

CLINICAL AUDIT TEMPLATE:

PICA and pericallosal artery origin inclusion in magnetic resonance angiography with time-of-flight technique for screening and monitoring intracranial aneurysms

Descriptor:

An audit of magnetic resonance angiography (MRA) with time-of-flight (TOF) technique for screening and surveillance aneurysms to assess for inclusion of posterior inferior cerebellar artery (PICA) near the inferior margin and pericallosal artery near the superior margin.

Background:

MRA with TOF technique has a high sensitivity in screening for intracranial aneurysms¹, though up to 24% of PICAs are not visualized with current screening methods². A small percentage of intracranial aneurysms arise from PICA and pericallosal origins, and including these origins are necessary for a comprehensive assessment.

The Cycle:

Protocol: Our institutional protocol includes TOF reconstruction from top of corpus callosum to C2 in the plane of the hard palate.

Target: Ninety-five percent of TOF MRAs should include the vertebral artery (VA) transdural passage, and the pericallosal artery origin. Including the transdural VA passage will ensure no intracranial PICA origin will be missed, even if not visualized on the imaging. Ninety-five percent allows for a small degree of error in technical and/or patient specific factors.

Assessment:

Data Collected: Studies are determined as adequate (includes both VA transdural passage and pericallosal artery origins), or inadequate when one or both are not included in the imaging. Inadequate studies are assessed for which portion was excluded (PICA origin, pericallosal artery origin, or both), which site the study was performed, and differences in study protocols. Reports for inadequate studies are reviewed to determine if comment was made of the excluded region.

Number: 100 intracranial aneurysm screening and surveillance MRAs with TOF technique.

Suggestions if target not met:

If the target is not met, inadequate studies should be evaluated for causes including technical factors (ie: inadequate protocol), and patient factors (ex: patient demographics, location of examination, length of technician experience). If technical issues are identified, current protocols should be re-evaluated and revised. If patient factors are identified, education sessions should be provided to the technologists in addition to providing information at each location emphasizing the importance of PICA and pericallosal artery origin inclusion in aneurysm screening TOF MRAs. A re-audit aiming for 95% compliance should be performed.

Resources:

Picture archiving communication system (PACS), review by Radiology Resident, data analysis, potential re-audit, report writing, and presentation.

References:

1. Sailer AMH, Wagemans BAJM, Nelemans PJ, de Graaf R, van Zwam WH. Diagnosing intracranial aneurysms with MR angiography – Systematic review and meta-analysis. *Stroke* 2014;45:119-126.
2. Akgun V, Battal B, Bozkurt Y, Oz O, Hamcan S, Sari S, et al. Normal anatomical features and variation of the vertebrobasilar circulation and its branches: an analysis with 64-detector row CT and 3T MR angiographies. *ScientificWorldJournal* 2013; 2013:620162.

Submitted by:

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