Journal of Esthetic and Restorative Dentistry

WILEY

CLINICAL ARTICLE

Use of the Restorative Value Score (RVS) in the Planning and Implementation of a Comprehensive Multidisciplinary Treatment Plan

Oscar González-Martín[1,2,3] | Mario Veltri[4] | Huan Su[5] | Mariano Sanz[6,7] | Urs C. Belser[8]

[1]Department of Periodontology, Complutense University of Madrid, Madrid, Spain | [2]Department of Restorative Dentistry and Biomaterials Sciences, Harvard School of Dental Medicine, Boston, Massachusetts, USA | [3]Private Practice, Atelier Dental Madrid, Madrid, Spain | [4]Private Practice, The Dental Center Bedford, Bedford, UK | [5]Private Practice, Burien, Washington, USA | [6]Section of Periodontics, Department of Dental Clinical Specialties, Complutense University of Madrid, Madrid, Spain | [7]ETEP (Etiology and Therapy of Periodontal and Peri-Implant Diseases) Research Group, Complutense University of Madrid, Madrid, Spain | [8]Chairman Emeritus, Division of Fixed Prosthodontics & Occlusion, School of Dental Medicine, University of Geneva, Geneva, Switzerland

Correspondence: Oscar González-Martín (oscar@atelierdentalmadrid.com)

Received: 27 August 2025 | **Revised:** 23 December 2025 | **Accepted:** 26 December 2025

Keywords: endodontics | interdisciplinary treatment planning | periodontitis | prognosis | prosthodontics | restorative value score

ABSTRACT

Objective: Comprehensive rehabilitation for multifactorial dental disease requires coordinated planning across restorative/prosthodontic, periodontal, endodontic, and orthodontic disciplines. Existing tooth-level prognostic tools typically focus on single domains and therefore offer limited guidance for interdisciplinary decision-making or for communicating expected effort and cost.

Overview: This paper proposes the Restorative Value Score (RVS), an objective 0–5 tooth-level index that summarizes, in one number, the amount and complexity of care needed to return a tooth to predictable function and esthetics within a comprehensive plan (with 0 indicating no treatment and 5 indicating extraction). The intermediate categories reflect the breadth of disciplinary involvement and the requirement for more advanced interventions. These interventions are linked to greater time, cost and procedural risk. The RVS is intended to complement—rather than replace—patient-level risk assessment, and should be interpreted in light of systemic, behavioral, and socioeconomic determinants, clinician expertise, and adherence to supportive care. This paper outline the construct and scoring logic, offer guidance for implementation, and propose prospective validation to assess discrimination, calibration, and clinical utility relative to existing tooth- and implant-based alternatives.

Conclusion: By making effort and complexity explicit at the tooth level, the RVS seeks to reduce unwarranted variability, improve predictability and cost-effectiveness, and furnish a common language for clinicians, educators, and patients engaged in multidisciplinary dental care.

1 | Introduction

Our overall mission as dentists has always been to promote and maintain the long-term oral health and function of the population. Today, oral health has gained even greater importance due to the well-established links between oral and systemic health [1]. Simultaneously, advances in research and technology across many areas of clinical dentistry have rapidly expanded our capabilities—not only to prevent and treat oral diseases but also to effectively rehabilitate teeth and oral tissues lost because of oral diseases. Exciting new possibilities have emerged, spanning from prevention to diagnostics and therapy.

Due to common oral diseases such as caries and periodontal conditions, as well as the sequelae of trauma and wear, we see many patients requiring dental treatment in the restorative and reconstructive rehabilitation fields. The aim is not only to restore lost anatomy, esthetics and function but also to achieve an adequate and harmonious inter-arch relationship in both maximum intercuspation position (MIP) and tooth-guided mandibular excursions. An essential aspect of these multidisciplinary treatments is establishing a diagnosis, which guides the development of a comprehensive, problem-based, and sequential treatment plan [2, 3].

Ideally, the chosen treatment plan should consider the following key decision criteria: evidence-based, predictable, minimally invasive (tissue preservation), minimal risk for both patient and clinician, best possible time and cost efficiency, and possibility of re-intervention (in case of an unforeseeable later complication).

Treatment planning in dentistry has traditionally been described as an art rather than an exact technical process [4], and it remains a major challenge for the dental profession. In fact, to achieve an optimal and predictable result that justifies the treatment effort, it is necessary not only to master diagnostic skills and operative techniques but also, notably, to be able to evaluate the prognosis and appropriateness of the combined multidisciplinary interventions that might be required.

Prognosis is defined as the prediction of how an existing disease will progress based on empirical data. It depends on the severity of the disease at the start of treatment, the prescribed treatment, the clinician's skills, and the patient's adherence to the treatment plan. A major challenge is combining the prognosis for different interventions needed to manage a multidisciplinary case [5]. For instance, classical prognostic classification systems for teeth affected by periodontitis can have good predictive ability for periodontally caused tooth loss [6]. However, because these systems consider only periodontal factors at both the tooth and patient levels, they are limited in their ability to provide a comprehensive prognosis when the tooth also requires complex restorative and endodontic procedures, such as root canal treatment, surgical crown lengthening, post-and-core restoration, and final crown placement. Emerging therapeutic approaches offer ways to save teeth that would have previously been deemed "hopeless." For example, combining root canal therapy with advanced surgical periodontal treatments can save teeth with severe clinical attachment loss reaching the root apex [7, 8]. Similarly, combining root canal, periodontal, and restorative treatments can rehabilitate severely compromised clinical crowns [9], or fixed dental prostheses (FDP) can be used to restore function and esthetics in patients with reduced yet healthy periodontium following periodontal treatment [10–12]. However, the reliability of implant-supported prostheses, especially in patients not susceptible to periodontitis [13, 14], necessitates careful consideration of complex efforts to restore severely compromised teeth [15]. This is of particular importance in cases where those teeth are intended to form part of a major full or partial-mouth rehabilitation.

Recently, the European Federation of Periodontology published a clinical practice guideline (CPG) for treating patients with stage-IV periodontitis [16]. These patients not only need effective periodontal treatment but also require multidisciplinary approaches to restore their damaged dentition. This document provides evidence-based guidance on how to integrate periodontal treatment with the necessary restorative therapies, some of which, such as orthodontic therapy and final restorative work, should be completed after achieving clearly defined treatment outcomes. Other procedures, such as placing dental implants or splinting teeth with hypermobility, may be performed during later stages of periodontal therapy. However, this guideline does not specify the complexity of these treatments and therefore does not provide an overall assessment of cost-effectiveness.

