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Evaluating Navigated and Guided Surgery in Dental Implantology: A Review

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ABSTRACT

Introduction: Navigated surgery (NS) and guided surgery (GS) are computer-assisted technologies that have enhanced precision and predictability in dental implantology. While both approaches improve outcomes over freehand placement, they differ in accuracy, efficiency, and clinical application.

Materials and Methods: This article is a narrative comparative review. We searched PubMed, Scopus, Web of Science, and the Cochrane Library (January 2020–August 2025) for studies directly comparing navigated (NS) and guided (GS) implant surgery. Eligible designs included randomized trials, cohort studies, and systematic reviews. Outcomes assessed were placement accuracy, survival, operative time, complications, and patient/clinician-reported measures. Of 130 records, 47 duplicates were removed; 11 studies were included.

Results: The 11 included studies assessed over 7,500 implants. Meta-analyses found that while NS and GS showed similar coronal and apical accuracy, NS resulted in lower angular deviation. Clinical trials confirmed that GS significantly reduced surgical time. Both techniques demonstrated high implant survival rates (exceeding 95%) with minimal complications and high clinician and patient satisfaction.

Conclusion: Both NS and GS provide accurate and reliable implant placement, each with distinct advantages. NS offers superior angular precision and intraoperative adaptability for anatomically complex cases, while GS provides greater efficiency and simplicity of workflow for routine procedures. As such, these technologies should be considered complementary tools in modern dentistry. Future research should focus on long-term outcomes, cost-effectiveness, and patient-reported measures to better inform clinical decision-making.

Keywords: Dental implants; Digital dentistry; Guided surgery; Navigation, Computer-assisted; Oral surgical procedures.

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Introduction

The loss of permanent teeth is a significant global health problem, particularly among older populations. It is associated with a diminished quality of life, impaired chewing function, and compromised social well-being [1]. This condition, known as edentulism, may result from caries, periodontitis, trauma, or systemic diseases. It remains highly prevalent in both developed and developing countries [2]. Dental implants have emerged as the standard of care for replacing missing teeth due to their excellent long-term survival and functional outcomes [3]. Clinical studies have reported implant survival rates exceeding 90% over ten years, especially when placement is performed under controlled, prosthetically driven conditions [4]. These high survival rates, however, depend heavily on precise implant positioning. The increasing demand for functionally and aesthetically successful implant outcomes has shifted focus toward high-precision placement strategies, particularly in anatomically challenging regions such as the esthetic zone [5].

Successful implant therapy requires accurate three-dimensional (3D) placement of the implant in relation to anatomical structures and prosthetic goals [6]. Any deviation from the planned implant position can lead to esthetic failures, prosthetic misalignment, or biological complications such as peri-implantitis [4]. Inaccurate placement also increases the risk of biomechanical overload, which may lead to bone loss and implant failure [7]. Historically, implants were placed using a freehand technique based on two-dimensional radiographs and the surgeon's clinical experience, a method associated with greater positional variability and an increased risk of deviation [8]. These methods are prone to cumulative errors, especially in cases requiring precise angulation and depth control, such as sinus elevation or proximity to nerves [9].

To address the limitations of freehand surgery, digital implantology has advanced significantly with the adoption of computer-assisted surgical workflows [6]. Two main forms have emerged: static guided surgery (GS) and dynamic navigated surgery (NS), both designed to improve surgical accuracy and reduce complication rates [10]. While static guides rely on pre-fabricated templates to transfer the planned position, dynamic systems allow real-time adjustment of implant trajectory during surgery, improving adaptability to intraoperative changes [11]. Despite the advancements in computer-assisted surgery, there is a lack of high-quality, long-term studies comparing the outcomes of static guided surgery and dynamic navigated surgery. Many existing studies have short follow-up periods, making it difficult to draw reliable conclusions about long-term implant survival or the health of the tissues around the implant [12]. Recent meta-analyses have emphasized that most studies focus on short-term deviation metrics rather than clinical outcomes like soft tissue stability or prosthetic success [13]. Furthermore, few high-quality trials have evaluated the cost-effectiveness of these technologies, despite the significant investment required for dynamic navigation and robotic systems [10]. Finally, patient-reported outcomes (PROs), such as pain, esthetics, and satisfaction, are often underreported, even though they are crucial for clinical decision-making and for understanding the patient's experience [12].

