NEU-S01

Research and Clinical Application of Ultrasound in Neurological Disease: Footprint, Development and Future Perspective

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Thanks to the chair of organizing committee for the invitation to let me talk about my experience in ultrasound research in the past, why I started and how to do ultrasound research. First of all, our work was to diagnose the stenosis of the carotid artery, and then to start with transcranial ultrasound and color duplex ultrasound to evaluate the intracranial arteries. Because the arterial system and all known vascular risk factors cannot explain why the cerebrovascular disease of Asian is different from that of Westerners. We started thinking about whether we can solve this problem with research into veins. For several years, due to little research in this field at that time, our work findings submitted to Stroke, Neurology, Annals of Neurology, and The Lancet had never been rejected. In 2012, I was invited to give a speech in Florida, USA, on the topic of venous outflow impairment and neurological disorders. In San Francisco 2014, I was invited again to talk about venous outflow impairment and small vessel disease. Through accumulation of research experience and logical deduction, we deeply believe the cerebral small vessel diseases, intracranial arteries and even dementia all have a causal relationship with vein problem. I am very happy to see that the research reports of other teams in recent years have also verified our original hypothesis. At present, we are conducting research to fine the simplest method to screen out those who have vein problems and then develop some non-invasive prevention and treatment methods.

Thanks to the chairman of the organizing committee for the invitation, letting me talk about my past experience in ultrasound research, why I started and how to do ultrasound research. First, our work was to diagnose carotid stenosis, and then we began to evaluate intracranial arteries with transcranial Doppler and color duplex. Because the arterial system and all known vascular risk factors cannot explain why the cerebrovascular disease of Asian is different from that of Westerners, I started thinking about whether we could address this question with vein studies. Over the past years, submissions of our work to Stroke, Neurology, Annals of Neurology and The Lancet have never been rejected due to the lack of research in the field at the time. In 2012, I was invited to give a lecture in Florida, USA on the topic of venous outflow disorders and neurological diseases. In San Francisco in 2014, I was again invited to talk about Venous Outflow Disorders and Small Vessel Disease. Through the accumulation of research experience and logical deduction, we are convinced that cerebral small vessel disease, intracranial arteries and even dementia are all causally related to venous problems. I am very happy to see that research reports by other groups in recent years have also verified our original hypothesis. We are currently studying how to screen out people with vein problems in the simplest way, and then develop some non-invasive methods of prevention and treatment.

NEU-S02

Ultrasound in Neuromuscular Disorders: The Past

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Ultrasonography is a safe and easily available technique in clinical practice of different specialties. The improvement in the resolution of ultrasonography enables the exploration of structural changes in peripheral nerve and muscles.

Focal neuropathy, especially the entrapment neuropathy, was the most common neuropathy evaluated by the ultrasonography. In addition to the morphology evaluation, the dynamic view of the

relationship of nerve and the nearby structures supplies valuable information of the pathogenesis. The use of ultrasonography is expanding with time, and the ultrasonography has been applied in different neuromuscular disorders other than focal neuropathy, including inflammatory neuropathy, hereditary neuropathy, and muscle diseases. Another unique investigation of ultrasound is the vascular status, and several studies had explored the vessel status of the nerve or muscle in neuromuscular disorders. In this talk, I would review the previous study of ultrasound in neuromuscular disorders, and would introduce how to applicate the ultrasound into clinical practice.

NEU-S03

Neuromuscular Ultrasound : Future Perspective and Advancement

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Ultrasound as a clinical tool has long been used to aid diagnosis in many clinical scenarios. However, its use in peripheral nervous diseases and myopathies has only been explored since around the past decade. Currently, ultrasound has a role in diagnosis, real-time intervention, and sequential follow-up. But further studies are still needed to establish a more robust foundation for its routine use in clinical settings.

Apart from routine analysis, ultrasound, as a diverse tool, has more to provide. There are novel ways and utilities currently under investigation, which may be added to our clinical toolkit soon. Here, I will share with you recent studies using new mechanics of the ultrasound in the diagnosis of neuromuscular disorders.