The purpose of this review is to introduce a newly developed system that assigns a restorative value score (RVS) to each tooth potentially involved in a multidisciplinary treatment plan. This scoring system will support the diagnostic process and give an explicit estimate of the overall complexity and time needed to achieve the functional and esthetic goals within a comprehensive treatment plan.

2 | Limitations of the Current Prognostic Classifications

Previous classification systems were limited to either periodontal stability or tooth restorability [17, 18]. This was probably due to a lack of sufficient evidence to create a comprehensive system, a challenge already evident in attempts at single-discipline prognostic classifications. Authors who carried out earlier classification efforts [19] emphasized their frustrated attempts to develop an effective, evidence-based prognostic system for a specific tooth.

Probably the most significant effort to clarify the prognosis of a specific tooth has been made in periodontology. Different categories have been used to classify the condition of the tooth, the necessary treatment(s), and the role that teeth should play in an overall treatment plan.

It must be recognized that periodontal prognosis involves both local and systemic risk factors. Several systems have been developed over the years to estimate periodontal prognosis based on these factors. A recently conducted study aimed at externally validating these systems on a sample of 148 periodontally susceptible patients treated and maintained in a university periodontology department [6].

All systems were found satisfactory, with the best prognostic value attributed to the Miller and coworkers [20] and Nunn and coworkers systems [21]. This new study demonstrated a greater prognostic value for these systems compared to an earlier validation study by McGuire and Nunn [22]. An explanation provided is that the tooth loss event was correctly predicted when extraction was performed due to worsening periodontal conditions. Previously, however, all causes of extraction were included, which led to poorer performance of the models tested. While these findings are positive overall, they highlight the ongoing challenge of making a definitive prognosis for an individual tooth.

Recently, Nibali and coworkers [23] introduced a specific tooth prognosis system that includes factors such as bone loss,

Probing Pocket Depth (≤ 6 or > 6 mm), Furcation Involvement [24], mobility [25], periapical pathology [26], and restorability [27]. The system categorized teeth into good and fair (grouped for the final analysis), questionable, and unfavorable prognoses. Once again, a strong link was found between the prognosis system and tooth loss during supportive periodontal treatment, indicating its potential usefulness in predicting tooth prognosis, possibly in combination with patient-based risk assessment tools. Although restorability was identified as one of the prognostic factors, it was not fully incorporated into the prognosis system.

Finally, periodontal prognostic factors have been integrated into a recent consensus classification to evaluate the severity of periodontal disease. This classification considers tooth-level factors (furcations, bone, and clinical attachment levels), dentition-level factors (number of occluding units, drifting or bite collapse, severe ridge loss, and previous tooth loss due to periodontitis), and patient-level assessments (smoking and diabetes) [28]. This latest classification has proven to be reliable for patients in the most severe categories, who face higher risks of periodontal tooth loss [29]. Analysis of available periodontal prognostic systems in the literature shows that the classic recommendation to carefully consider only the periodontal treatment needs when determining a definitive prognosis for a tooth in the context of its use in comprehensive restorative treatment may be incomplete, since the lack of the restorative dimension could lead to inadequate restorative treatment planning.

The new proposed clinical practice guideline for the treatment of Periodontitis Stage IV patients recommends considering the extent of the edentulous spaces, as well as the number, distribution, and restorability of teeth that can be retained, irrespective of whether the restorative plan is tooth or implant supported [16].

These different scenarios must also consider the technical complexities of the planned prosthesis, as well as the surgical interventions required to place implants in an adequate prosthetically driven position. Unfortunately most of the scientific literature on restorative prognosis presents low-level evidence, as indicated in a consensus publication reporting on the epidemiological link between tooth loss and prosthetic restorations [5] and there is no complete restorative prognostic system available. Because of this, decisions are often based on the clinical expertise of practitioners and patient preferences rather than scientific evidence [30]. This is especially true when considering tooth longevity with primary endodontic therapy or re-treatment, or in the presence of a post and core, depending on the remaining tooth structure.

The remaining sound structural integrity has also been proposed as a critical factor in the restorability of a given tooth [2, 27, 31]. However, the clinical assessment of the amount of dentin needed or the strategic value of remaining tooth structure for the functional requirements of a restored tooth is currently based solely on clinical opinion [32]. The few existing studies evaluating this issue have provided valuable but limited evidence [5], which warrants further research on the prognosis of restorative treatment depending on the amount of remaining healthy tooth structure.

It is also worth considering the trend toward minimally invasive treatments in modern restorative dentistry, which are based on enamel and dentin adhesion. This approach differs from previous studies that have evaluated tooth prognosis based on full-crowned restorations and the need for a ferrule effect. However, the requirements of healthy remaining tooth structure for bonding protocols are yet to be determined.

When considering the longevity of endodontically treated teeth, there is evidence that root canal treatment results in excellent clinical outcomes, which support tooth preservation despite their pulpal pathology [33, 34]. This evidence favors the preservation of teeth. Moreover, evidence from prospective and retrospective studies on the causes of tooth loss after root canal therapy clearly identifies non-endodontic factors, such as root fractures, as the main causes [30, 35].

Esteves and coworkers proposed a classification for assessing the prognosis of extensively damaged teeth [27]. This classification considers their ferrule effect, the relationship of crown to root length, and the endodontic condition. Despite being a well-considered effort, this guide is mainly based on clinical experience. As previously mentioned, partial adhesive restorations have been suggested for endodontically treated teeth, as they have demonstrated high short-term survival rates, with only 4.32% failing within 2 to 4 years after placement. However, these failure rates increased over time, reaching 10.65% at 12 years and 20.94% at 30 years, resulting in most cases (15.51%) with tooth loss [36].

In modern dentistry, the decision to retain a compromised tooth with root canal therapy and extensive restoration is usually compared to the option of extracting it and replacing it with a dental implant. Although reasonable long-term success rates and greater flexibility in clinical management suggest that root canal treated or retreated teeth is often preferable, they are underused as abutments for fixed dental prostheses and typically replaced by implants [37]. Although efforts have been made to support this decision on scientific evidence, most reports conclude that it is the practitioner, considering many factors such as their expertise, the patient's preferences, cost-efficiency, and practice business model, who makes the choice [38].