Another critical consideration is the operator learning curve. Evidence suggests that dynamic navigation may offer a more favorable learning trajectory compared to static guides, particularly for novice clinicians [14], Additionally, dynamic systems have been shown to reduce angular deviation regardless of the surgeon's prior experience, making them potentially more accessible in general practice settings [15]. Workflow improvements and adjunctive technologies such as artificial intelligence and robotics are reshaping guided surgery [16]. Robotic systems have demonstrated even lower deviation values than dynamic and static techniques, particularly in angular control [17]. Augmented reality platforms are also emerging, providing surgeons with immersive real-time feedback and potentially reducing the cognitive load during complex surgeries [18].

Given the rapid evolution of digital surgical technologies and the growing, yet incomplete, body of comparative data, a focused and critical review is necessary. This review is justified as it will synthesize the current evidence and address the existing uncertainties regarding the two main digital implant placement techniques. By critically evaluating navigated (NS) and guided (GS) implant placement techniques, with an emphasis on surgical accuracy, clinical outcomes, operative efficiency, and technological innovation [19], this review will provide a comprehensive and up-to-date summary for clinicians and researchers. Additionally, it will explore emerging technologies, highlight the limitations of current studies, and identify specific directions for future research. This effort will ultimately contribute to the optimization of digital implantology and help guide clinical practice toward more predictable and patient-centered outcomes.

Materials and Methods

Search Strategy

A comprehensive literature search was conducted in PubMed, Scopus, Web of Science (Core Collection), and the Cochrane Library to identify studies comparing navigated (dynamic) and guided (static) implant surgery. The search was restricted to publications from January 2020 to August 2025. Because this is a narrative comparative review, we did not apply PRISMA or pool effect sizes; instead, we performed a structured qualitative synthesis of head-to-head studies. Both controlled vocabulary (such as MeSH terms) and free-text keywords were used, combining terms related to dental implants, navigated surgery, and guided surgery. Boolean operators were applied to ensure that only studies addressing both techniques were retrieved. The exact database-specific search strategies are summarized in Table 1 and will be provided as supplementary material for reproducibility.

Eligibility Criteria

Studies were considered eligible if they investigated human patients undergoing dental implant placement and directly compared navigated (dynamic) surgery with guided (static) surgery. Eligible studies were required to assess at least one clinically relevant outcome, including implant placement accuracy, implant survival, surgical time, complication rates, or clinician- and patient-reported satisfaction. Randomized controlled trials, prospective and retrospective cohort studies, case–control studies, and systematic reviews or meta-analyses were included. Studies were excluded if they were in vitro or animal investigations, single-technique evaluations without a comparative arm, narrative reviews, case reports, conference abstracts, or non-English publications.

Study Selection

All retrieved references were imported into EndNote 2025 (Clarivate Analytics) for management. The initial search identified 130 records. Duplicate records [47] were automatically detected and manually verified before removal, leaving 83 unique studies. These were screened by title and abstract according to the eligibility criteria, after which 72 studies were excluded for not meeting the inclusion requirements. The remaining eleven studies were reviewed in full text and subsequently deemed eligible for inclusion in the qualitative synthesis. Counts are reported for transparency; as a narrative review, no formal risk-of-bias scoring or meta-analysis was conducted.

Data Extraction

Data from the included studies were systematically extracted using a structured table. Extracted variables included the author and year of publication, country, study design, sample size, navigation system applied, guided approach employed, primary outcomes assessed, and principal findings. Study-level strengths and limitations were summarized qualitatively. Data extraction was performed independently by two reviewers, and any disagreements were resolved through discussion until consensus was achieved.

Table 1. The search strategies employed for each database.

Author (Year)	*Country*	*Study Design*	*Sample Size (Patients/Implants)*	*Intervention 1 (Dynamic Navigation)*	*Intervention 2 (Static Guide)*	*Outcomes Measured*	*Key Findings*
Carrico et al. (2024)	*USA & Slovenia*	*In vitro prospective randomized pilot study*	*4 senior dental students (novice operators); 40 implants placed (10 models/jaw per operator)*	*Navident (ClaroNav, Ontario, Canada); real-time tracking with fiducial markers and stereoscopic camera*	*CAD/CAM designed and 3D-printed surgical guides (3Shape Implant Studio, Formlabs resin, Zimmer Biomet sleeves)*	*Surgical time, horizontal entry deviation, apical vertical deviation, 3D apex deviation, angular deviation (planned vs placed implants using CBCT superimposition)*	*Guided implant placement did not significantly benefit or hinder freehand skills. Marginal improvements were seen in 3D apex deviation (0.89 mm) and angular deviation (3.74°), but differences were not statistically significant. Freehand skills slightly improved after guided training, suggesting neuroplastic adaptation and transfer of motor skills.*

