Transradial approach for neuroendovascular procedures: a single-center review of safety and feasibility

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Purpose: To review the safety and feasibility of transradial access (TRA) for neuroendovascular procedures in a single center.

Materials: Retrospective analysis was performed of 215 patients evaluated for 247 consecutive TRA neuroendovascular procedures from January 2016 to August 2019. Exclusion criteria included sheath > 6 F, Barbeau D waveform, radial artery < 2 mm on ultrasound evaluation, history of severe aortic tortuosity and radial artery occlusion. TRA was attempted in 215 patients (56.2% women; median age, 58.9 y) who underwent 247 consecutive procedures (cerebral angiogram [n = 143], aneurysm embolization [n = 33], mechanical thrombectomy [n = 19], AVM embolization [n = 14], head and neck tumor embolization [n = 9], middle meningeal artery embolization [n = 6], carotid angiogram [n = 5] and carotid stenting [n = 8], epistaxis treatment [n = 4], other [n = 6]. Procedures were evaluated for technical success (defined as successful radial artery access and completion of the intended procedure without crossover to an auxiliary access site), and patients were evaluated for adverse events (AEs) during follow-up at 30 days.

Results: Technical success was 91.5%. Immediate AEs (4.0%) included radial access site hematoma (n = 3), arm pain (n = 4), radial artery occlusion (n = 2), and severe radial artery spasm (n = 1). 30-day adverse events (0.4%) included radial artery pseudoaneurysm (n = 1). Twenty-one cases (8.5%) required crossover to transfemoral access.

Conclusions: TRA for neuroendovascular procedures is safe and feasible across a wide range of neuroendovascular interventions.

Pipeline embolization of posterior circulation aneurysms: a meta-analysis

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Purpose: The Pipeline Embolization Device, a flow diverter, has been proven to be effective in treating intracranial aneurysms. Although ample evidence has shown its efficacy in obliterating anterior circulation aneurysms proximal to the internal carotid arteries, its application for aneurysms in the posterior circulation is debatable due to the concern of occluding collaterals supplying the brain stem. In this meta-analysis, our goal is to evaluate the safety and efficacy of the Pipeline Embolization Device for the treatment of posterior circulation aneurysm.

Materials: PubMed was searched for publications from its establishment to July 2019. The following keywords were used: “posterior circulation,” “aneurysm,” “pipeline,” and “embolization.” The following variables were investigated: study’s baseline characteristics, aneurysm type, aneurysm location, complete occlusion rate, and postprocedural ischemia rate. Statistical analysis was performed with STATA 16.1 (STATA Corp., College Station, TX, USA).

Results: Twenty-four studies of 896 patients and 885 aneurysms were included in our meta-analysis. The mean imaging follow-up lengths ranged from 6.8 to 21.1 months. Based on aneurysm type, the percentages of saccular, fusiform and dissecting aneurysms were 50.4%, 33.9%, and 15.6%. The most common three posterior aneurysm locations were vertebral artery (36.8%), basilar artery (21.3%), and posterior inferior cerebellar artery (17.1%). Postoperatively, the pooled complete occlusion rate was 0.645, 95% CI [0.477-0.812]. The overall incidence of ischemia was 0.091, 95% CI [0.049-0.132].

Conclusions: The Pipeline Embolization Device is feasible for treating aneurysms located in the posterior circulation. The complete occlusion rate is acceptable. Operators should be cognizant about procedural planning to avoid postoperative ischemia.

Conscious sedation versus general anesthesia on outcomes in mechanical thrombectomy for patients with acute ischemic stroke

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Purpose: Workflow optimization is essential in the setting of mechanical thrombectomy for acute ischemic stroke (AIS). Either conscious sedation or general anesthesia can be used during intervention. The purpose was to study the differences between the type of anesthesia used and its impact on time to recanalization during mechanical thrombectomy.

Materials: 94 patients between September 2017 and August 2019 presented to the emergency room (ER) with stroke-like symptoms. These patients were deemed eligible for mechanical thrombectomy by the stroke neurology service. The study group comprised of 58 males (ages 27-91) and 36 females (ages 46-92) with a median National Institutes of Health Stroke Scale (NIHSS) of 15 (range, 3-35). Anesthesia was either conscious sedation (CS) (n = 54) or general anesthesia (GA) (n = 40). CS comprised of fentanyl boluses with or without propofol or dexmedetomidine infusion. GA was either rapid sequence induction and intubation in the angiography suite (n = 26) or intubation in the ER (n = 14). Primary endpoint was time to recanalization, defined as a modified Treatment in Cerebral Ischemia (mTICI) ≥ 2b after intervention. Statistical analysis between groups was performed using the non-parametric Kruskal Wallis test, chi-square analysis, or z-score test for population proportions.

Results: Comparisons between anesthesia and intervention times indicate statistically significant lower door to groin puncture time (p<0.016) by 39 minutes and door to recanalization time (p<0.045) by 40.5 minutes between the CS and GA groups. Analysis for mortality shows statistically significant lower 7-day (22.5% vs. 3.7%, p≤0.005) and 30-day (25% vs. 5.5%, p≤0.007) mortality between the GA group and the CS group. Thirty-day mortality is statistically significant when comparing intubation in ER versus angiography suite within the GA group (36% vs. 11.5%, p≤0.06).