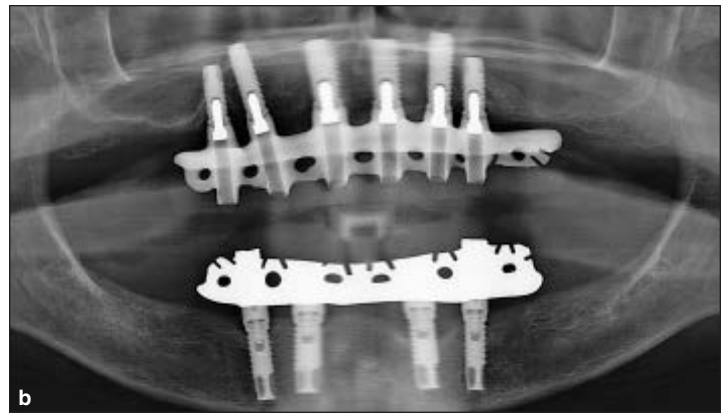


Fig 3 (a) Clinical status of the reconstructed terminated dentition shown in Fig 2, after 9 years in situ. (b) Panoramic radiograph of the same case.



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 “wiggle” 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.

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.

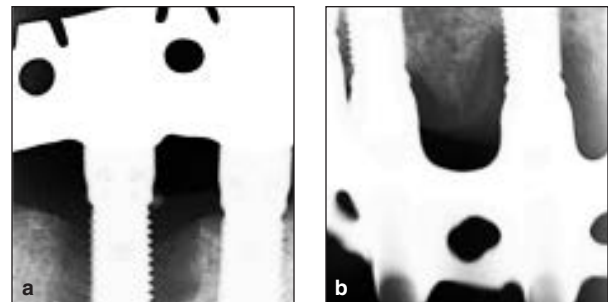


Fig 4 Extensive bone loss around isolated implants in the (a) mandible and (b) maxilla of the reconstruction shown in Fig 3.

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

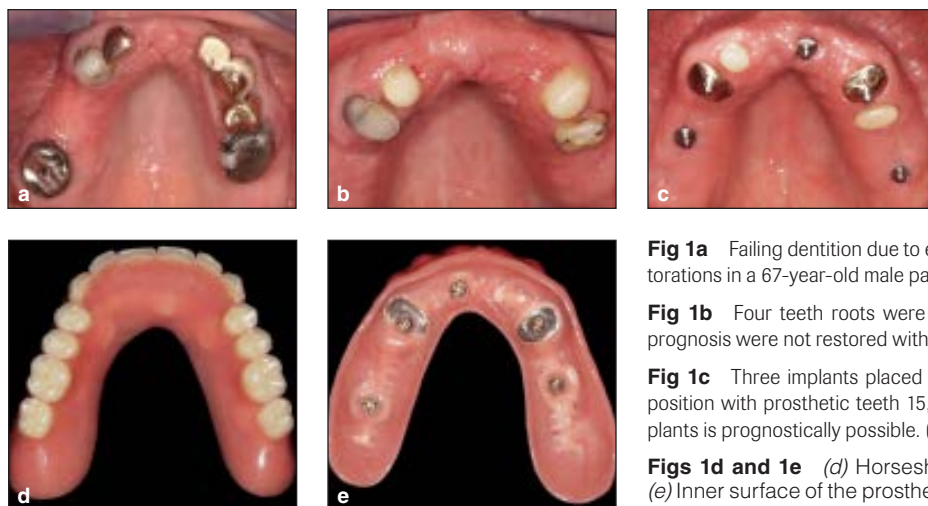


Fig 1a Failing dentition due to extensive caries and compromised restorations in a 67-year-old male patient.

Fig 1b Four teeth roots were retained, but the two with a dubious prognosis were not restored with gold copings.

Fig 1c Three implants placed in strategically optimal and congruent position with prosthetic teeth 15, 21, 26. A treatment upgrade with implants is prognostically possible. (FDI numbering used.)

Figs 1d and 1e (d) Horseshoe design of the final prosthesis. (e) Inner surface of the prosthesis showing the retentive matrices.

Table 1 Evaluation Criteria for Prosthetic Abutment Teeth

Biologic aspects	Strategic value
Periodontics	Position in the arch
Endodontics	Symmetry
Caries	Edentulous space
Structural integrity	Interarch relation
Enamel	Intermaxillary space
Post-cores	Opposing dentition
Ferrule effect	Sagittal class

teeth.¹ In the context of prosthetic rehabilitation, decision making has to take into account the structural integrity of the teeth, their strategic value and position in the arch, and the inter-arch relation and space available for reconstructions (Table 1). Management of the failing dentition means evaluating such prosthetic criteria and balancing the investment of time and costs, if restoring teeth, against the extraction and placement of implants.

For patients with a failing dentition, the benefit of implants is twofold:

- **Strategy 1.** At least one implant is placed in combination with a minimal number of natural teeth or tooth roots, which means an increase of prosthetic abutments to stabilize and support a removable prosthesis. This is indicated particularly in the case of long-span gaps, an asymmetric distribution of the remaining teeth and roots, or a unilateral edentulous arch.
- **Strategy 2.** Extraction of the entire terminal dentition will result in an optimum arrangement of the prosthetic abutments, ie, the implants to be placed, and in a favorable design of the prosthesis. This

more radical procedure also enables the correction of the jawbone exhibiting an irregular resorption pattern and atrophy after tooth loss. Fixed or removable prostheses can be placed.

The failing dentition is more prevalent in an older population. Today, prevention and maintenance of one's own natural teeth is emphasized. Subsequently, many older patients are in need of removable partial dentures supported by a few teeth. For some aspects, aging is considered a contraindication or a possible risk factor for placement of implants, resulting in a higher implant failure rate. Manual dexterity and visual capacity diminish, and mental disorders may develop. All this could hinder proper hygiene procedures, and adequate maintenance of implants becomes a problem. However, if this is a problem with implants then it is equally one if teeth are maintained, due to fast caries development. Thus, professional support in oral hygiene is required in both situations.

The treatment approach of strategy 1 is often labeled a reduced treatment goal with regard to invasiveness or costs but results in a clear benefit for the patient. The literature exhibits a great variety of possible indications, with a varying number of tooth/root/implant abutments and different types of anchorage devices (Fig 1). From a long-term perspective, this solution anticipates a possible expansion and upgrade with implants, if necessary.

The treatment approach of strategy 2 is straightforward. For many older patients, the transition of a failing dentition, to a simple, stable implant-overdenture in the mandible appears to be the best solution (Fig 2). Favorable long-term results give evidence.³ Younger patients among an older population will ask for fixed prostheses (Fig 3), a treatment modality that is well documented over many years.⁴

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