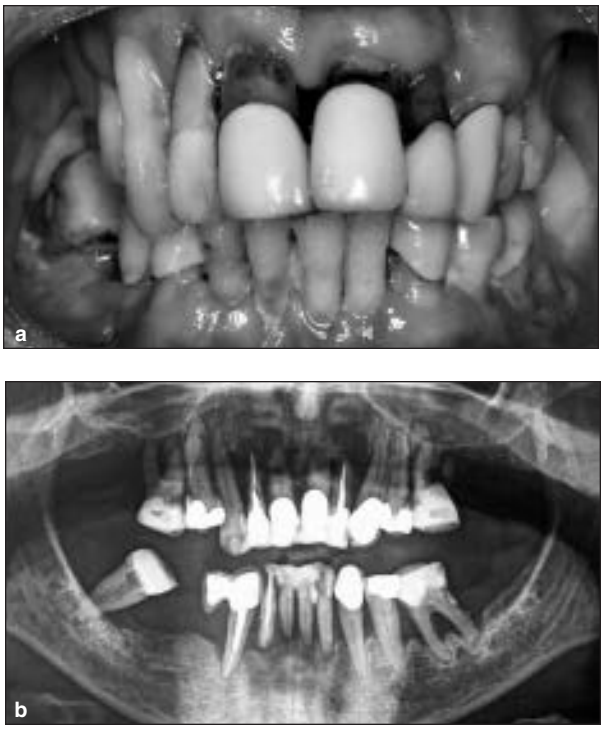
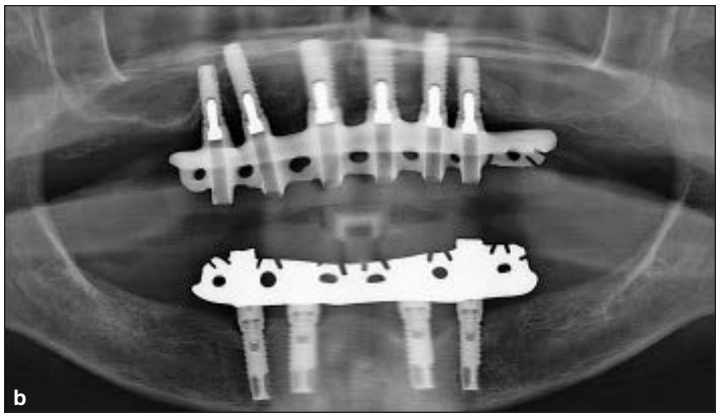


Fig 2 **(a)** A natural dentition determined to be terminal following considered assessment. **(b)** Panoramic radiograph of the same dentition.

- The long-term management of bone loss around teeth in these susceptible patients is more predictable than that around implants (Fig 2).[3,4]
- Patients have a different emotional response to loss of implants than loss of teeth. "My teeth have failed" versus "your implants have failed."
- There have been significant advances in implant dentistry over the last 30 years. Equally, there have also been significant advances in other tooth-related treatments, such as the advent of endodontic microsurgery,

Fig 3 **(a)** Clinical status of the reconstructed terminated dentition shown in Fig 2, after 9 years in situ. **(b)** Panoramic radiograph of the same case.



which gives significantly improved outcomes over traditional root-end surgery.[5]

- The at-times arrogant assumption that implants will "last indefinitely" has increasingly led to minimal "engineering" with regard to numbers of implants placed in a given arch reconstruction and extensive recontouring/removal of residual bone. In the advent of subsequent bone loss and implant failure, this results in minimal "wriggle" room for the managing prosthodontist (Figs 3 and 4).
- Osseointegration has provided great benefits for many fully edentulous patients, but careful consideration must be given before the natural dentition is terminated.

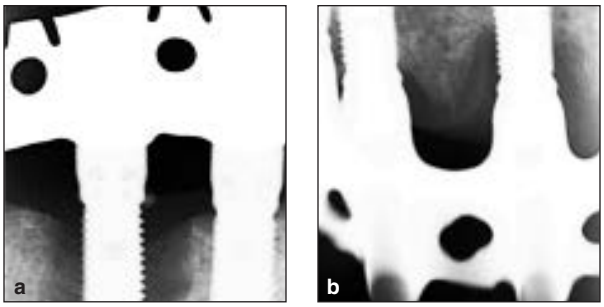


Fig 4 Extensive bone loss around isolated implants in the **(a)** mandible and **(b)** maxilla of the reconstruction shown in Fig 3.

References

1. Minichetti J. American Academy of Implant Dentistry. Chicago: PRN Newswire, 2009.
2. De Boever AL, Quirynen M, Coucke W, Theuniers G, De Boever JA. Clinical and radiographic study of implant treatment outcome in periodontally susceptible and non-susceptible patients: A prospective long-term study. Clin Oral Implants Res 2009;20:1341–1350.
3. Esposito M, Grusovin MG, Worthington HV. Interventions for replacing missing teeth; treatment of peri-implantitis. 2012 Update of Cochrane Database of Systematic Review. 2010;6:CD004970;PMID: 20556759. Comment in Evidence Based Dent 2012:13:50–51.
4. Hirshfeld L, Wassermann B. A long-term survey of tooth loss in 600 treated periodontal patients. J Periodontol 1978:49:225–237.
5. Setzer FC, Shah SB, Kohli MR, Karabucak B, Kim S. Outcome of endodontic surgery: A meta-analysis of the literature—Part 1: Comparison of traditional root-end surgery and endodontic microsurgery. J Endod 2010;36:1757–1765.

Implant Therapy for Patients with Terminal Dentitions

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The failing dentition is a transitional status to edentulousness. Thus, there are arguments for saving a few teeth or tooth roots, although questionable, in order to avoid complete edentulousness and wearing of complete dentures. Otherwise, implants offer a variety of treatment options for patients who become edentulous.

Many studies have focused on the ferrule effect and the integrity of teeth that are used as prosthetic abutments. Technical complications and failures occur if insufficient tooth substance is available. Posts and cores may weaken the root and with the final placement of the coronal restoration various materials come in contact. These interfaces may fail and, in contrast, a one-piece titanium screw appears to be advantageous.

Arguments whether a tooth/root can or should be maintained are based on local, biologic aspects, namely with regard to the severity of periodontal disease and furcation problems, or with regard to the status of the endodontium, in single- or multi-rooted