In summary, the current scientific evidence does not provide meaningful guidance related to restorative prognosis, this is even more evident in interdisciplinary scenarios. Conversely, most attempts to clarify this area, although important and valuable, conclude that the final decision to maintain by treating or extracting a tooth often depends on one critical issue or may rely on collective risks related to only a few other factors, rather than on the restorative risk [39]. Therefore, treatment planning decision-making remains highly variable, often reflecting the clinician's educational background, specialty training and personal philosophy rather than standardized criteria [40]. This subjectivity underscores the need for a structured, interdisciplinary framework such as the Restorative Value Score (RVS).

3 | The Restorative Value Score (RVS)

Although current restorative techniques may enable the restoration of most teeth requiring treatment, several factors must be

considered for an accurate assessment of a tooth's restorability within comprehensive treatment planning. These include the degree of structural loss, attachment loss, the presence or absence of marginal or apical periodontitis, disease-related sequelae (e.g., black triangles, gingival recessions), and the strategic position of the tooth within the arch. In addition, the complexity of the therapy required to restore a tooth as a predictable abutment must be carefully evaluated.

A scoring system that clearly summarizes the amount and complexity of the required interventions can assist clinicians in determining whether a given treatment is biologically and cost-effective justified. Equally important, such a system facilitates clear communication of treatment scope and risk to both patients and the interdisciplinary team. With this objective, the Restorative Value Score (RVS) was developed to support interdisciplinary treatment planning by objectifying the clinical effort and risk associated with restoring a tooth to optimal function and esthetics.

The RVS assigns a numeric value to each tooth, ranging from 0 to 5, with higher scores indicating a greater need for intervention and, consequently, increased complexity, treatment time, and cost. While the score is calculated on a tooth-by-tooth basis, its clinical relevance lies in the cumulative interpretation of individual scores, allowing clinicians to assess the overall risk profile of the dentition and to identify potential weak links within a comprehensive treatment plan.

The system incorporates the main disciplines involved in achieving optimal function and esthetics—restorative dentistry–prosthodontics, periodontology–oral surgery, endodontics, and orthodontics (Table 1). All disciplines are weighted equally, as an advanced situation is considered to carry increased risk and clinical effort regardless of the specialty involved. The RVS is not intended to replace clinical judgment, but rather to structure and support it, providing a standardized reference that enhances decision-making, interdisciplinary communication, and patient awareness. The detailed scores are calculated as follows:

0. No treatment is necessary: the tooth is disease-free, has structural integrity, and intact attachment levels. It is esthetically acceptable, and its position in the arch aligns with the overall treatment goal.

1. Minimal treatment is needed, with only one discipline required to treat the tooth as part of a comprehensive treatment plan (Figure 1a–k).

2. Moderate amount of treatment is needed and two disciplines involved (Figure 2a–g).

3. Extensive treatment is needed and three disciplines are involved (Figure 3a–l).

4. Advanced and complex treatment is needed. This category will be assigned to those teeth in need of one or more *advanced interventions* eventually in combination with additional minor ones.

Advanced interventions are defined as follows (Figure 4a–g):

- In restorative dentistry–prosthodontics, when the lost coronal tooth structure requires the restoration of more than 70% of the crown, and there is limited ferrule and an unfavorable crown–root ratio [42]. Caries risk management: cases classified as uncontrolled high risk or extreme risk according to the CAMBRA (Caries Management by Risk Assessment) protocol, where disease progression cannot be stabilized by conventional preventive measures and therefore requires intensive, multifactorial interventions [43, 44].
- In surgery–periodontology, when the clinical attachment loss is ≥5 mm, or when bone loss reaches the middle third of the root or beyond, when furcation involvement is ≥grade II, in the presence of more than four teeth lost due to periodontitis, or fewer than 10 occluding pairs, bite collapse, tooth drifting or flaring, tooth mobility ≥grade 2, or a severe ridge defect [28, 45]. This category also includes pathologic lesions affecting teeth that require advanced interventions.
- In endodontics, when extensive pre-treatment is required to allow isolation, or in the presence of the following root canal complexities: pulp chamber morphology difficult to recognize due to a restoration not reflecting the original crown anatomy; fusion or dens in dente; altered canal morphology such as C-shaped canals, curvatures >30°, root canal division in the apical third, or an open apex >1.5 mm. Advanced intervention is also indicated in the presence of chambers or canals not radiographically visible, or when the mandibular canal is too close (<3 mm). Specific circumstances that increase the complexity of root canal therapy include previous access-related complications such as perforations, ledges, or separated instruments, previously completed orthograde or retrograde root fillings, unfavorable positioning of second or third molars with inclination or rotation >30°, a history of trauma or cracked teeth, the presence of root resorption, and teeth with severe periodontitis or previous root amputations [46].
- In orthodontics, the complexity of treatment mainly relates to the type and severity of malocclusion, such as excessive overjet, overbite, reversed overjet, anterior crossbite, lateral crossbite, crowding, spacing, anterior or posterior open bite, and the presence of agenesis or tooth impaction [47]. However, orthodontic complexity also depends on patient compliance and the patient–practitioner interaction, which makes it difficult to define the degree of difficulty objectively [47].

5. The tooth must be extracted, either because it is "irrational to treat," or because its maintenance in the arch would compromise the overall restorative treatment plan in terms of health, comfort, function, and more important long-term stability. This category includes strategic extractions, super-erupted teeth that would not permit the establishment of a correct plane of occlusion whatever the treatment, as well as isolated remnant teeth in an otherwise edentulous arch when a full implant-borne rehabilitation has been planned for (Figure 5a–j).

TABLE 1 | Restorative value score (RVS) categories and classification criteria.

