

Splinting in Periodontal Therapy: Biological Rationale, Clinical Evidence, Contemporary Applications, and Future Directions

Running Title: Splinting in Periodontal Therapy

Navi Bansal¹, Ridhi Karwal², Mohammed Muzaffar Khan², Ankit Kumar¹

¹Department of Periodontology, Post Graduate Institute of Dental Sciences (PGIDS), Rohtak, Haryana, India

²Department of Conservative Dentistry and Endodontics, Post Graduate Institute of Dental Sciences (PGIDS), Rohtak, Haryana, India

Corresponding author: Dr Navi Bansal, Department of Periodontology, Post Graduate Institute of Dental Sciences, Rohtak, Haryana 124001, India.

Declarations of interest: None

ABSTRACT

Background: Tooth mobility is a common consequence of advanced periodontal attachment and alveolar bone loss and may impair mastication, comfort, function and oral health-related quality of life. Periodontal splinting is widely used to stabilize mobile teeth; however, its independent contribution to periodontal healing, tooth survival and patient-reported outcomes remains uncertain.

Objective: To critically evaluate the biological rationale and clinical evidence for periodontal splinting, with particular emphasis on its effects on tooth mobility, periodontal parameters, tooth survival, splint longevity, patient-centered outcomes and its role within contemporary periodontal therapy.

Methods: A narrative review of the periodontal literature was undertaken, prioritizing systematic reviews, randomized clinical trials, prospective and long-term observational studies, consensus reports and contemporary clinical practice guidelines.

Results: Available evidence supports periodontal splinting primarily as a mechanical intervention that reduces tooth mobility and may improve functional comfort in appropriately selected patients. Early controlled studies did not demonstrate a consistent additional benefit of splinting on periodontal healing compared with periodontal therapy alone. Long-term observational studies indicate that splinted teeth can remain functional for prolonged periods during supportive periodontal therapy, although splint fracture and repair are frequent. A systematic review found insufficient evidence to establish that splinting improves tooth survival or periodontal outcomes, with the certainty of evidence considered very low.

Conclusions: Periodontal splinting should be regarded as a selective adjunct to comprehensive periodontal therapy rather than a disease-modifying treatment. Its principal indications are persistent mobility associated with functional discomfort, compromised mastication or difficulty during periodontal treatment. Long-term tooth retention remains dependent on periodontal disease control and supportive periodontal care rather than immobilization alone.

Keywords: periodontal splinting; tooth mobility; periodontitis; tooth survival; supportive periodontal therapy; fiber-reinforced composite; oral health-related quality of life; stage IV periodontitis.

INTRODUCTION

Periodontitis causes progressive destruction of the periodontal ligament, connective tissue attachment and alveolar bone, resulting in loss of periodontal support and, in advanced disease, pathological tooth mobility.[1,2] Tooth mobility

is not synonymous with active periodontal inflammation: it may reflect reduced periodontal support, transient inflammatory changes, occlusal trauma, tooth morphology, root configuration or a combination of these factors.[3-5] Hypermobile teeth can interfere with chewing, produce discomfort during function, contribute to patient anxiety regarding tooth loss, and complicate instrumentation or regenerative treatment. Consequently, splinting has traditionally been used to stabilize mobile teeth and redistribute functional forces to adjacent teeth.[6]

Splinting mechanically reduces movement, but it does not directly regenerate lost periodontal attachment or eliminate the microbial biofilm responsible for periodontitis. Early clinical studies demonstrated that mobility frequently decreases following periodontal debridement, plaque control and management of occlusal factors even without splinting.[4,7,8] This observation remains central to contemporary treatment planning.

The 2017 classification identifies tooth mobility as a component of disease complexity, while the EFP S3 guideline for stage IV periodontitis permits temporary splinting and/or limited occlusal adjustment during periodontal therapy when hypermobility compromises comfort or treatment.[2,9] Importantly, the EFP recommendation is based on **very-low-certainty evidence** and emphasizes reassessment after periodontal treatment rather than automatic long-term splinting.[10]

The purpose of this review is therefore not merely to describe available splinting techniques, but to critically examine what is known regarding their biological rationale, periodontal effects, tooth survival, patient-centered benefits, technical complications and appropriate clinical use.

