

Universitaire Henri-Mondor in Paris, France where he investigated numerous interventional radiology procedures and techniques, most notably, the development of the intravascular detachable balloon catheter in the late 1960's. In 1979, his work would become recognized by renowned neurosurgeon Dr. Charles Drake who recruited him to London, Ontario where he became the Director of Neuroradiology - marking the start to Dr. Debrun's career in North America where he would stay for the remainder of his career. During that period Dr Debrun created the foundation for homemade manufacturing of detachable balloons, building on one of the largest world series for use of detachable balloons in cerebrovascular diseases. Dr. Debrun went on to become the chairman of the department of radiology at Massachusetts General Hospital in 1982, director of interventional neuroradiology at Johns Hopkins Hospital in 1986, before arriving at the University of Illinois Chicago where he remained until his retirement in 2001. Dr Debrun's subsequent notable contributions included the calibrated-leak balloon catheter, initial pioneering of glue embolization, setting the foundation for the field of preoperative AVM embolization, and as an early adopter of the Guglielmi detachable coil. During his time at the University of Illinois Chicago, he established the first integrated Neurointerventional surgery program in the USA between Neurosurgery and Radiology, establishing a well sought fellowship program, and was succeeded by the late Dr. Victor Aletich.

Conclusion Dr. Debrun lectured extensively and wrote hundreds of articles on neurointerventional surgery throughout this career. His contributions established the foundation for several techniques which have since become standard practice in present-day neurosurgery.

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DELAYED LEUKOENCEPHALOPATHY AFTER PIPELINE EMBOLIZATION: CASE SERIES

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Introduction One of the devices used for treatment of aneurysms is the Pipeline Embolization Device (PED, Medtronic, Irvine, CA, USA). Initially approved in 2011, it has shown good efficacy for treating a variety of aneurysms in both the anterior and posterior circulations, including complex and wide necked aneurysms. Among the rarely reported complications of endovascular treatment of cerebral aneurysms is delayed leukoencephalopathy. Generally these patients exhibit signs of demyelination, as evidenced by high signal changes in white matter areas, distal and remote from the coils or flow diverter. Some patients exhibit headaches or hemiparesis, headache, or are asymptomatic. Several hypotheses have been put forward regarding the etiology of this leukoencephalopathy after intervention. Some authors have suggested foreign body emboli, hypersensitivity reactions, such as to nickel or polymers used in catheters, as well as contrast induced encephalopathy. We present the cases of three consecutive patients who presented with vague neurological symptoms and were

ultimately found to have demyelination and lab studies consistent with delayed leukoencephalopathy.

Methods Case series of three patients who underwent pipeline stenting and developed delayed leukoencephalopathy.

Results All three patients were women in the 6th and 7th decades of life with aneurysms of the anterior circulation. All underwent diagnostic angiography without issue. The first patient had the most severe presentation with hemiparesis and an NIHSS of 3, MRI showed numerous enhancing lesions in the R cerebral hemisphere with internal cavitations concerning for infectious or demyelinating etiology. The second patient complained of generalized weakness and was admitted after MRA showed multiple sites of enhancement distal to the PED. The third patient complained of headache and eye pain, and MRI imaging showed multiple enhancing lesions with surrounding edema and microhemorrhage, most pronounced in the left external capsule. This was thought to be similar to the other cases of acute demyelination. All three patients were initially treated empirically with antibiotics, and were transitioned to pulse dose steroids with oral taper. The second and third patients in the series were treated with doxycycline as well. The aneurysms were successfully treated nonetheless. The patients remained on frequent surveillance MRI/MRA, and their presenting symptoms resolved before resolution of the lesions on imaging. 2 of the 3 patients are now completely at neurological baseline, and one of the patients is undergoing further workup for MS.

Conclusion Delayed Leukoencephalopathy is a known, rare complication of endovascular procedures. Patients may have a wide range of presentations. Treatment for this condition includes steroids, although there is no consensus on the dosing, timing, or duration of treatment. Additionally, the etiology remains unknown, although hypotheses exist regarding hypersensitivity reactions, foreign body reactions, or emboli stemming from the intervention. Further research is needed to better understand this process, as well as studies regarding optimal management and long term outcomes.

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REMOTE ROBOTIC NEUROINTERVENTION

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Background Given the scale of acute ischemic stroke, the impact and time criticality of endovascular intervention, and the relatively small number of operators globally, technology aimed at enabling safe, remote, intervention has great value. A prototype remotely operated neuroendovascular robotic system was tested as part of a collaboration between Remedy Robotics Inc. and the University of California medical centers. The primary goal of the study was to assess the feasibility and technical challenges involved in facilitating multiple off-site operators in remote endovascular navigation in a single day.

Methods Preoperative connectivity checks were performed prior to the procedure. Four remotely located clinicians and one on-premise clinician from hospitals within and outside the University of California (UC) network connected to the robot.