INPLASY PROTOCOL

Corresponding author:
Jili Zhang

2062486650@qq.com

Author Affiliation:
The First Affiliated Hospital of Dalian Medical University

Review Stage at time of this submission: Preliminary searches.

Conflicts of interest: None.

Diagnostic accuracy of ultrasound superb microvascular imaging for parotid tumors：A protocol for systematic review and meta-analysis

Zhang, J[1]; Wu, J[2]; Hou, X[3].

Review question / Objective: This systematic review will determine the accuracy of superb microvascular imaging in the differential diagnosis between benign and malignant parotid tumors.

Condition being studied: Parotid tumors account for 80% of salivary gland tumors in clinical practice, of which 80–85% are benign tumors and 15–20% are malignant tumors. There are great differences in treatment and long-term prognosis between benign tumors and malignant tumors patients. Therefore, it is very important to diagnose benign and malignant parotid tumors. High frequency ultrasound can not only show the size, shape, and internal echo of parotid tumors, but also show the blood flow distribution. As a novel ultrasound technique, superb microvascular imaging can quickly, simply and noninvasively study the microvascular distribution in the tumor and evaluate the microvascular perfusion. The SMI adopts a multidimensional filter to eliminate only the clutter and to preserve low-velocity flow signals, whereas conventional Doppler systems use a single-dimension filter and, accordingly, can exhibit a loss of low-velocity flow signals that overlap with clutter . Studies suggested that superb microvascular imaging is helpful for the differentiation between benign and malignant parotid tumors.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 October 2020 and was last updated on 24 October 2020 (registration number INPLASY2020100093).

INTRODUCTION

Review question / Objective: This systematic review will determine the accuracy of superb microvascular imaging in the differential diagnosis between benign and malignant parotid tumors.

Condition being studied: Parotid tumors account for 80% of salivary gland tumors in clinical practice, of which 80–85% are benign tumors and 15–20% are malignant tumors. There are great differences in treatment and long-term prognosis between benign tumors and malignant tumors patients. Therefore, it is very important to diagnose benign and malignant parotid tumors. High frequency ultrasound can not only show the size, shape, and internal echo of parotid tumors, but also show the blood flow distribution. As a novel ultrasound technique, superb microvascular imaging can quickly, simply and noninvasively study the microvascular distribution in the tumor and evaluate the microvascular perfusion. The SMI adopts a multidimensional filter to eliminate only the clutter and to preserve low-velocity flow signals, whereas conventional Doppler systems use a single-dimension filter and, accordingly, can exhibit a loss of low-velocity flow signals that overlap with clutter . Studies suggested that superb microvascular imaging is helpful for the differentiation between benign and malignant parotid tumors.

METHODS

Participant or population: Parotid tumors patients.

Intervention: Superb microvascular imaging.

Comparator: Pathology.

Study designs to be included: High quality clinical cohort or case control studies.

Eligibility criteria: 1.1 Type of study. This study will only include high quality clinical cohort or case control studies. Type of patients. The patients should be those who had undergone parotid tumors. 1.2. Intervention and comparison. This study compares SMI with pathology for diagnosing parotid tumors. 1.3. Type of outcomes. The primary outcomes include sensitivity, specificity, positive and negative likelihood ratio, diagnostic odds ratio, and the area under the curve of the summary receiver operating characteristic.

Information sources: PubMed, Web of Science, Cochrane Library, and Chinese biomedical databases will be searched from their inceptions to the July 31, 2020, without language restrictions.

Main outcome(s): Its findings will provide helpful evidence for the accuracy of superb microvascular imaging in the differential diagnosis between benign and malignant parotid tumors.

Quality assessment / Risk of bias analysis: Methodological quality was independently assessed by 2 researchers based on the quality assessment of studies of diagnostic accuracy studies (QUADAS) tool. The QUADAS criteria included 14 assessment items. Each of these items was scored as "yes" (2), "no" (0), or "unclear" (1). The QUADAS score ranged from 0 to 28, and a score ≥22 indicated good quality. Any disagreements between 2 investigators will be solved through discussion or consultation by a 3rd investigator.

Strategy of data synthesis: Two authors will independently select the trials according to the inclusion criteria, and import into Endnote X9. Then remove duplicated or ineligible studies. Screen the titles, abstracts, and full texts of all literature to identify eligible studies. All essential data will be extracted using previously created data collection sheet by 2 independent authors. Discrepancies in data collection between 2 authors will be settled down through discussion with the help of another author. The following data will be extracted from each included research: the first authors surname, publication year, language of publication, study design, sample size, number of lesions, source of the subjects, instrument, "gold standard," and diagnostic accuracy.

Subgroup analysis: We also performed sub group and meta-regression analyses to investigate potential sources of heterogeneity. To evaluate the influence of single studies on the overall estimate, a

sensitivity analysis was performed. We conducted Beggs funnel plots and Eggers linear regression tests to investigate publication bias.

Sensibility analysis: The true positives, true negatives, false positives, and false negatives in the fourfold (2*2) tables were also collected. Methodological quality was independently assessed by 2 researchers based on the quality assessment of studies of diagnostic accuracy studies (QUADAS) tool. The QUADAS criteria included 14 assessment items. Each of these items was scored as "yes" (2), "no" (0), or "unclear" (1). The QUADAS score ranged from 0 to 28, and a score ≥22 indicated good quality. Any disagreements between 2 investigators will be solved through discussion or consultation by a 3rd investigator.

Country(ies) involved: China.

Keywords: parotid tumors, meta-analysis, superb microvascular imaging.

Contributions of each author:
Author 1 - Jili Zhang.
Author 2 - Jialing Wu.
Author 3 - Xiukun Hou.