RVS	Amount of treatment needed	Type of treatment
0	None	No treatment is needed: tooth presents complete structural integrity, is esthetically acceptable, and infection-free. Its position in the arch is adequate for executing the comprehensive treatment goal.
1	Minimal	Only one of the disciplines is necessary to keep the tooth in good condition as part of a global treatment plan.
2	Moderate	Two of the disciplines are necessary.
3	Extensive	Three of the disciplines are necessary.
4	Advanced	This category will be assigned to those teeth needing one or more *advanced interventions*, eventually in combination with other minor ones. An advanced treatment would be one needed to solve the following conditions: • Restorative-Prosthodontic: to restore more than 70% of lost coronal tooth structure is considered advanced restorative/reconstructive treatment. Uncontrolled high and extreme caries risk (CAMBRA) • Surgical-Periodontal: clinical attachment loss is ≥ 5 mm or bone loss reaches the middle third of the root or beyond, furcation involvement > II, more than four teeth lost due to periodontitis, presence of: less than 10 occluding pairs, bite collapse, drifting, flaring, tooth mobility ≥ 2 or a severe ridge defect. • Endodontic: complex diagnosis. Need for extensive pre-treatment. Unfavorable position, inclination and rotations > 30°. Presence of restoration not reflecting original anatomy, fusion or dens-in-dente. Altered canal morphology due to C-shape, curvature > 30°, canal division in the apical third, open apex > 1.5 mm and other anomalies. Chambers or canals not radiographically visible. < 3 mm proximity to mandibular canal. Extensive resorption. History of trauma. Concomitant severe periodontitis, cracked teeth root amputations. Previous access with complications such as perforations ledges, separated instruments, previously completed orthograde or retrograde root fillings. • Orthodontic: Major tooth misalignment and/or inter-arch discrepancies requiring extensive orthodontic treatment. Advanced interventions also include those considered in the literature as either strongly operator-dependent, lacking solid scientific documentation or of uncertain prognosis.
5	Tooth is either unrestorable or "irrational" to treat	Extraction

Note: This table outlines the Restorative Value Score (RVS), a 0–5 tooth-level index designed to summarize, in a single value, the amount and interdisciplinary complexity of care required to restore a tooth to predictable function and esthetics within a comprehensive rehabilitation plan. Scores increase according to the breadth of specialty involvement and the need for progressively more advanced interventions, which are associated with greater time, cost, and procedural risk. RVS 4 represents *advanced interdisciplinary care*, characterized by complex treatments across single or multiple disciplines short of extraction, whereas RVS 5 indicates tooth extraction. The RVS is a descriptive, non-prognostic construct intended to complement patient-level risk assessment and to facilitate interdisciplinary communication, treatment planning discussions, and comparison of restorative effort across cases.

4 | Discussion

In modern dentistry, very few teeth are considered untreatable or unrestorable, so the need for tooth extraction should be minimal. However, when planning interdisciplinary treatments, the cost-effectiveness of the therapy must be considered, and this could be the main factor in the decision to extract a tooth. Moreover, because many of these complex cases require teamwork involving periodontic, endodontic, orthodontic, and restorative specialties, it is challenging to assess the relative complexity related to each discipline systematically.

Recent scientific literature shows various efforts to develop a prognostic system for comprehensive treatment planning [19, 42]. The system proposed by Avila-Ortiz and coworkers establishes a scoring system to help clinicians make the best decision regarding whether to extract or save a tooth [19]. Similarly, Samet and Jotkowitz proposed a prognostic classification system based on five categories, assigning a value to each tooth that considers first the most severe pathological condition [42]. The final score is then adjusted by anatomical risk factors, iatrogenic damage, as well as biological, behavioral, and systemic patient risk factors. Although this system aims to comprehensively assess treatment complexity, it is primarily based on clinical expertise rather than scientific evidence.

This lack of a comprehensive and scientifically validated prognostic system in dentistry leads to various issues. In academic settings, students and faculty struggle to evaluate tooth treatment needs thoroughly [48]. In research, the combination of risk factors and determinants across different fields complicates their application to patients with multiple treatment requirements.

FIGURE 1 | RVS 1: Minimal amount of work is needed to restore form and function. Only one of the disciplines is necessary to keep the tooth in good condition as part of a global treatment plan. Clinical signs from an erosive condition are present in this young patient. After correcting the erosive pattern, a mock up is performed (1c). Following patient approval, defective composite restorations were removed and full upper feldspathic veneers were prepared and placed. Lower composite restorations were also performed to re-establish adequate esthetics and occlusal vertical dimension following a three-step technique protocol [41].

FIGURE 2 | RVS 2: Moderate amount of treatment is needed to restore form and function of the two central incisors. Two of the disciplines are necessary to keep the teeth in good condition as part of a global treatment plan: Orthodontics and prosthodontics. Two defective single crowns are present on the central maxillary incisors which are in a slightly buccal arch position. After orthodontic alignment, crown removal, tooth preparation following a vertical preparation protocol, two new Zi based crowns were inserted. The patient is satisfied with the new appearance. Healthy and stable tissue conditions have been predictably achieved with this moderate intervention following restorative principles. The treated teeth had undergone root canal treatment many years earlier. If they had needed retreatment, we would be talking about an RVS 3.

Clinically, professionals intuitively face the challenge of determining a prognosis for teeth needing restorative treatments. When planning treatment—whether for a single tooth, a partial rehabilitation, or a full-mouth reconstruction—clinicians subconsciously assess the short-, medium-, and long-term maintainability of each tooth, its potential role as an abutment, and whether the biological and technical effort required to preserve it is justified by its expected predictability. This clinical

FIGURE 3 | RVS 3: Extensive amount of treatment is needed to restore form and function of the right maxillary lateral incisor. Three of the disciplines are necessary to keep the tooth in good condition as part of a global treatment plan: Endodontics, periodontics, and prosthodontics. A defective single crown is present on the right lateral incisor of a young woman. After root canal re-treatment and crown removal, a provisional restoration was placed. Tooth preparation was carried out following a vertical preparation protocol, and a connective tissue graft in a tunnel approach was performed for thickening the facial tissue and, by this token, to avoid a shining through of the root discoloration. A new Zi-based crown was inserted after a phase of tissue conditioning. For this single-tooth improvement, a considerable amount of treatment was needed to satisfy the patient's request.

reasoning process is universal, yet it is rarely formalized or quantified. For instance, a tooth that appears healthy periodontally might still be unrestorable and end up being extracted despite having a "good" prognosis. Similarly, in some cases, the therapy's cost-effectiveness makes it hard to justify the effort involved. Overall, it seems necessary to create a tool to

FIGURE 4 | RVS 4: Advanced amount of treatment is needed to restore form and function of the maxillary right central incisor. This category is assigned to those teeth needing one or more *advanced interventions*, eventually in combination with other minor ones. An advanced treatment would be one needed to solve the following condition: Endodontic preoperative perforation. To seal the mid-buccal perforation, an open flap access followed by a minor osteotomy was performed with a complex isolation process. Before and following the sealing, minor orthodontic movements and a composite restoration were carried out on this maxillary right central incisor.

evaluate the overall complexity of interdisciplinary treatments. The Restorative Value Score aims to translate this implicit clinical judgment into a structured numerical and simple score, allowing individual tooth-related risks to be identified, communicated, and integrated into a broader treatment strategy.