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Author (Year)	Country	Study Design	Sample Size (Patients/Implants)	Intervention 1 (Dynamic Navigation)	Intervention 2 (Static Guide)	Outcomes Measured	Key Findings
Carrico et al. (2024)	USA & Slovenia	In vitro prospective randomized pilot study	4 senior dental students (novice operators); 40 implants placed (10 models/jaw per operator)	Navident (ClaroNav, Ontario, Canada); real-time tracking with fiducial markers and stereoscopic camera	CAD/CAM designed and 3D-printed surgical guides (3Shape Implant Studio, Formlabs resin, Zimmer Biomet sleeves)	Surgical time, horizontal entry deviation, apical vertical deviation, 3D apex deviation, angular deviation (planned vs placed implants using CBCT superimposition)	Guided implant placement did not significantly benefit or hinder freehand skills. Marginal improvements were seen in 3D apex deviation (0.89 mm) and angular deviation (3.74°), but differences were not statistically significant. Freehand skills slightly improved after guided training, suggesting neuroplastic adaptation and transfer of motor skills.
Khaohoen et al. (2024)	Thailand	Systematic review and meta-analysis of clinical trials	67 studies; 5,673 implants (53 static: 4,504; 15 dynamic: 1,125; 2 robotic: 44)	Dynamic CAIS (optical/mechanical real-time tracking; examples: Navident®, ImplaNav®, Dcarer®)	Static CAIS (CAD/CAM surgical templates, tooth/mucosa/bone-supported; fully, partial, or pilot protocols)	Coronal, apical, and angular deviations (accuracy vs. virtual plan); subgroup analysis by protocol, arch type, and flap technique	Overall mean deviations: coronal 1.11 mm, apical 1.40 mm, angular 3.51°. Robotic systems showed the best accuracy (coronal 0.81 mm, apical 0.77 mm, angular 1.71°), followed by dynamic (1.18 mm, 1.36 mm, 3.51°) and static (1.11 mm, 1.44 mm, 3.58°). No significant differences between arch type or flap technique in dynamic systems. Fully guided static protocols were significantly more accurate than pilot-guided but not significantly different from partially guided. Fully guided remains gold standard.
Ochandiano et al. (2022)	Spain	Prospective clinical study	11 patients; 56 implants	Intraoperative infrared optical navigation with optical tracking (dCAIS); later combined with rigid 3D-printed guides for registration stability	Tooth-supported 3D-printed acrylic resin guides (sCAIS), used alone or in combination with dynamic navigation	Accuracy (coronal, apical, angular deviation between planned and placed implants), implant osseointegration, prosthetic outcomes	Dynamic navigation alone had lower accuracy due to registration instability. Combining static guide + dynamic navigation provided highest accuracy (1–1.5 mm deviation at insertion point). Static alone had better apical accuracy. AR was useful for intraoperative verification but not reliable enough for guidance. Overall osseointegration rate was 98%, and all patients achieved fixed screw-retained prosthesis.
Parekar et al. (2024)	India	Prospective randomized clinical trial	20 patients; 40 implants (20 DN, 20 SG)	Navident (ClaroNav, Canada); real-time navigation with calibration and EvaluNav CBCT merging	CAD/CAM designed surgical guides (3Shape, DIO PROBO 3D printed resin)	Mesiodistal displacement, bucco-lingual displacement, apico-coronal displacement, mesiodistal angulation, surgical time, operator ease-of-use (Likert scale)	DN showed significantly greater accuracy in mesiodistal displacement and angulation ($p < 0.005$) for both implants compared to SG. No significant differences in apico-coronal or bucco-lingual displacement. Surgical time was shorter for SG (30 ± 4.5 min) vs DN (60.7 ± 10.1 min). Operators reported higher comfort and ease with SG, while DN required greater hand-eye coordination and was more restrictive. Both systems improved precision compared to freehand, but each has trade-offs.
Shi et al. (2025)	China	Single-center randomized controlled clinical trial (3-arm: RS, DN, SG)	45 patients (15 per group); single-tooth premolar/molar implants	DCARER Medical Technology system; binocular stereo-vision–based navigation	3D-printed surgical guides (Pro95; Sprintray) designed in 3Shape Implant Studio	Primary: positional accuracy (platform, apex, angular deviations). Secondary: surgical time, adverse events, wound healing (blood flow, oxygen saturation), patient-reported outcomes (OHIP-14, VAS), surgeon assessment	RS achieved near-zero systematic error (platform −0.1 mm, apex −0.1 mm, high accuracy). DN and SG showed centrifugal error patterns. Surgical time was shortest with SG (7.4 ± 1.8 min) vs DN (14.4 ± 2.8 min) and RS (21 ± 5.5 min). SG patients reported better oral health–related QoL at day 3; DN was easiest for surgeon access. Healing and patient satisfaction were comparable among groups. All 3 approaches were clinically safe and effective, each with trade-offs.

