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E-168 ADDED VALUE OF MR VESSEL WALL IMAGING IN SPONTANEOUS INTRACRANIAL DISSECTING ANEURYSMS

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Purpose Dissecting intracranial aneurysms (DIA) can present with subarachnoid hemorrhage or ischemia, and are more common in the posterior circulation. Radiographically, DIA have similar morphological features to fusiform and dolichoectatic atherosclerotic aneurysms, with difficult diagnosis on traditional CTA and MRI/MRA cross sectional imaging. In addition, the rebleeding risk from ruptured DIA is considerably higher reaching up to 71.4% with 46.7% mortality, necessitating early diagnosis and treatment. We aimed to distinguish specific imaging features of spontaneous DIA using high resolution MR vessel wall imaging (VWI).

Methods In a retrospective analysis of our MR VWI database between Jan 2016 and March 2019, we identified patients with suspected DIA diagnosed by clinical history, CTA/MRA imaging findings, and conventional angiography. MRI 3D TOF and MR VWI were reviewed by two neuroradiologists for imaging findings that were diagnostic for DIA including intramural hematomas, intimal flaps and double lumen. Following diagnosis on MRI/3D TOF MRA, MR VWI was serially assessed for additional findings that could aid or confirm the diagnosis.

Results Seven patients (4M:3F) with mean age 62 ± 13.7 were proven to have DIA, all located in the posterior circulation (6 vertebral:1 basilar). All patients presented with either severe headaches or diplopia/dizziness. There was no family history of IA, but high incidence of hypertension and hyperlipidemia (30%). On MRI/3D TOF MRA, intramural hemorrhage was observed to diagnose two DIAs, which was also confirmed with intramural T1 hyperintense signal on MR VWI. Two aneurysms demonstrated fusiform morphology with intraluminal thrombus on MRI/3D TOF MRA without diagnosis, however, MR VWI identified an enhancing dissection flap and double lumen pathology for definitive DIA diagnosis. Two DIA were suspected with suggestion of intimal flap on MRI/3D TOF MRA, but improved visualization of enhancing intimal flap on MR VWI confirmed the diagnosis. One aneurysm was diagnosed based on clinical history and an associated enhancing dissection flap with tapered occlusion of the contralateral vertebral artery, but no imaging features on 3D TOF MRA or MR VWI suggested a dissecting aneurysm.

Conclusions Spontaneous DIA are more commonly diagnosed in the posterior circulation. MR VWI is a valuable tool in confirming the diagnosis and differentiating fusiform thrombosed aneurysms from DIA with improved visualization of T1 hyperintense intramural hemorrhage, and enhancing intimal flap, and/or double lumen intracranial dissection pathology.

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E-169 INSTITUTIONAL EXPERIENCE FROM 750 NEUROENDOVASCULAR PROCEDURES USING TRANSRADIAL APPROACH – A PROSPECTIVE OBSERVATIONAL STUDY

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Background More evidence is emerging in the last two years regarding the feasibility of using transradial approach (TRA) for most neuroendovascular procedures. In addition, TRA has better safety profile and patient satisfaction compared to the traditional transfemoral approach. In this study, we present our experience in transitioning the ‘radial-first’ approach over a course of one year.

Methods We prospectively collected demographic and procedural variables of all patients who underwent neuroendovascular procedure using the TRA between starting from March 2019. Exclusion criteria included: 1) known vasooclusive disease such as Raynaud disease, Takayasu arteritis, or thromboangiitis obliterans; 2) known complex radial or brachiocephalic anatomy such as aberrant right subclavian artery or situs inversus; 3) procedures that require the use of devices that are larger than 8-French. Predefined interim analyses were planned at 500, 750 and 1000 patients.

Results A total of 750 patients included in this analysis (615 underwent cerebral angiogram and 135 underwent an interventional procedure). Mean age was 55.8 (± 15.1), 442 (58.9%) were females, and 434 (57.9%) underwent the procedure in outpatient setting. The right radial artery was used in 730 (97.3%) cases, ulnar artery in 16 (2.1%), and left radial artery in 4 (0.5%) cases. A 4/5-French slender sheath was used for cerebral angiograms and a 5/6 or 6/7-French slender sheath was used for interventional procedures. Interventional procedures included flow diversion in 27 cases, 25 cerebral aneurysm primary coiling cases, 17 stent-assisted coiling cases, 11 balloon-assisted coiling cases, 26 tumor and middle meningeal artery (MMA) embolization cases, and 7 mechanical thrombectomy cases. The overall success rate was 94.8% (711/750): 95.4% (587/615) for cerebral angiograms and 91.9% (124/135) for patients who received an intervention. Overall success rate improved from 93.3% in the first 3 months of the study to 98.3% in the last 3 months ($P=0.049$). Complications related to access sites were seen in 7 (0.9%) patients: 5 patients had forearm hematoma and 2 had prolonged vasospasm/arm pain that resolved with conservative management. Other complications included post-procedural stroke in 2 patients and sent thrombosis in 1 patient.