Therefore, we suggest developing the RVS to help any specialist easily understand the total care required for any tooth based on the established treatment plan. Although the RVS is calculated on a tooth-by-tooth basis, its clinical value lies in its cumulative interpretation. This approach is particularly relevant in

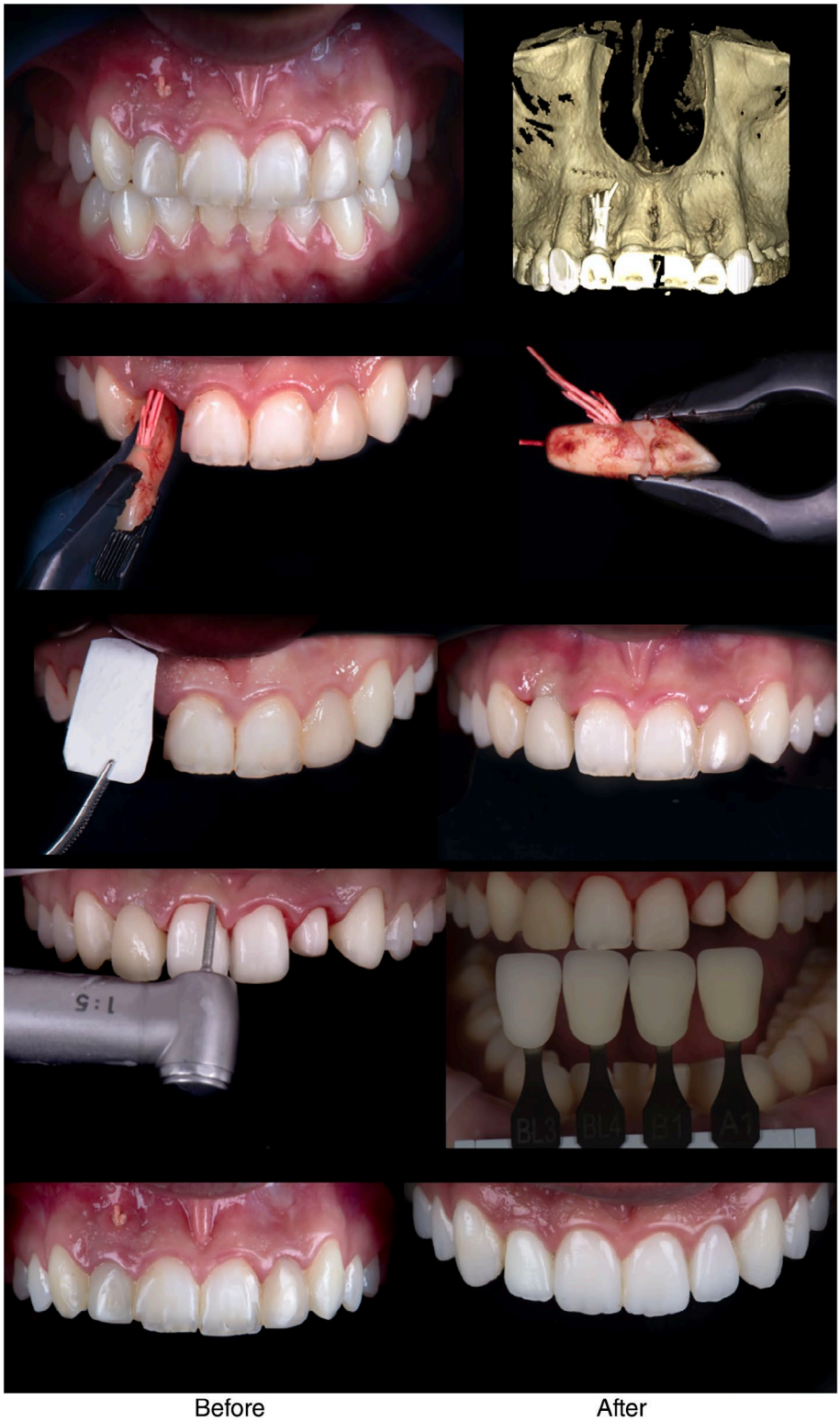

FIGURE 5 | RVS 5: Tooth is unrestorable and therefore the extraction is planned. This patient presented in the office with a large root perforation of a maxillary right lateral incisor. It should be noted that the inflammatory process created both a bony and a mucosal perforation, so that part of the gutta-percha became visible. Given the clinical conditions, the tooth was extracted, and an extensive amount of treatment was needed to rebuild the bone and soft tissue architecture, the placement of an implant, the sculpting of the soft tissue following the principles of the critical and subcritical contour, followed by a new full-crown restoration.

interdisciplinary dentistry, where teeth often undergo multiple procedures that may be highly predictable in isolation, yet when combined, may result in a summative increase in risk. By making this cumulative risk explicit, the RVS supports more transparent decision-making, facilitates patient communication, and promotes shared responsibility between clinician and patient regarding treatment complexity and prognosis. When individual RVS scores are considered collectively, they help clinicians evaluate

the overall risk profile of the dentition, anticipate potential weak links within a treatment plan, and understand how multiple moderate-risk teeth may, together, significantly increase the probability of complications or failure. In this way, the prognostic value of the RVS is also not based on scientific evidence but rather on common sense and clinical experience.

The key to the RVS is differentiating between advanced and standard treatments. In fact, scores from 1 to 3, which are based on adding standard planned therapies, easily support estimating treatment costs and duration. Conversely, a score of 4 is based on the need of advanced treatments in any discipline involved. These advanced interventions in the RVS system are characterized by the presence of critical tooth conditions whose therapy is not evidence-based, has an uncertain prognosis, or is heavily dependent on high operator skills. Therefore, one critical aspect of this proposed RVS system is the definition of advanced treatments across different disciplines (score 4).

In the Restorative-Prosthodontic field, the need for restoration of more than 70% of lost coronal tooth structure has been identified as the main RVS score 4, based on the associated limited ferrule and unfavorable crown-root ratio [42].

