

Comparative Evaluation of Vestibular Incision Subperiosteal Tunnel Access (VISTA) Technique with other Tunneling Techniques: Protocol for a Systematic Review and Meta-analysis

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ABSTRACT

Introduction: Gingival recession is defined as the displacement of the gingival margin apical to the Cementoenamel Junction (CEJ). The aim is to achieve complete root coverage. The increasing demand for aesthetics by patients has led dentists to adopt newer and more novel techniques. Since Allen first introduced the tunneling technique in 1994, several procedural adjustments have been suggested. The “Vestibular Incision Subperiosteal-Periosteal Tunnel Access (VISTA)” technique was introduced by Zadeh HH and offers the benefit of being minimally invasive.

Need for the study: This systematic review aims to guide clinicians in selecting the best possible root coverage procedure for better patient-centered outcomes.

Aim: The aim is to compare the “VISTA technique” with other tunneling techniques in the treatment of multiple gingival recession defects.

Materials and Methods: Up until December 2023, the authors will search PubMed, the Cochrane Library, and Embase without any language constraints. Additionally, reviewers will hand-

search and examine the bibliographies of relevant publications, search trial registries for active trials, and look for potentially relevant research. The keywords to be used for the search include VISTA technique, tunneling technique, root coverage procedure, and multiple gingival recession. Randomised Controlled Trials (RCTs) using an open or blinded assessment of outcomes will be included. Full journal publications will also be included. Exclusions will be made for brief abstracts (typically meeting reports), non randomised studies, research on experimental pain, studies based on animal models, and observational studies. The eligibility of each study will be independently determined by three review authors (SS, PD, RO). They will then extract the data and independently assess the Risk of Bias (RoB) for each study using the established Cochrane methodology. The evidence will be assessed using Grading of Recommendations Assessment, Development and Evaluation (GRADE), and a summary of findings will be tabulated. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines will be followed for present review.

Keywords: Multiple gingival recession defects, Minimally invasive techniques, Periodontal surgery, Root coverage, Tunneling techniques, Vestibular incision subperiosteal tunnel access

INTRODUCTION

Gingival recession is defined as the displacement of the gingival margin apical to the CEJ. It can be localised or generalised, and can involve single or multiple areas. The initial treatment for recession involves addressing all aetiological factors, followed by surgical management [1,2]. Over the past few decades, various surgical techniques have been documented for Miller's Class-I and II GR defects, with the aim of achieving complete root coverage [2]. The increasing demand for aesthetic improvements by patients has led dentists to adopt newer and more innovative treatment techniques. Periodontal plastic surgery presents a significant challenge due to its technical sensitivity and the wide range of procedures and modifications involved [3]. One such procedure is the tunneling technique, which was first introduced by Allen AL in 1994 and has since undergone several procedural adjustments [4]. The “VISTA” technique, introduced by Zadeh HH in 2011, offers the advantage of being minimally invasive [5]. VISTA has also been tested in combination with various grafting materials, yielding promising results, and it provides good access and visualisation of bone dehiscence and root morphology. The incision is positioned away from the defect area, reducing the risk of trauma to the delicate marginal gingiva. Furthermore, it improves wound healing and simplifies the tunneling process [2,4,6,7].

The present review highlights the importance of introducing minimally invasive surgical techniques to achieve better aesthetic outcomes, given the increasing aesthetic demands of patients. The systematic review aims to guide clinicians in selecting the most suitable root coverage procedure for improved patient-centered outcomes.

METHODOLOGY

Search methods for inclusion of studies: The authors will search the “PubMed” database according to the study plan. Language restrictions will not be imposed, and Medical Subject Headings (MeSH) or their equivalents, along with keywords, will be used as search terms. The meta-register of controlled trials will also be searched using keywords such as VISTA technique, tunneling technique, root coverage procedure, and multiple gingival recession.

Additionally, the authors will review the reference lists of included articles, retrieve publications for further research, and conduct citation searches on important articles. Electronic searches will include Medline (from inception to date), Central (from inception to date), and ClinicalTrials.gov. Other searches will involve the bibliographies of relevant references, manual searches of journals, books, and contacting experts in the respective field.

