International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Artificial intelligence application in case of mandibular third molar impaction: Systematic review of literature

INPLASY202460081
doi: 10.37766/inplasy2024.6.0081
Received: 21 June 2024
Published: 21 June 2024

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ADMINISTRATIVE INFORMATION

Support - Department of diagnostic science at college of dentistry.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202460081

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 June 2024 and was last updated on 21 June 2024.

INTRODUCTION

Review question / Objective What is the application and use of AI in patients with third molar impaction? P: Patients with third molar impaction; I: AI; C: Comparison with other tools, if applicable; O: Uses and applicability of AI. This systematic review summarizes the evidence on the applicability of AI in impacted mandibular third molars.

Rationale Artificial intelligence (AI) refers to the application of machines and technology to perform tasks conventionally carried out by humans. This technology can learn and apply knowledge to perform specific tasks across various fields. AI techniques are being applied in medicine for disease diagnosis, prognostic assessment, and predictability. A recent systematic review demonstrated that AI can automatically detect coronary artery calcification, cerebral microhemorrhages, diabetic retinopathy, and breast or skin cancer. AI has been integrated into various aspects of dentistry, including the diagnosis and treatment of impacted mandibular third molars, i.e., predicting the difficulty of extraction of impacted mandibular third molars and providing valuable information to clinicians to determine the appropriate treatment approach. In addition to diagnostic and treatment planning, AI has been applied in postoperative management to predict postoperative complications and consequences, such as facial swelling after extraction of the impacted mandibular third molars, thereby improving patient management and care.12 Nonetheless, the extent of AI application in impacted third molars remains unclear. Therefore, this systematic review summarizes the evidence on the applicability of AI in impacted mandibular third molars.

Condition being studied The application of artificial intelligen in mandibular third molar impaction.

METHODS

Search strategy PubMed ((impacted tooth) OR (mandibular third molar impaction)) AND (artificial intelligence). Scopus TITLE-ABS-KEY (artificial AND intelligence) AND TITLE-ABS-KEY (impacted AND tooth) OR TITLE-ABS-KEY (mandibular third molar impaction). Google scholar Artificial intelligence AND impacted tooth OR mandibular third molar impaction.

Participant or population Patients with mandibular third molar impaction.

Intervention Artificial intelligence approaches.

Comparator Comparison with different diagnostic modalities such as artificial intelligence adhered imaging tools such as panoramic radiography and cone beam compute tomography.

Study designs to be included Artificial intelligence applicability.

Eligibility criteria Criteria the inclusion criteria were as follows: Studies reported in English and Spanish; those describing AI; those conducted to investigate the mandibular third molar; original studies, including randomized clinical trials. Conversely, reviews, studies investigating other dental aspects, technical reports, and studies reported in other languages were excluded from this review.

Information sources PubMed, Scopus and Google scholar.

Main outcome(s) A standardized form will be utilized for data extraction, formalization essential details such as Year and author, Aims of the study, Sample, study design, Imaging tool, AI application method, Comparison if applicable and Results.

Data management Mendeley reference manager and RefWorks®.

Quality assessment / Risk of bias analysis The authors independently used the tool Scottish Intercollegiate Guidelines Network (SIGN) to evaluate bias in the included studies. This method of evaluating the level of scientific evidence simplified the assessment of risk of bias and determined the quality of the articles in the current study.

Strategy of data synthesis We compared the outcome of each included study after the data extracted.

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Country(ies) involved Saudi Arabia.

Keywords Impacted tooth; mandibular third molar, artificial intelligence; panoramic radiography; cone beam computed tomography.

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