In the surgical-periodontal field, various clinical scenarios are linked to a poor prognosis, such as attachment loss exceeding 50% [49–51], presence of class II [17, 18, 22, 51] and class III furcation involvement [52, 53], and increased mobility that cannot be controlled through splinting [22, 50, 51, 54]. Also associated with an unfavorable prognosis are local factors that complicate access for therapy and hygiene [55], such as tooth crowding, root proximity, and other unfavorable anatomical factors.

The presence of these factors, however, should not be a reason for extraction, however patient must be informed of the complexity of the treatment and the uncertain of the result. Today, there is clear evidence that teeth with severe attachment loss, even beyond the apex, can be treated and maintained in function for a decade [8]. Molars with degree III furcations can be successfully retained in patients undergoing strict supportive periodontal therapy [56], and degree II mobile teeth can be effectively used as support for cross-arch fixed dental prostheses [10, 11]. Due to this and considering the current periodontitis classification, an advanced periodontal condition has been assigned to teeth within a stage IV periodontitis case, as they require more complex treatments, and this condition is related to an increased risk of tooth loss during SPT [29].

In endodontics, factors linked to increased treatment complexity are based on evidence-based root canal treatment guidelines [46]. They should be determined through a careful assessment of each case by the specialist. Similarly, in orthodontics, depending on the risk of relapse and the challenges of achieving the planned tooth movement, the evaluation should be conducted by the specialist for each case.

In every case with an RVS score of 4, although tooth extraction should not be recommended, due to increased treatment complexity, cost, and effort, the cost–benefit ratio of keeping the affected tooth should be carefully weighed against its extraction and replacement with a dental implant. Nevertheless, it should always be considered that teeth should be given priority whenever possible, since treated teeth will yield similar outcomes after 10 years of service when compared to dental implants [57].

The removal of a compromised tooth and its replacement with an implant may require additional treatments in some clinical situations to achieve optimal implant placement, such as sinus floor elevation, GBR, soft tissue grafts, etc. Generally, implant placement combined with regenerative procedures tends to be more complex and offers less predictable outcomes [58, 59]. Moreover, peri-implant diseases, especially in patients with a history of periodontitis, are highly prevalent and their current treatment remains unpredictable [60]. Therefore, the final decision on whether it is appropriate to treat a tooth with a RVS 4 must be carefully considered.

Although this RVS system offers an objective tool for the clinician to aid decision-making and improve communication between specialists and the patient, treatment planning must also account for the broader patient context. Systemic conditions, medications such as potent IV bisphosphonates, and patient age may alter prognosis and treatment options. Behavioral and socio-economic factors, timing limitations, and biological risk factors can also influence the final decision-making process [42]. Ultimately, the RVS is not intended to dictate treatment decisions, but rather to support clinicians in structuring their clinical judgment, improving risk awareness, and aligning treatment plans with realistic expectations—thereby enhancing both clinical outcomes and informed consent. As Dr. Amsterdam reflected, “we had to find some way to bring the various clinical disciplines together, we well as to relate them to the basic science and to the total human needs of the patient.” [61].

5 | Conclusion

A Restorative Value Score (RVS) system is introduced to support clinicians in planning decisions and improve communication with patients and involved specialists. This score is based on the amount of treatment needed to restore a tooth to excellent condition, considering its complexity and the number of disciplines involved (restorative-prosthodontic, periodontal-surgical, endodontic, orthodontic). In summary, the score ranges from 0 (no treatment needed) to 5 (tooth must be extracted). RVS 4 represents *advanced interdisciplinary care*, characterized by complex treatments across single or multiple disciplines. The more treatment required, the higher the score, which indicates longer, more complex, and greater procedural risk.

Funding

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

References

1. R. J. Genco and M. Sanz, "Clinical and Public Health Implications of Periodontal and Systemic Diseases: An Overview," *Periodontology 2000* 83, no. 1 (2020): 7–13.

2. S. F. Rosenstiel, M. F. Land, and J. Fujimoto, *Contemporary Fixed Prosthodontics*, 4th ed. (Mosby Elsevier, 2006).

3. A. H. W. Wiskott, *Fixed Prosthodontics—Principles and Clinics* (Quintessence Publishing Co. Ltd, 2011).

4. G. C. Kress, "Toward a Definition of the Appropriateness of Dental Treatment," *Public Health Reports* 95, no. 6 (1980): 564–571.

5. N. P. Lang and F. Muller, "Epidemiology and Oral Function Associated With Tooth Loss and Prosthetic Dental Restorations. Consensus Report of Working Group 1," *Clinical Oral Implants Research* 18, no. Suppl. 3 (2007): 46–49.

6. M. H. A. Saleh, H. Dukka, G. Troiano, et al., "External Validation and Comparison of the Predictive Performance of 10 Different Tooth-Level Prognostic Systems," *Journal of Clinical Periodontology* 48, no. 11 (2021): 1421–1429.

7. P. Cortellini, G. Stalpers, A. Mollo, and M. S. Tonetti, "Periodontal Regeneration Versus Extraction and Prosthetic Replacement of Teeth Severely Compromised by Attachment Loss to the Apex: 5-Year Results of an Ongoing Randomized Clinical Trial," *Journal of Clinical Periodontology* 38, no. 10 (2011): 915–924.

8. P. Cortellini, G. Stalpers, A. Mollo, and M. S. Tonetti, "Periodontal Regeneration Versus Extraction and Dental Implant or Prosthetic Replacement of Teeth Severely Compromised by Attachment Loss to the Apex: A Randomized Controlled Clinical Trial Reporting 10-Year Outcomes, Survival Analysis and Mean Cumulative Cost of Recurrence," *Journal of Clinical Periodontology* 47, no. 6 (2020): 768–776.

9. P. Cortellini, S. Cortellini, D. Bonaccini, G. Stalpers, A. Mollo, and J. Buti, "Treatment of Teeth With Insufficient Clinical Crowns. Long-Term Clinical Outcomes of a Minimally Invasive Crown Lengthening Approach: A Retrospective Analysis," *International Journal of Periodontics & Restorative Dentistry* 45, no. 1 (2025): 46–57.

