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SHEAR WAVE ELASTOGRAPHY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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In the present work, a new method combining surface nanocrystal *Shear Wave Elastography (SWE)* is a technique for discriminating benign and malignant tumors in patients suspected of breast cancer. The technique prevents unnecessary biopsy as it provides tissue rigidity data in qualitative and colored format through Shear Wave Elastography. The technique was applied as "Shear Wave Elastography" on August 4th 2015 based on Article 53 of Medical Service Act and Article 3 of the rules regarding New Health Technology Assessment.

Purpose: *Shear Wave Elastography (SWE)* is a technique for discriminating benign and malignant tumors in patients suspected of breast cancer. The technique prevents unnecessary biopsy as it provides tissue rigidity data in qualitative and colored format through Shear Wave Elastography. The safety and effectiveness of the technique were assessed.

Methods: The literature review for Shear Wave Elastography was done using 8 national databases including KoreaMed and several international databases including Ovid-MEDLINE, Ovid-EMBASE, and Cochrane Library. Using strategic search with such keywords as '{Breast.mp AND shear.mp AND (elastography/ OR elastography.mp OR elasticity imaging.mp OR sonoelastography.mp)}'; a total of 444 articles were collected. Articles were excluded in case of animal experiment, preclinical experiment, not original research (abstract, review, etc.), not published in Korean or in English, grey literature, case studies, research not based on patients suspected of benign or malignant breast cancer, research where Shear Wave Elastography was not performed, or research not exhibiting at least one appropriate medical outcome. After having applied the inclusion criteria to 254 articles (excluding 190 duplicated articles), 23 articles (all from international databases) were included in the final assessment. The subcommittee and two additional reviewers independently performed each step of the assessment including literature search, application of the inclusion criteria, evaluation of the article quality, and data extraction. The quality of the articles were evaluated using SIGN (Scottish Intercollegiate Guidelines Network), and the level of evidence and the grade of recommendation were carefully determined and documented based on the quality.

Results:

Safety: Shear Wave Elastography was assessed to be a technique with similar level of safety to the existing breast ultrasonography, as the technique is an in vitro test where shear wave ultrasound is emitted and received for scanning the lesions which is interpreted in quantitative terms.

Conclusion and Recommendation: Based on the current literature review, the subcommittee on Shear Wave Elastography

concluded as below: *Shear Wave Elastography (SWE)* is a safe and effective technique for discriminating benign and malignant tumors in patients suspected of breast cancer, which prevents unnecessary biopsy when used alongside the breast ultrasonography (Grade of Recommendation C). Based on Article 3 Section 6 of the rules regarding New Health Technology Assessment, and based on the report from the subcommittee, the New Health Technology Assessment Committee (April 1st, 2016) deliberated the applied technique as below: *Shear Wave Elastography (SWE)* is a safe and effective technique for discriminating benign and malignant tumors in patients suspected of breast cancer, which prevents unnecessary biopsy when used alongside the breast ultrasonography (Grade of Recommendation C).

Biography

Dr. Mo received her PhD degree from Inha University (2017), Korea. She has extensive knowledge of acute care nursing, as she has been a manager of two medicine inpatient wards, and has worked as a registered nurse on both a coronary care unit, and an operating room. She is currently working in National Health National Evidence-based Healthcare Collaborating Agency, as an independent research institution for health technology assessment. Dr. Mo has published over 50 articles, 30 edited books, and presented many research at National and International Conferences. She conducts research and writes about evidence-based research (medicine, nursing, health) and cognitive health care.

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