

ÖGUM-Mitteilungen

Österreichische Gesellschaft für Ultraschall in der Medizin



Bemerkenswerte Publikationen von ÖGUM-Mitgliedern: Ultraschall mit österreichischem Beitrag ...

Kapetas P¹, Woitek R^{1,2}, Clauser P¹, Bernathova M¹, Pinker K^{1,3}, Helbich TH⁴, Baltzer PA¹.

A Simple Ultrasound Based Classification Algorithm Allows Differentiation of Benign from Malignant Breast Lesions by Using Only Quantitative Parameters.

Mol Imaging Biol. 2018 Apr 9. doi: 10.1007/s11307-018-1187-x. [Epub ahead of print]

1 Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna, Waehringer Guertel 18 – 20, 1090, Vienna, Austria.

2 Department of Radiology, University of Cambridge, Cambridge Biomedical Campus, Cambridge, CB2 0QQ, UK.

3 Molecular Imaging and Therapy Service, Memorial Sloan-Kettering Cancer Center, 301 E 55th St, New York, NY, 10022, USA.

4 Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna, Waehringer Guertel 18 – 20, 1090, Vienna, Austria. thomas.helbich@meduniwien.ac.at

Abstract

Purpose We hypothesized that different quantitative ultrasound (US) parameters may be used as complementary diagnostic criteria and aimed to develop a simple classification algorithm to distinguish benign from malignant breast lesions and aid in the decision to perform biopsy or not.

Procedures One hundred twenty-four patients, each with one biopsy-proven, sonographically evident breast lesion, were included in this prospective, IRB-approved study. Each lesion was examined with B-mode US, Color/Power Doppler US and elastography (Acoustic Radiation Force Impulse-ARFI). Different quantitative param-

eters were recorded for each technique, including pulsatility (PI) and resistive Index (RI) for Doppler US and lesion maximum, intermediate, and minimum shear wave velocity (SWVmax, SWVinterm, and SWVmin) as well as lesion-to-fat SWV ratio for ARFI. Receiver operating characteristic curve (ROC) analysis was used to evaluate the diagnostic performance of each quantitative parameter. Classification analysis was performed using the exhaustive chi-squared automatic interaction detection method. Results include the probability for malignancy for every descriptor combination in the classification algorithm.

Results Sixty-five lesions were malignant and 59 benign. Out of all quantitative indices, maximum SWV (SWVmax), and RI were included in the classification algorithm, which showed a depth of three ramifications (SWVmax ≤ or > 3.16; if SWVmax ≤ 3.16 then RI ≤ 0.66, 0.66 – 0.77 or > 0.77; if RI ≤ 0.66 then SWVmax ≤ or > 2.71). The classification algorithm leads to an AUC of 0.887 (95% CI 0.818 – 0.937, p < 0.0001), a sensitivity of 98.46% (95% CI 91.7 – 100%), and a specificity of 61.02% (95% CI 47.4 – 73.5%). By applying the proposed algorithm, a false-positive biopsy could have been avoided in 61% of the cases.

Conclusions A simple classification algorithm incorporating two quantitative US parameters (SWVmax and RI) shows a high diagnostic performance, being able to accurately differentiate benign from malignant breast lesions and lower the number of unnecessary breast biopsies in up to 60% of all cases, avoiding any subjective interpretation bias.

Teh J¹, McQueen F², Eshed I³, Plagou A⁴, Klauser A⁵.

Advanced Imaging in the Diagnosis of Gout and Other Crystal Arthropathies.

Semin Musculoskelet Radiol. 2018 Apr; 22(2): 225–236. doi: 10.1055/s-0038-1639484. Epub 2018 Apr 19.

1 Department of Radiology, Nuffield Orthopaedic Centre, Oxford University Hospitals NHS Trust, Oxford, United Kingdom.

2 Department of Molecular Medicine and Pathology, University of Auckland, Auckland, New Zealand.

3 Department of Diagnostic Imaging, Sheba Medical Center, Tel Hashomer, Israel.

4 Department of Radiology, Private Institution of Ultrasonography, Athens, Greece.

5 Department of Radiology, Medical University of Innsbruck, Innsbruck, Austria.

Abstract

In recent years significant advances have been made in imaging techniques. Dual-energy computed tomography has revolutionized the ability to detect and quantify gout. The key ultrasound features of gout have been defined. Magnetic resonance imaging is an excellent modality for demonstrating the extent and severity of crystal arthropathies, but the findings may be nonspecific. This article summarizes the use of advanced imaging techniques in the diagnosis and assessment of gout and other crystal arthropathies.

Wegscheider H¹, Volk GF², Guntinas-Lichius O³, Moriggl B¹.

High-resolution ultrasonography of the normal extratemporal facial nerve.

Eur Arch Otorhinolaryngol. 2018 Jan; 275(1): 293 – 299. doi:10.1007/s00405-017-4797-z. Epub 2017 Nov 10.

Abstract

The technical advances in sonography of the past decade have supported the rapid improvement of high-resolution imaging, which enables the quick visualization of peripheral nerves at relatively limited costs. Recently, the possibility of visualizing the

extratemporal facial nerve (FN) has been considered. This manuscript describes the first systematic evaluation in cadavers, of a novel ultrasonographic approach with this specific aim. Eight cadaveric hemifaces were evaluated by means of high-frequency ultrasound with two linear (13 and 22 MHz) and a convex transducer (6.6 MHz), to detect the extratemporal course of the FN starting from its exit at the stylomastoid foramen: the main trunk, the parotid plexus between the two parts of the parotid gland, the distal branches terminating into the orbicularis oculi and the zygomatic major muscle. Ultrasound-guided color injections and FN dissection were performed to confirm the results. The main trunk of the FN,

as it exits the stylomastoid foramen, was correctly stained in 6/8 cases, the parotid plexus in 8/8 cases. The branches innervating the orbicularis oculi muscle were stained in 7/7 and the branches innervating the zygomatic major muscle in 6/7 hemifaces, after 1 was withdrawn due to insufficient image quality. Through our novel approach of high-resolution ultrasonography we could identify the various portions of the extratemporal FN, including its main trunk leaving the stylomastoid foramen, in an accurate and reproducible way. Further in vivo animal and clinical studies have been planned to confirm these initial results from cadavers.