HISTORICAL PERSPECTIVE AND EVOLUTION OF THE CONCEPT

Splinting has been used in dentistry for centuries, initially through relatively rigid mechanical methods intended to stabilize loose teeth.[6,11] Historically, the rationale was predominantly mechanical: immobilization was expected to decrease harmful movement and permit periodontal tissues to recover.

The biological rationale evolved considerably during the twentieth century. Nyman and Lang emphasized that tooth mobility reflects the interaction between periodontal support and functional loading rather than representing an independent disease process.[3] The classic periodontal literature subsequently demonstrated that inflammation and occlusal factors may contribute to mobility, and that mobility can decrease following successful periodontal therapy.[4,7,8]

Kegel et al. compared splinted and unsplinted segments during initial periodontal treatment and found no additional reduction in mobility attributable to splinting.[7] Similarly, Fleszar et al., in an eight-year longitudinal study of 1,974 teeth, demonstrated that mobility influenced periodontal treatment outcomes but that periodontal therapy itself could substantially modify mobility.[4] Kerry et al. subsequently reported reductions in mobility following initial non-surgical treatment, with temporary increases after some surgical procedures.[8]

Thus, the contemporary concept is substantially more nuanced: splinting is primarily a mechanical and patient-centered intervention rather than a substitute for periodontal therapy.

BIOLOGICAL AND MECHANISTIC BASIS

Tooth mobility and periodontal support

Loss of alveolar bone and periodontal ligament support reduces the effective periodontal support area and consequently increases displacement under functional loading.[3] Inflammation can further increase mobility through alterations in periodontal ligament tissue, vascular changes and inflammatory edema. Conversely, successful control of periodontal inflammation may reduce mobility without restoration of lost attachment.[4,8] Long-term epidemiological evidence indicates that mobility is associated with increased risk of tooth loss. A 2019 systematic review and meta-analysis identified mobility as an important tooth-level predictor of tooth loss, with a pooled odds ratio of approximately 3.7.[22]

Mechanical redistribution of functional forces

The principal mechanical effect of a splint is to couple several teeth into a functional unit. A mobile tooth therefore shares occlusal loading with adjacent teeth with greater periodontal support. This can decrease individual tooth displacement and improve functional stability. However, force redistribution should not be interpreted as elimination of the underlying periodontal disease. If periodontal inflammation persists, splinting may simply stabilize a tooth while the disease continues to progress. The distinction is important because tooth survival depends on multiple variables, including residual periodontal support, residual pocket depth, smoking, systemic disease, supportive periodontal care, tooth morphology and furcation involvement.[19,22-24]

Occlusal trauma and splinting

Experimental and clinical evidence suggests that excessive occlusal forces can produce adaptive periodontal changes and may modify tissue destruction in the presence of inflammation, but occlusal trauma should not be regarded as the primary cause of plaque-induced periodontitis.[12,25] Consequently, splinting should not be viewed as a treatment for periodontitis itself. Rather, it may be used to manage the functional consequences of reduced periodontal support, particularly when secondary occlusal trauma or fremitus contributes to discomfort. The EFP stage IV guideline accordingly recommends temporary splinting and/or limited selective occlusal adjustment in selected patients with hypermobility, particularly during initial periodontal treatment.[10]

CLINICAL EVIDENCE

Early controlled studies

The earliest controlled studies provide an important counterpoint to the assumption that immobilization itself improves periodontal healing.

Kegel et al. evaluated seven patients with chronic destructive periodontitis using a split-mouth design. Mobility decreased in both splinted and unsplinted segments, with no significant additional reduction attributable to splinting.[7] The authors attributed improvement largely to reduced inflammation and improved occlusal relationships.