10. S. W. Yi, I. Ericsson, G. E. Carlsson, and J. L. Wennström, "Long-Term Follow-Up of Cross-Arch Fixed Partial Dentures in Patients With Advanced Periodontal Destruction. Evaluation of the Supporting Tissues," *Acta Odontologica Scandinavica* 53, no. 4 (1995): 242–248.

11. Ø. Fardal and J. Grytten, "A Retrospective Study of Stabilizing Bridges in Patients With Stages III and IV Periodontitis: Up to 35 Years of Clinical Audit," *Journal of Clinical Periodontology* 52, no. 6 (2025): 826–835.

12. C. Tomasi, J. P. Albouy, D. Schaller, et al., "Efficacy of Rehabilitation of Stage IV Periodontitis Patients With Full-Arch Fixed Prostheses: Tooth-Supported Versus Implant-Supported: A Systematic Review," *Journal of Clinical Periodontology* 49, no. Suppl 24 (2022): 248–271.

13. B. E. Pjetursson, K. Tan, N. P. Lang, et al., "A Systematic Review of the Survival and Complication Rates of Fixed Partial Dentures (FPDs) After an Observation Period of at Least 5 Years. I. Implant Supported FPDs," *Clinical Oral Implants Research* 15, no. 6 (2004): 625–642.

14. B. E. Pjetursson and N. P. Lang, "Prosthetic Treatment Planning on the Basis of Scientific Evidence," *Journal of Oral Rehabilitation* 35, no. Suppl1 (2008): 72–79.

15. N. Mordohai, M. Reshad, S. Jivraj, and W. Chee, "Factors That Affect Individual Tooth Prognosis and Choices in Contemporary Treatment Planning," *British Dental Journal* 202, no. 2 (2007): 63–72.

16. D. Herrera, M. Sanz, M. Kebschull, et al., "Treatment of Stage IV Periodontitis: The EFP S3 Level Clinical Practice Guideline," *Journal of Clinical Periodontology* 49, no. Suppl 24 (2022): 4–71.

17. W. Becker, L. Berg, and B. E. Becker, "The Long-Term Evaluation of Periodontal Treatment and Maintenance in 95 Patients," *International Journal of Periodontics and Restorative Dentistry* 4 (1984): 54–71.

18. W. Becker, B. E. Becker, and L. E. Berg, "Periodontal Treatment Without Maintenance. A Retrospective Study in 44 Patients," *Journal of Periodontology* 55 (1984): 505–509.

19. G. Avila, P. Galindo-Moreno, S. Soehren, C. E. Misch, T. Morelli, and H. L. Wang, "A Novel Decision-Making Process for Tooth Retention or Extraction," *Journal of Periodontology* 80, no. 3 (2009): 476–491.

20. P. D. Miller, Jr., M. L. McEntire, N. M. Marlow, and R. G. Gellin, "An Evidenced-Based Scoring Index to Determine the Periodontal Prognosis on Molars," *Journal of Periodontology* 85, no. 2 (2014): 214–225, https://doi.org/10.1902/jop.2013.120675.

21. M. E. Nunn, J. Fan, X. Su, et al., "Development of Prognostic Indicators Using Classification and Regression Trees for Survival," *Periodontology 2000* 58, no. 1 (2012): 134–142.

22. M. K. McGuire and M. E. Nunn, "Prognosis Versus Actual Outcome. II. The Effectiveness of Clinical Parameters in Developing an Accurate Prognosis," *Journal of Periodontology* 67, no. 7 (1996): 658–665.

23. L. Nibali, C. Sun, A. Akcalı, X. Meng, Y. K. Tu, and N. Donos, "A Retrospective Study on Periodontal Disease Progression in Private Practice," *Journal of Clinical Periodontology* 44, no. 3 (2017): 290–297.

24. S. E. Hamp, S. Nyman, and J. Lindhe, "Periodontal Treatment of Multirooted Teeth. Results After 5 Years," *Journal of Clinical Periodontology* 2, no. 3 (1975): 126–135.

25. L. Laster, K. W. Laudenbach, and N. H. Stoller, "An Evaluation of Clinical Tooth Mobility Measurements," *Journal of Periodontology* 46, no. 10 (1975): 603–607.

26. D. Orstavik, K. Kerekes, and H. M. Eriksen, "The Periapical Index: A Scoring System for Radiographic Assessment of Apical Periodontitis," *Endodontics & Dental Traumatology* 2, no. 1 (1986): 20–34.

27. H. Esteves, A. Correia, and F. Araújo, "Classification of Extensively Damaged Teeth to Evaluate Prognosis," *Journal of the Canadian Dental Association* 77 (2011): b105.

28. P. N. Papapanou, M. Sanz, N. Buduneli, et al., "Periodontitis: Consensus Report of Workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions," *Journal of Periodontology* 89, no. Suppl 1 (2018): S173–S182.

29. A. Ravidà, M. Qazi, G. Troiano, et al., "Using Periodontal Staging and Grading System as a Prognostic Factor for Future Tooth Loss: A Long-Term Retrospective Study," *Journal of Periodontology* 91, no. 4 (2020): 454–461.

30. N. U. Zitzmann, G. Krastl, H. Hecker, C. Walter, T. Waltimo, and R. Weiger, "Strategic Considerations in Treatment Planning: Deciding When to Treat, Extract, or Replace a Questionable Tooth," *Journal of Prosthetic Dentistry* 104, no. 2 (2010): 80–91.

31. S. Hobo, L. D. Whitsett, R. Jacobi, et al., *Fundamentals of Fixed Prosthodontics*, 3rd ed. (Quintessence, 1997).

32. A. McDonald and D. Setchell, "Developing a Tooth Restorability Index," *Dental Update* 32, no. 6 (2005): 343–346.

33. S. Friedman, S. Abitbol, and H. P. Lawrence, "Treatment Outcome in Endodontics: The Toronto Study. Phase 1: Initial Treatment," *Journal of Endodontics* 29, no. 12 (2003): 787–793.

34. C. de Chevigny, T. T. Dao, B. R. Basrani, et al., "Treatment Outcome in Endodontics: The Toronto Study—Phase 4: Initial Treatment," *Journal of Endodontics* 34, no. 3 (2008): 258–263.

35. I. López-Valverde, F. Vignoletti, G. Vignoletti, C. Martin, and M. Sanz, "Long-Term Tooth Survival and Success Following Primary Root Canal Treatment: A 5- to 37-Year Retrospective Observation," *Clinical Oral Investigations* 27, no. 6 (2023): 3233–3244.