Conclusion Incorporation of radial-first approach for neuroendovascular procedures is safe and feasible. TRA is associated

with learning curve and success rate improved during the study period.

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E-170 BENIGN CEREBRAL VASOCONSTRICTION IMMEDIATELY AFTER CAROTID ARTERY STENTING

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Purpose This study is to evaluate benign cerebral vasoconstriction on the ipsilateral anterior circulation immediately after carotid artery stenting (CAS) in the near-occlusion of proximal internal carotid artery (ICA).

Materials and Methods 15 patients with near occlusion were retrospectively reviewed, who were selected among all patients who conducted CAS for proximal ICA stenosis since January 2009. Immediate post-stenting angiographic images were evaluated by two neuroradiologists for the presence of vasoconstriction.

Results Among 15 patients with near-occlusion, significant vasoconstrictions in the ipsilateral anterior circulation after CAS were shown in 7 patients (71.1 ± 5.3 years) but not in the other 8 patients. In all 7 patients, significant vasoconstrictions were shown to occur in isolated territory without anterior and/or posterior communicating collateral flows ($P < 0.001$). However, there are no significant statistical differences in neurologic status, procedural conditions, and comorbidity between two groups.

Conclusions Benign cerebral vasoconstriction immediately after carotid artery stenting could occur in the ipsilateral anterior circulation and in the condition with near-occlusion and isolated circulation.

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E-171 THE BASILAR SHIELD: A NORMAL VARIANT BULBOUS CONFIGURATION OF THE BASILAR ARTERY TIP

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Introduction The intracranial arterial vasculature has numerous anatomical variants, which vary from largely benign to having remarkable clinical significance. A lesser known variant can be described as a bulbous configuration of the basilar artery tip, also referred to as a 'shield-like appearance' or 'junctional dilatation.' However, this variant's significance and standard nomenclature have not been described in the literature to as of yet.

Methods Retrospective query of radiology imaging reports was performed for vascular specific imaging of the head (CTA/MRA/cerebral angiography), which included descriptions related to the basilar artery anatomical variant from 2005–2019 at a single institution. Key-word search descriptions included 'bulbous tip', 'junctional dilatation', and 'shield-like' in addition to 'basilar.' Imaging studies were individually scrutinized for true presence of the basilar variant, and were assessed for any change in appearance over time. Primary data-points collected included length of time between imaging

studies with stable imaging appearance, basilar artery aneurysm incidence, other intracranial aneurysm incidence, and frequency of subarachnoid hemorrhage associated with aneurysm rupture.

Results Initial query yielded 345 imaging reports which included the basilar artery search terms in question. Fifty-two patients were found to have multiple vascular exams of the head on different occasions, and 50 of these were confirmed to have the typical appearance of the basilar shield variant present on imaging. Risks factors of cerebral aneurysm development were variably present in this cohort, including hypertension, history of smoking, family history of cerebral aneurysms, connective tissue disease, and autosomal dominant polycystic kidney disease. On review of follow-up imaging studies, the basilar shield variant was found to be stable in appearance over time in all 50 patients, without interval expansion or basilar tip aneurysm development. Interval follow-up ranged from 39 to 4,664 days, with a mean follow-up length of 3.83 years, and total patient-years of follow-up of 192. More than half (54%) of this patient cohort demonstrated concurrent cerebral arterial aneurysms. Three patients were found to have history of subarachnoid hemorrhage related to cerebral aneurysm rupture, however none of these cases were related to the basilar artery. No adverse neurological events were found which could be attributed to the basilar shield variant.

Conclusion The bulbous configuration of the basilar artery tip dubbed the 'basilar shield' is a benign, normal variant of the posterior intracranial arterial circulation. Further studies may be necessary to determine if there is any association with cerebral aneurysms, but the variant itself is innocuous. It is important for both radiologists and clinicians to recognize its characteristic appearance and benign nature. True basilar tip aneurysms have a high morbidity and mortality in rupture, and confusion with the basilar shield may lead to unnecessary work-up, imaging, and/or treatment.

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E-172 CT PERFUSION DERIVED HYPOPERFUSION INTENSITY RATIO PREDICTS INFARCT VOLUME AND GROWTH PRE- AND POST-ENDOVASCULAR THERAPY IN LARGE VESSEL OCCLUSION ACUTE ISCHEMIC STROKE

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Purpose Evaluation of large vessel occlusion (LVO) acute ischemic stroke (AIS) patients for endovascular therapy (EVT) is a multifaceted decision-making process. Previous work using CT angiography has demonstrated that collateral blood supply is a key determinant of infarct volume and functional outcomes in LVO AIS. The CT Perfusion (CTP) derived Hypoperfusion Intensity Ratio (HIR), $T_{max} > 10$ s over $T_{max} > 6$ s within the affected territory, is a surrogate marker of collateral status. The purpose of this study is to investigate whether an association exists between HIR and infarct volumes in LVO AIS.

Materials and Methods IRB approval was obtained. The medical records and imaging of patients with suspected LVO AIS