The PICO statement for the review is as follows:

P=Patients aged 18 years or older

I=VISTA technique

C=Tunneling techniques

O=Patient-centred outcomes

Consideration for review studies:

Types of study:

The authors intend to include Randomised Controlled Trials (RCTs) that examine outcomes using either a blinded or open method. Full journal publications will be included. Exclusions will be made for brief abstracts, such as meeting reports, non randomised studies, studies based on animal models, and observational studies.

Inclusion criteria for participants: Patients clinically diagnosed with multiple gingival recession abnormalities, regardless of gender or ethnicity, and who are systemically healthy (18 years or older) will be included.

Outcomes to be Measured

Mean Complete Root Coverage achieved (CRC): The measurement of the soft tissue margin at the level of the CEJ, absence of bleeding on probing, a sulcus depth of 2 mm or less, and the presence of clinical attachment to the root [8].

Mean Relative Clinical Attachment Loss (RCAL): Measured from the CEJ to the base of the pocket using a fixed reference point [8].

Mean Width of Keratinised Gingiva (WKG): Measured from the gingival margin to the mucogingival junction [8].

Mean Gingival Thickness (GT): Measurement of the thickness of the free gingiva [8].

Analysis and Collection of Data

Three review authors (SS, PD, RO) will independently scan the search results using the Rayyan online screening tool to select articles. The eligibility of each study will be determined based on a brief review of the abstracts [9]. Studies that do not clearly meet the inclusion criteria will be excluded. In cases of disagreement or conflicts, the final decision will be made by the third author (PB). There will be no language restrictions on the selected studies. A PRISMA flow chart, as outlined in Part 2, Section 11.2.1 of the Cochrane Handbook for systematic reviews of interventions, will be included in the complete review to provide an overview of the status of all identified studies [10,11]. Studies will be included in present review regardless of whether outcome data are reported [12].

Extracting of Data (Coding and Selection)

Using a predefined data extraction form, the three reviewers (SS, PD, and RO) will extract data from the included studies and create a 'Characteristics of Studies Table'. The data will include information about the study's nature, participant details, intervention information, and reported results. In cases of disagreement in the assessment of the Risk Of Bias (RoB), the second reviewer (PD) will help resolve any discrepancies.

Risk of Bias (RoB) (Quality) Assessment

Three reviewers (SS, PD, RO) will independently assess the RoB for each included study using the Cochrane domain-based, two-part tool described in Chapter 8 of the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011) [13]. The RoB assessment will be conducted in the following areas: generation of sequence, blinding of participants and personnel, incomplete outcome data, concealment of allocation, blinding of outcome assessment, reporting of selective outcome, and other bias.

Data Synthesis Strategy

The authors will conduct a meta-analysis only when the participants, interventions, comparisons, and results are sufficiently comparable. The Cochrane Collaboration's RevMan 2014 statistical package will be used for the meta-analysis. If heterogeneity is detected, subgroup analysis will be conducted to identify the sources of heterogeneity and investigate the underlying cause. In cases of statistical heterogeneity, a random-effects model will be employed. If a meta-analysis is deemed unnecessary, a qualitative summary of the relevant research will be provided instead of combining the findings from all included studies.

Subgroups or Subsets Analysis

Not applicable

Issues Regarding unit of Analysis

The individual participants in parallel-group RCTs will be the unit of analysis. Cross-over trials will be incorporated into the meta-analysis using Elbourne's method [14]. Measures from both the experimental intervention periods and control intervention periods will be analysed and included in such trials.

Dealing with Missing Data

Authors will conduct an intention-to-treat analysis based on the number of available studies. If the published data is insufficient, inaccurate, or not in accordance with the protocols of the RCTs, we will seek further clarification from the authors.

Reporting Bias Assessment

If, there are ten or more included studies, a funnel plot test will be conducted to assess for potential asymmetry and evaluate any indications of reporting bias.

Synthesis of Data

Authors will only conduct a meta-analysis if it is determined that the participants, interventions, comparisons, and results of the included studies are sufficiently similar to generate a conclusion with therapeutic significance.

Heterogeneity Assessment

The clinical heterogeneity will be assessed using the chi-square test, with a p-value of less than 0.10 considered statistically significant [15]. The I^2 statistic will be used to measure the heterogeneity in the results of the included studies [15]. If, statistical heterogeneity is identified, with an I^2 value equal to or greater than 50%, potential explanations will be investigated through predetermined subgroup analysis. A random-effects model will be used and the results will be reported accordingly [16].

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