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Ultrasound of the Lateral Femoral Cutaneous Nerve: A Review of the Literature and Pictorial Essay

Marco Becciolini, **Christopher Pivec, Georg Riegler**

We review the ultrasound (US) findings in patients who present with meralgia paresthetica (MP). The anatomy of the lateral femoral cutaneous nerve at the level where the nerve exits the pelvis and potential entrapment sites that can lead to MP are discussed. A wide range of pathological cases are presented to help in recognizing the US patterns of MP. Finally, our experience with US-guided treatment is discussed.

WFUMB Technological Review: How to Perform Contrast-Enhanced Ultrasound of the Lung

Ehsan Safai Zadeh, Christian Görg, **Helmut Prosch**, Christian Jenssen, Michael Blaivas, Christian B Laursen, Niels Jacobsen, Christoph Frank Dietrich

The use of ultrasound has revolutionized the evaluation of pulmonary complaints and pathology. Historically, most lung ultrasound uses described are limited to B-mode, M-mode and occasionally color Doppler. However, the use of contrast can significantly expand the diagnostic capabilities of lung ultrasound. Ultrasound contrast enables significant expansion of therapeutic and intervention capabilities. We provide a detailed description of contrast administration, phases and uses in lung ultrasound. Additionally provided are example contrast use cases and illustrative examples of contrast use in a wide range of lung ultrasound applications including pneumonia, atelectasis, pulmonary embolism and neoplasms. Clinical practice examples will help providers incorporate contrast use into their lung ultrasound practice.

Ultrasound of Small Nerves

Stefan Meng, Hannes Platzgummer, Alexander Loizides, Ke-Vin Chang**, Hannes Gruber**

Nerve ultrasound has become an integral part of the diagnostic workup of peripheral neuropathies. Especially in the examination of small nerves, ultrasound provides superior image quality by using high frequency transducers. For a selection of small nerves, this article summarizes the local anatomy and common pathologies and offers simple instructions for determining their location with ultrasound including some cases with pathologies. This selection of nerves comprises the great auricular nerve, the supraclavicular nerves, the suprascapular nerve, the medial antebrachial cutaneous nerve, the lateral antebrachial cutaneous nerve, the palmar cutaneous branch of the median nerve, the long thoracic nerve, the intercostobrachial nerve, the posterior cutaneous nerve, the infrapatellar branch of the saphenous nerve, the medial calcaneal nerve, and the deep peroneal nerve at the ankle. Following our recommendations, these nerves can be swiftly located and tracked along their course to the site of the pathology.

Differentiation of Critical Illness Myopathy and Critical Illness Neuropathy Using Nerve Ultrasonography

Leonhard Gruber, Alexander Loizides, Hannes Gruber, Elisabeth Skalla, Silke Haushammer, Corinne Horlings, Ronny Beer, Raimund Helbok, Wolfgang N Löscher

Intensive care unit-acquired weakness occurs frequently in intensive care unit patients, including critical illness myopathy (CIM) and critical illness polyneuropathy (CIPN). The authors present a prospective study to assess the ultrasound pattern sum score to differentiate between confirmed CIM, sensory neuropathy, and CIPN cases. Cross-sectional areas of 12 predefined nerve segments in 16 patients were sonographically examined. Single-nerve cross-sectional areas and ultrasound pattern sum score values were compared; results are given as P-values and receiver operating characteristic area under the curve (AUC). In neuropathy, significant single-nerve cross-sectional area enlargement was observed in the median (P = 0.04), ulnar (P = 0.04), and fibular nerves (P = 0.0003). The ultrasound pattern sum score could reliably differentiate between pure CIM and neuropathy (P = 0.0002, AUC 0.92), CIM and sensory neuropathy (P = 0.001, AUC 0.88), and CIM and CIPN (P = 0.007, AUC 0.92), but not between sensory neuropathy and CIPN (P = 0.599, AUC 0.48). Nerve ultrasonography reliably identifies neuropathy in intensive care unit-acquired wea-

kness, yet cannot differentiate between sensory neuropathy and CIPN. A standardized ultrasound algorithm can serve as a fast bedside test for the presence of neuropathy in intensive care unit-acquired weakness.

Valvuloplasty in 103 fetuses with critical aortic stenosis: outcome and new predictors for postnatal circulation

A Tulzer, **W Arzt**, R Gitter, E Sames-Dolzer, M Kreuzer, R Mair, **G Tulzer**

To review our experience with fetal aortic valvuloplasty (FAV) in fetuses with critical aortic stenosis (CAS) and evolving hypoplastic left heart syndrome (eHLHS), including short- and medium-term postnatal outcome, and to refine selection criteria for FAV by identifying preprocedural predictors of biventricular (BV) outcome. This was a retrospective review of all fetuses with CAS and eHLHS undergoing FAV at our center between December 2001 and September 2020. Echocardiograms and patient charts were analyzed for pre-FAV ventricular and valvular dimensions and hemodynamics and for postnatal procedures and outcomes. The primary endpoints were type of circulation 28 days after birth and at 1 year of age. Classification and regression-tree analysis was performed to investigate the predictive capacity of pre-FAV parameters for BV circulation at 1 year of age. During the study period, 103 fetuses underwent 125 FAVs at our center, of which 87.4 % had a technically successful procedure. Technical success per fetus was higher in the more recent period (from 2014) than in the earlier period (96.2 % (51/53) vs 78.0 % (39/50); P = 0.0068). Eighty fetuses were liveborn after successful intervention and received further treatment. BV outcome at 1 year of age was achieved in 55 % of liveborn patients in our cohort after successful FAV, which is significantly higher than the BV-outcome rate (23.7 %) in a previously published natural history cohort fulfilling the same criteria for eHLHS (P = 0.0015). Decision-tree analysis based on the ratio of right to left ventricular (RV/LV) length combined with LV pressure (mitral valve regurgitation maximum velocity (MR-Vmax)) had a sensitivity of 96.97 % and a specificity of 94.44 % for predicting BV outcome without signs of pulmonary arterial hypertension at 1 year of age. The highest probability for a BV outcome was reached for fetuses with a pre-FAV RV/LV length ratio of < 1.094 (96.4 %) and for those fetuses with a RV/LV length ratio ≥ 1.094 to < 1.135 combined with a MR-Vmax of ≥ 3.14 m/s (100 %). FAV could be performed with high success rates and an acceptable risk with improving results after a learning curve. Pre-FAV RV/LV length ratio combined with LV pressure estimates were able to predict a successful BV outcome at 1 year of age with high sensitivity and specificity. © 2022 The Authors. Ultrasound in Obstetrics & Gynecology published by John Wiley & Sons Ltd on behalf of International Society of Ultrasound in Obstetrics and Gynecology.