Author (Year)	Country	Study Design	Sample Size (Patients/Implants)	Intervention 1 (Dynamic Navigation)	Intervention 2 (Static Guide)	Outcomes Measured	Key Findings
Wang et al. (2021)	China	Systematic review and meta-analysis of clinical studies	8 studies included; 32–478 patients per study; 40–714 implants per study	Dynamic navigation systems (e.g., Navident, IRIS-100, DHC-DI3E, CAIS protocols)	Static computer-assisted implant guides (tooth-supported, mucosa-supported, etc.)	Accuracy of implant placement: platform deviation, apical deviation, angular deviation	Dynamic navigation significantly improved accuracy compared to freehand. No significant difference between dynamic navigation and static guidance.
Yin et al. (2025)	China	Meta-analysis of randomized controlled trials (RCTs) and controlled clinical trials (CCTs)	4 studies included; sample sizes: 20–54 patients; implants: 18–57 per study	Dynamic computer-assisted implant surgery (dCAIS) systems (varied; e.g., coDiagnostiX, BLT Straumann, Nobel Active, Navident, etc.)	Static computer-assisted implant surgery (sCAIS) using surgical guide plates	Accuracy: deviation at implant platform (top), apex, and angular deviation	No significant difference between dynamic and static navigation in coronal or apical deviation. Dynamic navigation showed significantly smaller angular deviation compared to static guides. Both methods provided clinically acceptable accuracy in the esthetic zone.
Yotpibulwong et al. (2023)	Thailand & Sweden	Randomized controlled trial	120 patients; 120 implants (30 per group: Static + Dynamic [SD], Static [S], Dynamic [D], Freehand [FH])	Dynamic navigation using IRIS-100 software (EPED Inc., Taiwan)	Tooth-supported stereolithographic surgical guides (coDiagnostiX 9.7, Straumann CARES P10+)	Accuracy: 3D deviation at platform, apex, and angle; directional deviation at platform/apex	No significant difference between dynamic and static navigation in coronal or apical deviation. Dynamic navigation showed significantly smaller angular deviation compared to static guides. Both methods provided clinically acceptable accuracy in the esthetic zone.
Younis et al. (2024)	China	Prospective clinical study (randomized allocation to DN, SG, or freehand)	65 patients; 94 implants (34 DN, 30 SG, 30 freehand)	DCARER system (Suzhou Digital-health Care Co. Ltd., China) using infrared optical tracking and fiducial markers	Tooth-supported stereolithographic (SLA) surgical guides designed in 3Shape Implant Studio, printed with Envisiontec Perfactory® 4 DDP4	Global coronal/platform deviation, global apical deviation, angular deviation, lateral deviation (platform/apical), depth deviation (platform/apical)	Both DN and SG significantly more accurate than freehand in all parameters except depth deviation. SG showed lowest angular deviation (2.52°), while DN had slightly higher angular deviation (3.66°). No significant differences between DN and SG except angular deviation. Both methods clinically acceptable; DN offers flexibility, SG more straightforward.
Yu et al. (2023)	China	Systematic review & meta-analysis of clinical studies	1076 patients; 2025 implants (1526 dynamic navigation, 220 static guide, 279 freehand)	Dynamic computer-assisted implant surgery (dCAIS) with six navigation systems: DCarer, Navident, IRIS-100, X-Guide, AqNavi, ImplaNav	Static computer-assisted implant surgery (sCAIS) with surgical templates (tooth-supported or mini-implant supported; manufactured by PolyJet, MultiJet, DLP, or SLA methods)	Global platform deviation, global apex deviation, angular deviation	Dynamic navigation showed significantly lower angular deviation than static guides and freehand. It also had significantly lower global platform and apex deviations than freehand. Overall, dynamic navigation was more accurate than both static guidance and freehand, though heterogeneity and learning curve issues remain.
Zhang et al. (2025)	China	Retrospective comparative clinical study	75 patients; 96 implants (32 DN, 34 SG, 30 freehand)	IRIS-100 dynamic navigation system (EPED, Taiwan) with thermoplastic bite plate registration	Tooth-supported CAD/CAM surgical guides (3Shape, printed with Projet 3500 3D Systems)	Neck, apical, depth, and angular deviations; distance from implant apex to inferior alveolar nerve; residual bone utilization rate; marginal bone loss (MBL); peri-implant gingival health (PD, SBI, PLI); implant success rate	DN had significantly smaller apical and angular deviations than SG and freehand. DN achieved greater implant depth and higher residual bone utilization. Distance to nerve was smallest in DN group, enhancing safety. No significant differences in marginal bone loss or peri-implant gingival health across groups. Implant success rate was 100% in all groups. DN provided superior precision and nerve safety, recommended for posterior mandible flapless cases.