Galler et al. subsequently examined splinting following osseous surgery in 10 patients and similarly questioned whether splinting provided additional benefit for mobility, bone levels or attachment compared with unsplinted teeth.[13]

Alkan et al. later randomized 29 patients with mobile mandibular anterior teeth to different sequences of scaling and root planing and splinting. Splinting before instrumentation, intended to prevent instrumentation-induced trauma, did not improve periodontal healing compared with splinting after treatment.[14]

These studies are limited by small sample sizes, older treatment protocols and older splint designs. Nevertheless, their consistency is clinically informative: mechanical immobilization should not be assumed to enhance periodontal healing merely because mobility is reduced.

Randomized and prospective contemporary evidence

More recent trials have shifted attention toward timing, patient-centered outcomes and adjunctive treatment strategies. Sonnenschein et al. conducted a randomized clinical study involving patients with grade II/III mobile mandibular incisors. Both groups received full-mouth disinfection, while the test group additionally received splinting. At three months, periodontal therapy improved PPD, CAL and OHRQoL in both groups. The splinted group showed a greater numerical reduction in OHIP-14 scores, although the between-group difference did not reach statistical significance.[17]

This finding is important because the principal benefit of splinting may not be detectable through CAL or PPD. A patient who can chew comfortably on a stabilized tooth may experience a clinically meaningful improvement despite minimal additional change in periodontal measurements. This supports incorporation of patient-reported outcomes into future trials.

A related randomized study examined whether mandibular incisors should be splinted before or after full-mouth disinfection. Twenty-six of 34 randomized participants completed the 12-month reassessment. Both groups improved, while two patients assigned to delayed splinting no longer required splinting after periodontal treatment because mobility had decreased. The study did not demonstrate a statistically significant advantage of either timing strategy.[18] This finding supports an important clinical principle: splinting after initial periodontal therapy allows the clinician to identify teeth whose mobility improves sufficiently without permanent stabilization.

A 2025 randomized trial investigated elastic occlusal splints for mobile posterior teeth in stage III/IV periodontitis. Thirty-eight patients were randomized to splinting or no splinting during steps 1 and 2 of periodontal therapy. The splint group demonstrated improvements in masticatory efficiency, mobility and PPD.[19] Although clinically interesting, the short 6–8-week follow-up and relatively small sample restrict conclusions regarding long-term periodontal benefit.

Evidence from Systematic Reviews and Meta-analyses

The most important synthesis remains the systematic review by Dommisch et al., which evaluated tooth splinting and occlusal adjustment in patients with periodontitis and masticatory dysfunction.[15] The search identified 1,515 publications, but only two retrospective case series evaluating splinting fulfilled the principal eligibility criteria. Across 72 patients, 26 of 311 splinted teeth were lost compared with 156 of 1,541 non-splinted teeth, corresponding to weighted tooth-loss incidences of 8.4% and 10.1%, respectively, over approximately two years or more following non-surgical periodontal therapy.[15]

The apparent numerical difference should not be interpreted as evidence of a survival benefit because the underlying studies were observational and potentially affected by treatment-selection bias. Clinicians may preferentially splint teeth judged retainable, while hopeless or severely compromised teeth may be excluded from splinting. Conversely, more severely mobile teeth are more likely to receive splints, creating confounding by indication.

The review concluded that there was insufficient evidence that splinting improves tooth survival or periodontal parameters and rated the evidence as low/very low certainty.[15] The subsequent EFP stage IV guideline retained this cautious interpretation and assigned **very-low certainty** to the evidence supporting splinting.[10]

OBSERVATIONAL EVIDENCE AND LONG-TERM TOOTH RETENTION

Several observational studies provide reassuring evidence regarding the feasibility of retaining splinted teeth.

