

Background

- ❖ AHA/ASA Guidelines for endovascular treatment of acute ischemic stroke emphasize the importance of rapid patient selection, optimization of endovascular procedures and organizations of systems of care. However, the use of advanced stroke imaging is left to institutional preference. Our institution, which has been performing endovascular procedures using a rapid MRI/MRA imaging protocol, transitioned in 2015 to a CTA/CTP imaging protocol.

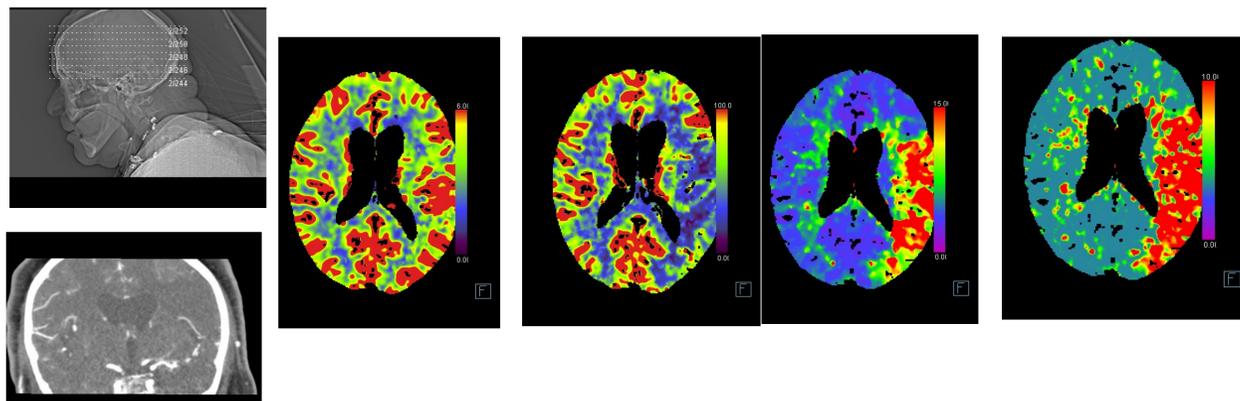
Objective

- ❖ To evaluate the impact of the transition to computerized tomography perfusion scan (CTP) on endovascular performance, as measured by door to imaging time and door to skin puncture, and the improvement of the neurological deficit measured by NIHSS difference at admission and discharge.

Methods

- ❖ All endovascular thrombectomy procedures performed from January 2014 to Dec 2016 were retrospectively reviewed from our prospectively collected GWTG stroke database.
- ❖ A novel CT perfusion protocol was instituted, with injection of **40 cc iodinated contrast** and 40 seconds acquisition time with a table toggle technique providing 9.6 cm coverage of the brain. The CTA images were generated from the CT perfusion data without a need for extra scan time or new contrast injection. The CT perfusion data was post processed using a deconvolution technique and color maps were generated (Figure 1).
- ❖ Demographics, and Joint Commission-mandated performance measures including time to advanced imaging, time to skin puncture and discharge status were obtained.
- ❖ Continuous variables were assessed for normality by the Kolmogorov–Smirnov test. Normally distributed data were reported as a mean and mean percentage. Means were compared by one-way ANOVA for the three consecutive years. Non-parametric data were reported as median and analysed using the Kruskal–Wallis test or Wilcoxon Ranks test. A Bonferroni correction was used to establish statistical significance in the presence of multiple comparisons. Categorical variables were compared using χ^2 test.

Figure 1



Results

- ❖ A total of 91 acute stroke thrombectomy procedures were initially identified.
- ❖ The median age was 65 (IQR:53-77) with 52% males. 78% of the strokes were caused by an anterior circulation large vessel occlusion.
- ❖ Although the overall number of stroke admissions remained relatively stable and IV-TPA treatment remained the same, the proportion of endovascular treated patients increased significantly (23/1003 in 2014 vs. 42/1159 in 2015 vs. 59/1110 until May 2016) (Figure 2).
- ❖ Door to advanced imaging median time (52 mins vs 24 mins vs. 25 minutes; p=0.023) and door to skin puncture median time (130 mins vs. 100 mins vs. 81 mins; p=0.007) demonstrated statistical significant difference in the anterior circulation strokes (Figure 3).
- ❖ A significant improvement in median NIHSS at discharge was noted after implementation of the protocol (Figure 4).

Figure 2

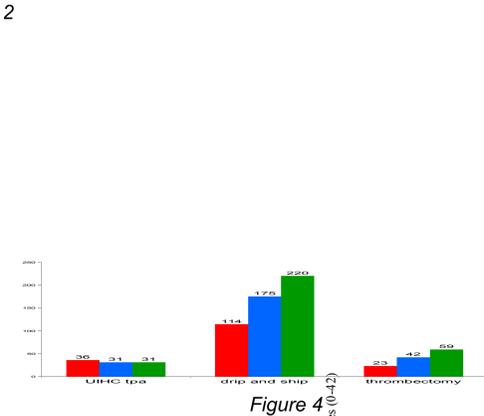


Figure 3

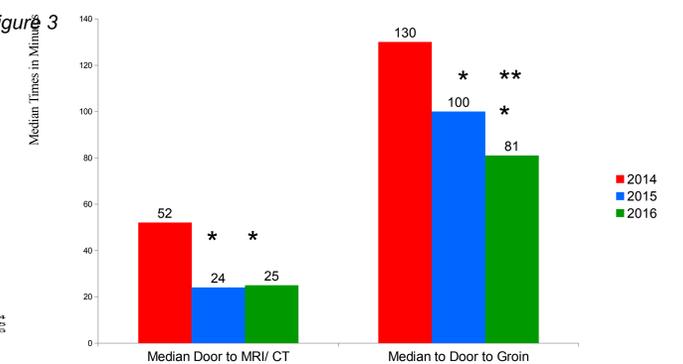
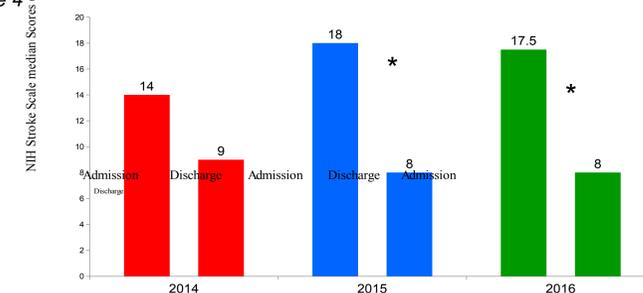


Figure 4



Conclusions

- ❖ Transition from MRI to CT-based imaging protocols was associated with improvement in the speed of delivery of endovascular acute care in a Comprehensive Stroke Center despite the logistic challenges of implementation and lack of familiarity with the new technique.
- ❖ Transition from MRI to CT-based imaging might be a reasonable approach to improve endovascular care.