NEU-S04

Pulsatilla Tinnitus with Sigmoid Sinus Wall Abnormalities: A Case Report

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Pulsatile tinnitus can be divided into arterial, venous and arteriovenous according to the source of vascular abnormalities. The most common cause of venous pulsatile tinnitus reported in the literature is an abnormality of the sigmoid sinus wall. If venous pulsatile tinnitus is present, a mastoid murmur may be heard on physical examination, attenuated by compression of the ipsilateral IJV. However, the auscultation step is often overlooked in ultrasonography of pulsatile tinnitus. In this case report, we will present the diagnostic process in a patient with pulsatile tinnitus and review the literature.

NEU-S05

Follow Up of Carotid Ultrasound after Stenting and Angioplasty

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Carotid ultrasound provides non-invasive, real-time examination to follow up carotid artery stenting (CAS) and angioplasty. There are variable factors associated with in-stent stenosis (ISR) and recurrent ischemic stroke after CAS. It is crucial to detect ISR and prevent subsequent ischemic events. Here we analyze 154 cases who received carotid ultrasound follow up after carotid stenting and angioplasty from MacKay Memorial hospital during November 2016 to February 2023. Multicenter prospective studies are required to confirm our results.

NEU-S06

Are There Different Subsequent Effects of Various Radiotherapies on Vasculopathy?

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Head and neck cancer (HNC) is the seventh most prevalent cancer worldwide, claiming the lives of approximately 325,000 people annually. Radiation therapy (RT) is a fundamental part of the treatment for HNC. Due to significant advancements in the last two decades, the survival rates for HNC have improved significantly. However, this progress has led to a new challenge in managing long-term complications related to RT after HNC remission. One such consequence is radiation vasculopathy, which is associated with accelerated atherosclerosis and an increased risk of carotid artery stenosis (CAS) or vertebral artery stenosis (VAS).

In light of this, our cohort hope to study the frequency of early and rapid progression of post radiation vasculopathy between different radiation therapy techniques in the modern era, and we hope to find out the potential predictors for these complications.

NEU-S07

Autonomic Dysregulation in Massive Cerebral Infarction

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The early identification of patients with large hemisphere infarctions (LHIs) at risk of fatal brain edema may result in better outcomes. Autonomic cardiac dysfunction is a common complication after acute ischemic stroke (IS). A quantitative model using parameters of heart rate variability and clinical data obtained during admission may be a predictor of morbidity and mortality from LHI.

This prospective study enrolled all patients with LHI involving >50% of the middle cerebral artery (MCA) admitted to our neurological intensive care unit within 48hours of symptom onset. Early clinical and HRV parameters were analyzed regarding their ability to predict patient outcomes. Fifty–four patients with LHIs were identified, 25 (46.3%) with complete MCA infarction (CMCA), and 29 (53.7 %) with incomplete MCA infarction (IMCA).A comparison of HRV in all patients with stroke and in control subjects showed statistically significant differences of increased HRV parameters between IS subgroups and controls in very low frequency (VLF), low frequency (LF), high frequency (HF) after the adjustment for associated cardiovascular risk factors .A comparison of HRV in stroke patients with CMAC and IMCA at admission showed significant increased HRV in very low frequency (VLF), low frequency (LF), and a trend in high frequency (HF) at admission. It also showed significant increased HRV in very low frequency (VLF), and a trend in low frequency (LF), and high frequency (HF) on day 5-7. The predictors of CMCA score included: initial National Institutes of Health Stroke Scale (NIHSS) score ≥19 at admission and on day 5-7, measurements of HRV of VLF (cut off value = 7.02), HF (cut off value = 5.40) and LF (cut off value = 5.56). The cutoff CMCA score was 2, with a sensitivity of 94.74% and specificity of 50.29% and area Under Curve 0.81969.