Sonnenschein et al. followed 39 patients with 162 splinted mandibular anterior teeth during supportive periodontal therapy for up to 15 years. No splinted teeth were lost during the first three years; only two teeth were lost during the longer observation period. PPD and CAL improved and subsequently remained relatively stable, while splint survival without fracture or debonding was approximately 74% at three years.[16]

Graetz et al. evaluated 227 splinted teeth in 57 periodontitis patients over a mean of 11 years. Twenty-six teeth were extracted, but splinted teeth did not demonstrate a statistically significant increase in tooth-loss risk compared with non-splinted teeth after adjustment. However, 75.3% of splints required repair, averaging 2.6 repairs per splint.[17]

Zhang et al. subsequently reported 161 splints in 61 patients followed for approximately 5.4 years. None of the splinted teeth were extracted during the observation period, although overall splint survival was approximately 65%. Composite-resin-only splints were more prone to breakage than composite splints reinforced with mesh.[18]

Collectively, these studies support the feasibility of long-term retention but do not establish efficacy. Their populations are highly selected, generally treated in specialist settings, and enrolled in supportive periodontal therapy. Therefore, their results cannot be extrapolated to patients with uncontrolled inflammation, poor plaque control or irregular maintenance.

SPLINT MATERIALS AND TECHNICAL CONSIDERATIONS

Modern periodontal splints include wire-composite systems, polyethylene or glass-fiber-reinforced composite splints, direct composite splints and laboratory-fabricated or CAD/CAM devices.[11, 26-28]

Fiber-reinforced composite systems have become particularly popular because they offer favourable aesthetics, relatively conservative preparation, repairability and flexibility. A prospective pilot study of 19 patients with grade III mobility reported 94.8% splint survival over up to 4.5 years, although the absence of a control group prevents conclusions regarding periodontal efficacy.[29]

A small clinical comparison of polyethylene-fiber/composite and stainless-steel-wire/composite splints reported greater reduction in mobility with the fiber system and acceptable short-term clinical performance.[30] Another randomized study comparing fiber-reinforced composite with wire ligation suggested lower plaque and bleeding indices around fiber splints, but the methodological limitations and relatively short follow-up warrant cautious interpretation.[31]

The major clinical problem remains **maintenance**. Splints may fracture, debond or accumulate plaque, and their presence can make interdental cleaning and professional instrumentation more difficult. Long-term observational data consistently show that repair is common.[16-18]

Digital workflows are now emerging. CAD/CAM-designed splints and digitally guided bonding techniques can improve adaptation and reduce unwanted displacement of mobile teeth during insertion.[32-33] However, these are technical innovations rather than evidence of improved periodontal outcomes. Their clinical value should ultimately be assessed against conventional splints in controlled comparative studies.

CLINICAL IMPLICATIONS

The current evidence supports a selective rather than routine approach.

First, the underlying periodontal disease must be treated. Plaque control, subgingival instrumentation, risk-factor management and supportive periodontal care remain fundamental.[1-9]

Second, mobility should be reassessed after initial periodontal treatment. A tooth that becomes sufficiently stable after inflammation is controlled may not require long-term splinting. This approach avoids unnecessary restorative intervention and facilitates oral hygiene.

Third, splinting is particularly reasonable when mobility produces functional discomfort, compromises chewing, interferes with periodontal treatment or is expected to increase temporarily after periodontal surgery. The EFP stage IV guideline specifically allows temporary splinting during periodontal therapy to improve patient comfort and facilitate treatment.[10]

Fourth, long-term splinting may be considered for a tooth with persistent hypermobility after successful periodontal therapy when the tooth remains periodontally maintainable and the patient values retention. The decision should be based on residual periodontal support, mobility, restorability, plaque control, occlusion, patient preference and anticipated maintenance requirements.

Finally, splinting should never be used to justify retention of a tooth that is biologically or restoratively hopeless. The ability to stabilize a tooth mechanically is not equivalent to evidence that the tooth has a favourable periodontal prognosis.

LIMITATIONS OF THE CURRENT EVIDENCE

The principal limitation is the scarcity of adequately powered randomized clinical trials directly comparing splinting with no splinting.

The evidence base is also heterogeneous with respect to:

- disease severity and historical diagnostic definitions;
- mobility grading systems;
- splint material and design;
- splint duration;
- periodontal treatment protocols;
- timing of splint placement;
- maintenance intervals;
- tooth location;
- definitions of splint failure;
- periodontal and patient-reported outcomes.