DOI:

Results

A total of 11 studies, published between 2021 and 2025, were included in this review. These comprised four systematic reviews and meta-analyses, three randomized controlled trials, two prospective clinical studies, one retrospective comparative study, and one in vitro pilot study. Collectively, the studies assessed more than 7,500 implants across diverse clinical and experimental settings, comparing dynamic navigation (DN), static guidance (SG), hybrid protocols, and freehand techniques. Supplementary Table S1 summarizes the design, sample size, techniques compared, primary outcomes, one-line key findings, and qualitative quality notes for each included study.

Accuracy outcomes

Accuracy was consistently identified as the primary outcome across studies. Meta-analyses provided pooled deviations of approximately 1.1 mm at the coronal level, 1.4 mm at the apex, and 3.5° in angular deviation [17,20,21]. These reviews indicated no significant differences in coronal or apical deviations between DN and SG, although DN frequently achieved lower angular deviations. Yin et al. [22] reported DN systems had significantly smaller angular errors than SG, while both techniques demonstrated clinically acceptable deviations in esthetic zones. Clinical trials supported these findings. Parekar et al. [23] reported DN had significantly superior accuracy in mesiodistal angulation, while SG performed similarly or slightly better in coronal and apical control. Younis et al. [24] showed SG achieved the lowest angular deviation (2.52°), though DN remained comparable (3.66°). Zhang et al. [25] further demonstrated DN reduced apical and angular deviations relative to both SG and freehand, improving safety margins around the inferior alveolar nerve. Hybrid protocols provided the most precise outcomes. Ochandiano et al. [26] reported that combining DN with SG improved registration stability and reduced deviations to 1–1.5 mm at the insertion point. Yotpibulwong et al. [27] confirmed this, showing that static + dynamic navigation achieved the highest accuracy overall (0.62 mm platform, 0.75 mm apex, 1.24° angle), significantly outperforming either technique alone.

Surgical time and efficiency

Surgical efficiency consistently favored SG across clinical studies. Parekar et al. [23] reported mean surgical times of 30 minutes for SG compared with 61 minutes for DN. Shi et al. [28] similarly observed the shortest surgical times with SG (7.4 minutes), followed by DN (14.4 minutes) and robotic navigation (21 minutes). The longer operative times for DN were attributed to preoperative calibration, intraoperative registration, and increased demands on operator hand–eye coordination.

Operator experience and learning curve

Operator-related findings highlighted clear differences in usability. Carrico et al. [29] demonstrated that both DN and SG training improved freehand performance over time, suggesting a neuroplastic transfer of motor skills. Novice operators consistently rated SG as easier and more comfortable to use [23], while DN required greater psychomotor coordination and was perceived as more restrictive. Nonetheless, DN was valued for its intraoperative flexibility and real-time visualization, which enhanced surgical control in anatomically complex scenarios.

Patient-related outcomes

Few studies assessed patient-centered outcomes. Shi et al. [28] reported that SG patients had better oral health–related quality of life scores on the third postoperative day, although long-term wound healing, oxygenation, and satisfaction were comparable across DN, SG, and robotic approaches. Ochandiano et al. [26] reported successful prosthetic rehabilitation in all patients, with an overall 98% osseointegration rate across groups, confirming reliable outcomes regardless of navigation method.

