

INPLASY PROTOCOL

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None declared.

INTRODUCTION

Review question / Objective: To determine
the utility of CEUS in the preoperative
differentiation between pleomorphic

Contrast-enhanced ultrasound in the differentiation between the most common benign parotid gland tumors: a systematic review and meta-analysis

Rogalska, M¹; Antkowiak, L²; Kasperczuk, A³; Scierski, W⁴.

Review question / Objective: To determine the utility of CEUS
in the preoperative differentiation between pleomorphic
adenomas (PAs) and Warthin's tumors (WTs) of the parotid
gland.

Condition being studied: Recently, contrast-enhanced
ultrasound (CEUS) has become a promising tool in
distinguishing benign from malignant parotid gland tumors.
However, its usefulness in differentiating various benign
parotid tumors has not been determined so far. The
preoperative differentiation of the most common parotid
gland tumors (PAs and WTs) remains crucial to select an
appropriate management strategy. Therefore, the purpose of
the present study was to systematically review the literature
to determine the utility of CEUS in the differentiation of PAs
and WTs of the parotid gland.

INPLASY registration number: This protocol was registered with
the International Platform of Registered Systematic Review and
Meta-Analysis Protocols (INPLASY) on 10 December 2022 and
was last updated on 10 December 2022 (registration number
INPLASY2022120042).

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METHODS

Participant or population: Patients with PAs or WTs of the parotid gland, who underwent preoperative CEUS imaging.

Intervention: The evaluation of PAs and WTs by means of CEUS (number of assessed benign parotid gland tumors [PAs/WTs], reference standard (histopathology), contrast agent (Sonovue), time considered for analysis following contrast administration, the region of interest (ROI) selection, tumor characteristics on CEUS images, and the assessed CEUS parameters).

Comparator: Not applicable.

Study designs to be included: Non-randomized prospective and retrospective studies.

Eligibility criteria: (1) Additional inclusion criteria: English-language full-text papers evaluating differential diagnosis of benign parotid tumors using CEUS. (2) Exclusion criteria: publications with an unrelated topic, conference papers, review articles, case reports, commentaries, technical notes, and letters to the editor.

Information sources: The PubMed, Embase, and Cochrane databases were searched by two authors independently for English-language full-text papers published from inception until July 21, 2022. Additionally, the reference lists in all preselected articles were screened for further relevant papers. Any discrepancies

between the researchers were discussed, until a consensus was reached.

Main outcome(s): To determine the presence of qualitative and quantitative CEUS characteristics, which significantly differ between PAs and WTs of the parotid gland.

Quality assessment / Risk of bias analysis: Two reviewers independently assessed the quality of the eligible studies (regarding their applicability and risk of bias) according to the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) tool. Any discrepancies between the reviewers were resolved through discussion until a consensus was reached.

Strategy of data synthesis: Since the studies included in the meta-analysis came from different centers and covered slightly different populations, the summary was performed by applying a random effect. As the end result, the mean value with a 95% confidence interval (CI) was chosen. Statistical heterogeneity in the studies was assessed using the I² statistics. For values above 50%, further analysis was performed to identify the source of the heterogeneity, allowing the inclusion of homogeneous studies only. The mean values were then compared between the groups (PA and WT) with a series of t-tests for the two means in order to determine the significance. Additionally, qualitative CEUS features of PAs and WTs available throughout the articles were compared using the Chi² test. Differences were considered significant at $p < 0.05$. The analysis was performed using Statistica 13.3 (StatSoft Polska, Krakow, Poland) and PQStat 1.8.4 (PQStat Software, Poznan, Poland) software.

Subgroup analysis: The evaluation of differences in various qualitative and quantitative CEUS-derived features between PAs and WTs of the parotid gland.

Sensitivity analysis: Not applicable.

Language restriction: English.

Country(ies) involved: Poland.

Keywords: ultrasonography; salivary gland; pleomorphic adenoma; Warthin's tumor; perfusion.

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