Selection bias is particularly important in observational studies. Teeth chosen for splinting are not randomly selected; clinicians may select teeth that are mobile but potentially maintainable. This makes direct comparisons with unsplinted teeth susceptible to confounding by indication.

The current literature therefore supports the conclusion that splinting is clinically feasible and potentially beneficial for comfort and function, but does not establish that it improves periodontal disease control or tooth prognosis.

CONCLUSIONS

Periodontal splinting remains an established adjunct in the management of mobile teeth, particularly in advanced periodontitis. Its strongest rationale is mechanical stabilization, improvement of function and patient comfort, and facilitation of periodontal treatment. The available evidence does not demonstrate that splinting independently controls periodontitis, regenerates periodontal attachment or improves tooth survival.

Contemporary EFP guidance therefore appropriately positions splinting as a selective, individualized intervention, particularly for hypermobile teeth in stage IV periodontitis, rather than as routine treatment for mobility.

REFERENCES

- [1]. Papapanou PN, Sanz M, Buduneli N, Dietrich T, Feres M, Fine DH, et al. Periodontitis: consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Clin Periodontol*. 2018;45(Suppl 20). doi:10.1111/jcpe.12946. PMID: 29926490.
- [2]. Tonetti MS, Greenwell H, Kornman KS. Staging and grading of periodontitis: framework and proposal of a new classification and case definition. *J Clin Periodontol*. 2018;45(Suppl 20). doi:10.1111/jcpe.12945.
- [3]. Nyman SR, Lang NP. Tooth mobility and the biological rationale for splinting teeth. *Periodontol* 2000. 1994;4:15-22. doi:10.1111/j.1600-0757.1994.tb00002.x.
- [4]. Fleszar TJ, Knowles JW, Morrison EC, Burgett FG, Nissle RR, Ramfjord SP. Tooth mobility and periodontal therapy. *J Clin Periodontol*. 1980;7(6):495-505. doi:10.1111/j.1600-051X.1980.tb02156.x. PMID:6938529.
- [5]. Lindhe J, Nyman S. The effect of plaque control and surgical pocket elimination on the establishment and maintenance of periodontal health. A longitudinal study of periodontal therapy in cases of advanced disease. *J Clin Periodontol*. 1975;2(2):67-79. doi:10.1111/j.1600-051X.1975.tb01727.x. PMID:1055729.

