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INPLASY

Variations in the repositioning guides used in maxillary le fort 1 osteotomy: A scoping review protocol

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ADMINISTRATIVE INFORMATION

Support - Nil.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 February 2025 and was last updated on 23 February 2025.

INTRODUCTION

Review question / Objective To review the various design of surgical guides used to reposition the maxilla after a maxillary le fort 1 osteotomy. The objective of this scoping review is to systematically map the accessible and relevant research literature to answer the research question, that is d to evaluate the various design of surgical guides used to reposition the maxilla after a le fort 1 osteotomy, and how the accuracy may vary between each design. Through this process, we will also produce an overview, or even a classification, of the various designs of guides currently used. The long term goal is to streamline the design process of guides used in this surgery.

Background With the advent of digital technology in healthcare services, more and more surgeons are apply these technology in the care of their patients.
One of such methods would be the use of surgical guides in orthognathic surgery. Conventionally, orthognathic surgery is performed "free-hand" whereby the cuts / osteotomies, repositioning of the bone and fixation of the bone is done manually. These are performed using local landmarks intra-operatively, allowing room for inaccuracies. The use of digital technology has allowed guides to be designed and printed prior to surgeries. Therefore, there will be almost no need for any intra-operative measurements or assessment. The entire surgery could be performed "guided". This reduce the odds of inaccuracies. Furthermore, the time could be saved from all the measurements and etc. However, there is a myriad of designs of guides. Each design promises different benefits but yet may not always be validated.

Rationale The purpose of this study is to evaluate all existing designs in repositioning guides used for maxillary le fort 1 osteotomies, in relation to their accuracy measure. Additionally, this study will seek to classify the various designs. This study is important because the digital technology boom has led to an immense number of publications in

digitally designed and printed guides used in this surgery. All the guides promises a higher degree of accuracy than the conventional method, or even compared to other designs. However, these claims may not be validated.

METHODS

Strategy of data synthesis We will search Pubmed, Embase and Cochrane with the following search strategies.
#1: ((surgical guide*) OR (cutting guide*) OR (repositioning guide*) OR (splintless) OR (custom guide*) OR (Custom plates*) OR (osteotomy guide*) OR (3D printed) OR (3D printing) OR (Patient-specific) OR (patient specific) OR (surgical template*) OR (cutting template*) OR (positioning template*))
#2: (Orthognathic) OR (Le fort 1 osteotom*) OR (le fort osteotom*) OR (Maxillary osteotom*) OR (Minimally invasive orthognathic) OR (Minimally-invasive orthognathic) OR (minimally-invasive le fort*) OR (minimally invasive le fort*) OR (MIOS)
#3: (ACCURACY) OR (PRECISION) OR (RELIABILITY) OR (TRUENESS)
#4: #1 AND #2 AND #3.

Eligibility criteria P: Human patients who had maxillary le fort 1 osteotomy performed and fixated using digitally designed and printed guides.
C: Studies performed in humans, with any form of accuracy measures. This includes accuracy, infection, ease of use, bleeding. The articles must also be available in English.
C: Performance of various digitally designed and printed guides used to repositioning the maxilla.

Source of evidence screening and selection Using an inclusion and exclusion criteria list. 2 independent reviewer will screen the title and abstract. A 3rd reviewer will be involved when there is no consensus. The same is applied during the full length article review. This is following the PRISMA-Scr guidelines.

Data management We will be following the recommendations of Arksey and O'malley scoping review methodology. A data extraction form will first be generated on a spreadsheet. The information collected will include main information of the publication (Author, year, country, objectives, methods, findings). The review on data extraction will be carried out by 2 independent authors. The 3rd reviewer will be involved if there is any disagreement.

Reporting results / Analysis of the evidence Quality assessment and risk of bias analysis will first be applied using the ROBS2, ROBS tool or cochrane collaborations tool, JBI review for case report or case series.
Following which the data will be synthesized using the methodology recommended by Arksey and O'Malley (2005). The PRISMA-SCR will be used for the reporting of this study. Subgroups will be identified and classified accordingly. If permitted, sensitivity analysis will be performed.

Presentation of the results We will use figures to illustrate the various designs of the guides. Secondly, we will use a flowchart to categorise the various designs. The general data will be presented using tables.

Language restriction English only.

Country(ies) involved Singapore.

Other relevant information Nil

Keywords Cutting Guide; Orthognathic; Le fort 1; Repositioning Guide; Surgical Guide.

Dissemination plans The findings will be published in peer-reviewed journals and/or presented at scientific conferences.

Contributions of each author
Author 1 - cheryl lee - Prepares and develop the protocol. Will also be involved in the selection, data extraction and manuscript.
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