Safety outcomes

Safety parameters were investigated in several studies. Zhang et al. [25] showed DN achieved greater depth control, minimized apical deviations, and maintained smaller distances to the inferior alveolar nerve compared with SG and freehand, enhancing safety in flapless posterior mandibular cases. DN also improved residual bone utilization. Importantly, marginal bone loss, peri-implant gingival indices, and implant survival rates did not differ significantly between DN and SG, with all groups reporting 100% short-term success.

Discussion

This review compared navigated surgery (NS) and guided surgery (GS) for dental implant placement, highlighting their respective advantages, limitations, and clinical relevance. While both approaches demonstrate a clinically acceptable level of accuracy, their differing workflows and implications significantly influence clinical decision-making. Meta-analyses and clinical studies confirm that while both methods achieve coronal and apical deviations within clinically acceptable limits, NS generally provides superior angular precision, whereas GS offers shorter operative times and workflow efficiency [17,20,21]. Both navigated and guided surgery techniques provide deviations that are within safe clinical limits, which supports their widespread use in modern implant dentistry [30]. However, our review highlights a key distinction: NS provides superior control over angular deviation and depth precision, a finding supported by multiple studies [22,23,25], although some reports show GS can achieve comparable angular outcomes in selected cases [24].

This offers a safety advantage in areas with complex anatomy, such as the posterior mandible or the esthetic zone, and allows for real-time adjustments if the intraoperative findings differ from the initial surgical plan [18,31]. This adaptability during surgery is a unique advantage of navigation, particularly when intraoperative findings deviate from the preoperative plan. In contrast, GS offers a more efficient workflow. Clinical studies confirm that GS significantly reduces operative time compared with NS [23,28], which, along with patient comfort, makes it particularly beneficial for routine cases [32,33]. The main trade-off is its lack of intraoperative flexibility, as static templates cannot be modified to account for unexpected anatomical findings. Another key distinction is the operator learning curve. GS is often considered more intuitive for new clinicians due to its structured and simplified workflow [15]. Although NS requires greater hand–eye coordination, studies show it enhances accuracy regardless of the surgeon's experience [15] and improves transferable surgical skills during training [14,29], while also providing valuable real-time educational feedback. Although accuracy metrics are the primary focus of the literature, fewer studies have evaluated outcomes directly relevant to patients, such as esthetics, postoperative morbidity, or long-term implant survival. The available evidence suggests that both NS and GS achieve high rates of osseointegration and success, with minimal differences in patient satisfaction [34]. Shi et al. [28] reported that GS patients experienced better short-term oral health–related quality of life, while hybrid protocols demonstrated superior placement accuracy and prosthetic outcomes, with osseointegration rates above 95–98% [26,27]. However, there is still insufficient evidence on long-term comparative outcomes. This gap highlights the need for research to move beyond technical deviation measurements and include quality of life and esthetic indices.

Studies indicate that NS provides superior depth control and reduces risk of nerve injury in flapless posterior mandibular cases [25], although survival rates and bone stability remain similarly high for both NS and GS [26,28]. The primary strengths of both NS and GS are their reproducibility and ability to reduce the risks associated with freehand implant placement [35]. However, inconsistencies across studies, including differences in navigation systems, guide support types, and operator training, limit the ability to generalize the pooled outcomes. Additionally, cost-effectiveness analyses remain rare, despite the substantial financial cost of NS systems compared to GS. Emerging technologies, such as augmented reality, robotics, and artificial intelligence, show great promise for balancing efficiency and adaptability, potentially exceeding the accuracy of current systems. Future research should focus on long-term randomized controlled trials that evaluate not only survival and deviation metrics but also patient-reported satisfaction, cost-benefit ratios, and esthetic outcomes. Integrating these different perspectives will help guide clinicians toward a more evidence-based and patient-centered approach to the use of digital surgical technologies.

Conclusion

Based on a comparison of navigated and guided surgery, both methods are reliable and accurate, each with a specific clinical role. Guided surgery offers efficiency for routine cases, while navigated surgery provides greater adaptability and precision for complex procedures. The two techniques should be viewed as complementary tools in modern implant dentistry. Future research is needed to evaluate patient-centered outcomes and cost-effectiveness to guide clinical practice better.

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Conflict of Interest

There is no conflict of interest to declare.

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