36. M. Dioguardi, M. Alovisi, A. Comba, et al., "The Influence of Indirect Bonded Restorations on Clinical Prognosis of Endodontically Treated Teeth: A Systematic Review and Meta-Analysis," *Dental Materials* 38, no. 8 (2022): e203–e219.

37. N. U. Zitzmann, G. Krastl, H. Hecker, C. Walter, and R. Weiger, "Endodontics or Implants? A Review of Decisive Criteria and Guidelines for Single Tooth Restorations and Full Arch Reconstructions," *International Endodontic Journal* 42, no. 9 (2009): 757–774.

38. M. F. Morris, T. C. Kirkpatrick, R. E. Rutledge, and W. G. Schindler, "Comparison of Nonsurgical Root Canal Treatment and Single-Tooth Implants," *Journal of Endodontics* 35, no. 10 (2009): 1325–1330.

39. G. Greenstein, J. Cavallaro, and D. Tarnow, "When to Save or Extract a Tooth in the Esthetic Zone: A Commentary," *Continuing Education in Dentistry* 29, no. 3 (2008): 136–145.

40. H. Su, H. F. Liao, J. P. Fiorellini, S. Kim, and J. Korostoff, "Factors Affecting Treatment Planning Decisions for Compromised Anterior Teeth," *International Journal of Periodontics & Restorative Dentistry* 34, no. 3 (2014): 389–398.

41. F. Vailati and U. C. Belser, "Full-Mouth Adhesive Rehabilitation of a Severely Eroded Dentition: The Three-Step Technique. Part 1," *European Journal of Esthetic Dentistry* 3, no. 1 (2008): 30–44.

42. N. Samet and A. Jotkowitz, "Classification and Prognosis Evaluation of Individual Teeth: A Comprehensive Approach," *Quintessence International* 40 (2009): 377–387.

43. J. D. Featherstone, S. Domejean-Orliaguet, L. Jenson, et al., "A Caries Risk Assessment in Practice for Age 6 Through Adult," *Journal of the California Dental Association* 35, no. 10 (2007): 703–710.

44. D. A. Young, B. B. Nový, G. G. Zeller, et al., "The American Dental Association Caries Classification System for Clinical Practice: A Report of the American Dental Association Council on Scientific Affairs," *Journal of the American Dental Association (1939)* 146, no. 2 (2015): 79–86.

45. M. S. Tonetti and M. Sanz, "Implementation of the New Classification of Periodontal Diseases: Decision-Making Algorithms for Clinical Practice and Education," *Journal of Clinical Periodontology* 46, no. 4 (2019): 398–405.

46. AAE Endodontic Case Difficulty Assessment Form, https://www.aae.org/specialty/wp-content/uploads/sites/2/2022/01/CaseDifficultyAssessmentFormFINAL2022.pdf.

47. M. Clijmans, A. Medhat, A. D. Geest, et al., "Judging Orthodontic Treatment Complexity," *Dental Press Journal of Orthodontics* 21, no. 1 (2016): 60–66.

48. G. D. Douglass, "Making a Comprehensive Diagnosis in a Comprehensive Care Curriculum," *Journal of Dental Education* 66, no. 3 (2002): 414–420.

49. M. K. McGuire and M. E. Nunn, "Prognosis Versus Actual Outcome III: The Effectiveness of Clinical Parameters in Accurately Predicting Tooth Survival," *Journal of Periodontology* 67, no. 7 (1996): 666–674.

50. 50. M. Nieri, L. Muzzi, M. Cattabriga, R. Rotundo, F. Cairo, and G. P. Pini Prato, "The Prognostic Value of Several Periodontal Factors Measured as Radiographic Bone Level Variation: A 10-Year Retrospective Multilevel Analysis of Treated and Maintained Periodontal Patients," *Journal of Periodontology* 73, no. 12 (2002): 1485–1493.

51. M. G. Newman, K. S. Kornman, and S. Holzman, "Association of Clinical Risk Factors With Treatment Outcomes," *Journal of Periodontology* 65, no. Suppl 5S (1994): 489–497.

52. L. Hirschfeld and B. Wasserman, "A Long-Term Survey of Tooth Loss in 600 Treated Periodontal Patients," *Journal of Periodontology* 49, no. 5 (1978): 225–237.

53. W. T. McFall, Jr., "Tooth Loss in 100 Treated Patients With Periodontal Disease. A Long-Term Study," *Journal of Periodontology* 53, no. 9 (1982): 539–549.

54. M. Giargia and J. Lindhe, "Tooth Mobility and Periodontal Disease," *Journal of Clinical Periodontology* 24, no. 11 (1997): 785–795.

55. T. Blieden, "Tooth-Related Issues," *Annals of Periodontology* 4, no. 1 (1999): 91–97.

56. L. Nibali, A. Akcalı, and S. G. Rüdiger, "The Importance of Supportive Periodontal Therapy for Molars Treated With Furcation Tunnelling," *Journal of Clinical Periodontology* 46, no. 12 (2019): 1228–1235.

57. P. Holm-Pedersen, N. P. Lang, and F. Muller, "What Are the Longevities of Teeth and Oral Implants?," *Clinical Oral Implants Research* 18, no. Suppl 3 (2007): 15–19.

58. F. Graziani, N. Donos, I. Needleman, M. Gabriele, and M. Tonetti, "Comparison of Implant Survival Following Sinus Floor Augmentation Procedures With Implants Placed in Pristine Posterior Maxillary Bone: A Systematic Review," *Clinical Oral Implants Research* 15, no. 6 (2004): 677–682.

59. M. Esposito, M. G. Grusovin, P. Felice, et al., "Interventions for Replacing Missing Teeth: Horizontal and Vertical Bone Augmentation Techniques for Dental Implant Treatment," *Cochrane Database of Systematic Reviews* 2009, no. 4 (2009): CD003607.

60. T. Berglundh, A. Mombelli, F. Schwarz, and J. Derks, "Etiology, Pathogenesis and Treatment of Peri-Implantitis: A European Perspective," *Periodontology 2000* (2024): 1–36, https://doi.org/10.1111/prd.12549.

61. M. Amsterdam, "Periodontal Prosthesis. 25 Years in Retrospect," *Alpha Omegan* 7 (1974): 577–589.