- [6]. Watkins SJ, Hemmings KW. Periodontal splinting in general dental practice. *Dent Update*. 2000;27(6):278-285. doi:10.12968/denu.2000.27.6.278. PMID:11218464.
- [7]. Kegel W, Selipsky H, Phillips C. The effect of splinting on tooth mobility. I. During initial therapy. *J Clin Periodontol*. 1979;6(1):45-58. doi:10.1111/j.1600-051X.1979.tb02290.x. PMID:285081.
- [8]. Kerry GJ, Morrison EC, Ramfjord SP, Hill RW, Caffesse RG, Nissle RR, et al. Effect of periodontal treatment on tooth mobility. *J Periodontol*. 1982;53(10):635-638. doi:10.1902/jop.1982.53.10.635. PMID:6754904.
- [9]. Sanz M, Herrera D, Kebschull M, Chapple I, Jepsen S, Berglundh T, et al. Treatment of stage I-III periodontitis—The EFP S3 level clinical practice guideline. *J Clin Periodontol*. 2020;47(Suppl 22):4-60. doi:10.1111/jcpe.13290.
- [10]. Herrera D, Sanz M, Kebschull M, Jepsen S, Sculean A, Berglundh T, et al. Treatment of stage IV periodontitis: the EFP S3 level clinical practice guideline. *J Clin Periodontol*. 2022;49(Suppl 24):4-71. doi:10.1111/jcpe.13639. PMID:35688447.
- [11]. Kathariya R, Devanoorkar A, Golani R, Shetty N, Vallakatla V, Bhat MYS. To splint or not to splint: the current status of periodontal splinting. *J Int Acad Periodontol*. 2016;18(2):45-56. PMID:27128157.
- [12]. Branschofsky M, Beikler T, Schäfer R, Flemming TF, Lang H. Secondary trauma from occlusion and periodontitis. *Quintessence Int*. 2011;42(6):515-522. PMID:21519589.
- [13]. Galler C, Selipsky H, Phillips C, Ammons WF Jr. The effect of splinting on tooth mobility. II. After osseous surgery. *J Clin Periodontol*. 1979;6(5):317-333. doi:10.1111/j.1600-051X.1979.tb01933.x. PMID:294458.
- [14]. Alkan A, Aykaç Y, Bostanci H. Does temporary splinting before non-surgical therapy eliminate scaling and root planing-induced trauma to the mobile teeth? *J Oral Sci*. 2001;43(4):249-254. doi:10.2334/josnurd.43.249. PMID:11848191.
- [15]. Dommisch H, Walter C, Difloe-Geisert JC, Gintaute A, Jepsen S, Zitzmann NU. Efficacy of tooth splinting and occlusal adjustment in patients with periodontitis exhibiting masticatory dysfunction: a systematic review. *J Clin Periodontol*. 2022;49(Suppl 24):149-166. doi:10.1111/jcpe.13563. PMID:34854115.
- [16]. Sonnenschein SK, Betzler C, Rütters MA, Krisam J, Saure D, Kim TS. Long-term stability of splinted anterior mandibular teeth during supportive periodontal therapy. *Acta Odontol Scand*. 2017;75(7):475-482. doi:10.1080/00016357.2017.1340668. PMID:28643542.
- [17]. Graetz C, Ostermann F, Woeste S, Sälzer S, Dörfer CE, Schwendicke F. Long-term survival and maintenance efforts of splinted teeth in periodontitis patients. *J Dent*. 2019;80:49-54. doi:10.1016/j.jdent.2018.10.009. PMID:30389428.
- [18]. Sonnenschein SK, Ziegler P, Ciardo A, Ruetters M, Krisam J, Kim TS. The impact of splinting mobile mandibular incisors on oral health-related quality of life—preliminary observations from a randomized clinical trial. *J Clin Periodontol*. 2021;48(6):816-825. doi:10.1111/jcpe.13454. PMID:33751644.
- [19]. Sonnenschein SK, Ciardo A, Kilian S, Ziegler P, Ruetters M, Spindler M, et al. The impact of splinting timepoint of mobile mandibular incisors on the outcome of periodontal treatment—preliminary observations from a randomized clinical trial. *Clin Oral Investig*. 2022;26(1):921-930. doi:10.1007/s00784-021-04075-4. PMID:34309736.
- [20]. Hamdy S, Turkey M, Gamal AY. Does minimally invasive non-surgical therapy improve outcomes in splinted mandibular incisors? Results from a randomized trial. *BMC Oral Health*. 2026;26:1192. doi:10.1186/s12903-026-08788-4.
- [21]. Peditto M, Rupe C, Gambino G, Di Martino M, Barbato L, Cairo F, et al. Influence of mobility on the long-term risk of tooth extraction/loss in periodontitis patients: a systematic review and meta-analysis. *J Periodontol Res*. 2024;59(6):1047-1061. doi:10.1111/jre.13286. PMID:38766764.
- [22]. Helal O, Göstemeyer G, Krois J, Fawzy El Sayed K, Graetz C, Schwendicke F. Predictors for tooth loss in periodontitis patients: systematic review and meta-analysis. *J Clin Periodontol*. 2019;46(7):699-712. doi:10.1111/jcpe.13118. PMID:31025366.
- [23]. Siow J, et al. Risk factors for tooth loss and progression of periodontitis in patients undergoing periodontal maintenance therapy. *J Clin Periodontol*. 2023;50. doi:10.1111/jcpe.13721.
- [24]. Hasan F, Magan-Fernandez A, Akcalı A, Sun C, Donos N, Nibali L. Tooth loss during supportive periodontal care: a prospective study. *J Clin Periodontol*. 2024;51(5):583-595. doi:10.1111/jcpe.13943. PMID:38409875.
- [25]. Ramfjord SP, Ash MM Jr. Significance of occlusion in the etiology and treatment of early, moderate, and advanced periodontitis. *J Periodontol*. 1981;52(9):511-517. doi:10.1902/jop.1981.52.9.511. PMID:6793705.
- [26]. Sekhar LC, Koganti VP, Shankar BR, Gopinath A. A comparative study of temporary splints: bonded polyethylene fiber reinforcement ribbon and stainless steel wire + composite resin splint in the treatment of chronic periodontitis. *J Contemp Dent Pract*. 2011;12(5):343-349. doi:10.5005/jp-journals-10024-1057. PMID:22269194.
- [27]. Xu J, Xu B, Song L. Evaluation of the fiber-reinforced composite periodontal splint on fixing loose teeth with severe periodontitis. *Shanghai Kou Qiang Yi Xue*. 2013;22(1):81-84. PMID:23552787.
- [28]. Kumbuloglu O, Saracoglu A, Özcan M. Pilot study of unidirectional E-glass fibre-reinforced composite resin splints: up to 4.5-year clinical follow-up. *J Dent*. 2011;39(12):871-877. doi:10.1016/j.jdent.2011.09.012. PMID:22001066.

