INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Intraoperative strategies in identification and functional protection of parathyroid gland for patients with thyroidectomy: A network meta-analysis

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Review question / Objective: To assess the roles of intraoperative visualization of parathyroid glands (IVPG) strategies including autofluorescence (AF), indocyanine green (ICG) fluorescence and carbon nanoparticles (CN) in identification and functional protection of parathyroid glands (PGs).

Condition being studied: The IVPG strategy is essential for intraoperative identification and functional protection of PGs in patients undergoing thyroid surgery. Recent studies have revealed that autofluorescence (AF), indocyanine green (ICG) fluorescence, and carbon nanoparticles (CN) contribute to reducing the incidence of postoperative hypocalcemia by improving PGs identification(6-8). However, different IVPGs have respective superiority and inferiority in clinical application. Thus, this network meta-analysis aimed to systematically analyze the significance of IVPG strategy in identifying PGs and protecting their function.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 November 2022 and was last updated on 21 November 2022 (registration number INPLASY2022110109).

INTRODUCTION

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METHODS

Search strategy: ("thyroid surgery" OR "thyroid operation" OR "thyroidectomy") AND ("indocyanine green" OR "near-infrared fluorescence" OR "autofluorescence" OR "carbonnanoparticles").

Participant or population: Patients who underwent thyroidectomy with or without central or lateral neck dissection due to benign or malignant thyroid disease, and AF, ICG or CN was used as an IVPG strategy.

Intervention: Intraoperative visualization of parathyroid glands strategy including autofluorescence (AF), indocyanine green (ICG) fluorescence, and carbon nanoparticles(CN).

Comparator: Intraoperative parathyroid glands idenfied with Naked eyes or comparised between intraoperative visualization of parathyroid glands strategy.

Study designs to be included: The prospective or retrospective control study protocol like randomized controlled trials (RCTs) or non-randomized studies (NRSs).

Eligibility criteria: The inclusion criteria of this study following: 1) patients who underwent thyroidectomy with or without central or lateral neck dissection due to benign or malignant thyroid disease; 2) AF, ICG or CN was used as an IVPG strategy; 3) a prospective or retrospective control study protocol; 4) the incidence of postoperative hypocalcemia, the rate of intraoperative PGs identification, auto-transplantation and inadvertent resection

were defined as outcomes of these studies. Studies were excluded based on the following criteria: 1) conference abstract, review, case report, animal experiment, commentary, discussion, letter and non-control studies; 2) parathyroidectomy while thyroidectomy in once surgery procedure; 3) incomplete key outcome of interest.

Information sources: PubMed, the Cochrane Central Register of Controlled Trials, CNKI, EMBASE, Web of Science and Google Scholar databases.

Main outcome(s): The incidence of postoperative hypocalcemia, the rate of intraoperative PGs identification, auto-transplantation and inadvertent resection.

Quality assessment / Risk of bias analysis: The Cochrane Collaboration tool for RCTs and the Newcastle-Ottawa Scale (NOS) for NRSs.

Strategy of data synthesis: A network meta-analysis based on the Bayesian network meta-analysis.

Subgroup analysis: Subgroup analysis was determined according to the results of the previous analysis.

Sensitivity analysis: Markov chain Monte Carlo simulations were performed to fit the random effect models.

Country(ies) involved: China.

Keywords: Autofluorescence, indocyanine green fluorescence, carbon nanoparticles, parathyroid glands, thyroid surgery.

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