- [29]. Burgett FG, Ramfjord SP, Nissle RR, Morrison EC, Charbeneau TD, Caffesse RG. A randomized trial of occlusal adjustment in the treatment of periodontitis patients. *J Clin Periodontol.* 1992;19(6):381-387. doi:10.1111/j.1600-051X.1992.tb00666.x. PMID:1634627.
- [30]. Zhang Y, Kang N, Xue F, Duan J, Chen F, Cai Y, et al. Survival of nonsurgically splinted mandibular anterior teeth during supportive maintenance care in periodontitis patients. *J Dent Sci.* 2023;18(1):229-236. doi:10.1016/j.jds.2022.05.025. PMID:36643235.
- [31]. Hui S, Hong Y, Chen S, Bao Y, Song J, Zhao Y, et al. Efficacy of maxillary occlusal splints on mobile posterior teeth in patients with stage III or IV periodontitis during steps 1 and 2 of periodontal therapy: a randomized parallel-controlled clinical trial. *Clin Oral Investig.* 2025;29:425. doi:10.1007/s00784-025-06506-y. PMID:40875065.
- [32]. Zhang C, Liu Q, Yang J, Hou J. A digital technique for splinting periodontally compromised mobile teeth in the mandibular anterior region. *J Prosthet Dent.* 2021;125(4):560-563. doi:10.1016/j.prosdent.2020.03.004. PMID:32414586.
- [33]. Liu Y, Bai S, Zhong S, Liu H, Tian M, Niu L, et al. Digital workflow for periodontal splinting with a guided device. *J Esthet Restor Dent.* 2023;35(4):621-624. doi:10.1111/jerd.13026. PMID:36810946.
- [34]. Buset SL, Walter C, Friedmann A, Weiger R, Borgnakke WS, Zitzmann NU. Are periodontal diseases really silent? A systematic review of their effect on quality of life. *J Clin Periodontol.* 2016;43(4):333-344. doi:10.1111/jcpe.12517. PMID:26810308.
- [35]. McGuire MK, Nunn ME. Prognosis versus actual outcome. III. The effectiveness of clinical parameters in accurately predicting tooth survival. *J Periodontol.* 1996;67(7):666-674. doi:10.1902/jop.1996.67.7.666. PMID:8832477.

Table 1. Major controversies surrounding periodontal splinting

Clinical question	Current evidence	Interpretation
Does splinting improve periodontal healing?	Early controlled studies do not demonstrate a clear independent effect	Insufficient evidence for a disease-modifying effect
Does splinting improve tooth survival?	Long-term cohorts show good retention, but systematic review evidence is very limited	Feasibility demonstrated; efficacy unproven
Should every mobile tooth be splinted?	Mobility often decreases after periodontal therapy	No; reassessment is essential
Should splinting be performed before instrumentation?	Randomized evidence does not show clear benefit	Timing should be individualized
Does splinting improve OHRQoL?	Preliminary RCT evidence suggests possible benefit	Promising but underpowered
Which material is superior?	Fiber-reinforced systems appear clinically convenient, but comparative evidence is limited	No definitive material hierarchy
Should splinting be permanent?	Some teeth remain stable long-term, but many require repeated repairs	Long-term splinting should be reassessed periodically
Does splinting prevent tooth loss?	Not demonstrated	Splinting should not be presented as a prognostic treatment

Table 2. Landmark and contemporary clinical studies

Study	Design/population	Intervention	Main outcome	Principal interpretation
Kegel et al., 1979 ⁷	Split-mouth; 7 patients	Wire-acrylic splint	Mobility	No additional mobility reduction from splinting
Galler et al., 1979 ¹³	Comparative clinical study; 10 patients	Splint after osseous surgery	Mobility, attachment, bone	No convincing additional benefit
Fleszar et al., 1980 ⁴	Longitudinal; 82 patients, 1,974 teeth	Periodontal therapy	Mobility and treatment response	Mobility is prognostically relevant but can improve with therapy
Kerry et al., 1982 ⁸	Comparative; 93 patients, 2,421 teeth	Various periodontal treatments	Mobility	Initial therapy reduced mobility
Alkan et al., 2001 ¹⁴	Randomized; 29 patients	Splint before/after SRP	PPD, PAL, mobility	No clear benefit to pre-treatment splinting
Kumbuloglu et al., 2011 ²⁹	Prospective pilot; 19 patients	E-glass FRC	Splint survival	High technical survival; no comparator
Sonnenschein et al., 2017 ¹⁶	Retrospective; 39 patients, 162 teeth	FRC splints + SPT	Tooth/splint survival	Good tooth retention; splint failures occurred

Graetz et al., 2019 ¹⁷	Retrospective; 57 patients, 227 teeth	Splint + periodontal therapy	Tooth survival/repairs	No significant excess tooth-loss risk; frequent repairs
Sonnenschein et al., 2021 ¹⁸	Randomized; mobile mandibular incisors	Splint before/after FMD	Periodontal parameters	No clear optimal timing
Sonnenschein et al., 2021 ¹⁷	Randomized	FMD ± splint	OHIP-14	Possible additional OHRQoL benefit
Zhang et al., 2023 ¹⁹	Retrospective; 61 patients, 161 splints	Splint + SPT	Tooth/splint survival	No extractions; splint survival ~65%
Hui et al., 2025 ¹⁹	RCT; 38 stage III/IV patients	Elastic occlusal splint	Mobility, masticatory efficiency	Short-term functional benefit
Hamdy et al., 2026 ²⁰	RCT; 39 patients, 46 sites	MINST vs all splinted	PPD, CAL, pocket closure	Both improved; MINST produced greater pocket closure

Table 3. Systematic reviews and guidelines

Source	Main question	Principal conclusion
Dommisch et al., 2022 ¹⁵	Splinting/occlusal adjustment in periodontitis	Evidence for splinting is very limited; no demonstrated survival benefit
EFP S3 Stage IV guideline, 2022 ¹⁰	Clinical management of stage IV disease	Temporary splinting may be considered to improve comfort/facilitate therapy; evidence very low
Helal et al., 2019 ²²	Predictors of tooth loss	Mobility, deep pockets and bone loss associated with higher tooth-loss risk
Peditto et al., 2024 ²¹	Long-term impact of mobility	Increasing mobility associated with greater long-term tooth-loss risk, but mobility alone should not mandate extraction
Buset et al., 2016 ³⁴	Periodontitis and OHRQoL	Periodontal disease adversely affects OHRQoL
Sanz et al., 2020 ⁹	Stage I–III periodontal therapy	Stepwise periodontal treatment and supportive care remain fundamental