

16-Channel Multidetector-row Computed Tomographic Angiography to Diagnose BCVI

Author	Reference	Data Class	Conclusions/Comments
Berne JD, et al.	Sixteen-slice multi-detector computed tomographic angiography improves the accuracy of screening for blunt cerebrovascular injury. J Trauma 2006; 60:1204-1210.	II	<p>Design:</p> <ol style="list-style-type: none"> 1. Prospective screening 435 patients with CTA 2. Angiography to study those with abnormal or equivocal CTA results 3. Patients with normal CTA followed <i>clinically</i> <p>Findings:</p> <ol style="list-style-type: none"> 1. 24 patients with 25 injuries 2. Patients with normal CTA did not manifest ischemic complications during clinical follow-up <p>Comments:</p> <p>Cannot assess true sensitivity or NPV compared to reference standard (i.e. – angiography)</p>
Biffi WL, et al.	Sixteen-slice computed tomographic angiography is a reliable noninvasive screening test for clinically significant blunt cerebrovascular injuries. J Trauma 2006; 60:745-752.	II	<p>Design:</p> <ol style="list-style-type: none"> 1. Prospective screening 331 patients with CTA 2. Angiography to study those with abnormal or equivocal CTA results 3. Patients with normal CTA followed <i>clinically</i> <p>Findings:</p> <ol style="list-style-type: none"> 1. 17 patients with BCVI imaged with both CTA and angiography met screening criteria 2. Patients with normal CTA did not manifest ischemic complications during clinical follow-up <p>Comments:</p> <p>Cannot assess true sensitivity or NPV compared to reference standard (i.e. – angiography)</p>
Eastman AL, et al.	Computed tomographic angiography for the diagnosis of blunt cervical vascular injury: is it ready for primetime? J Trauma	II	<p>Design:</p> <ol style="list-style-type: none"> 1. Prospective blinded observational 2. Screened for BCVI with CTA 3. 146 patients followed with angiography (both positive and negative CTA results)

16-Channel Multidetector-row Computed Tomographic Angiography to Diagnose BCVI

	2006; 60:925-929.		<p>Findings:</p> <ol style="list-style-type: none"> 1. 43 patients with 46 BCVIs 2. BCVI sensitivity 98%, specificity 100%, PPV 100%, NPV 99% 3. Carotid artery injury sensitivity and specificity 100% 4. Vertebral artery injury sensitivity 96%, specificity 100% <p>Comments:</p> <ol style="list-style-type: none"> 1. Small number of patients with more than one injured vessel <ol style="list-style-type: none"> A. Literature reports frequency of 18%-32%
Malhotra AK, et al.	Computed tomographic angiography for the diagnosis of blunt carotid/vertebral artery injury: a note of caution. Ann Surg 2007; 246(4): 632-42.	II	<p>Design:</p> <ol style="list-style-type: none"> 1. Prospective observational study. 2. Patients at-risk for BCVI based on institutional screening criteria. 3. 92 patients studied with both CTA and DSA over 40-month period. <p>Findings:</p> <ol style="list-style-type: none"> 1. 23 patients with 26 BCVIs 2. Sensitivity 74%, NPV 90% <ol style="list-style-type: none"> A. 1st half of study: sensitivity 67%, NPV 70% B. 2nd half of study: sensitivity 100%, NPV 100% 3. Specificity 84%, PPV 63% <ol style="list-style-type: none"> A. 1st half of study: specificity 78%, PPV 75% B. 2nd half of study: specificity 86%, PPV 65% 4. False positive CTAs: most were “Grade I” injuries <ol style="list-style-type: none"> A. Carotid art: 3 of 4 B. Vertebral art: 6 of 7 5. False negative CTAs: <ol style="list-style-type: none"> A. Carotid art: 4 injuries (grade I, $n = 2$, grade II, $n = 1$, grade III, $n = 1$) B. Vertebral art: 3 injuries (all grade I) <p>Comments:</p> <ol style="list-style-type: none"> 1. Results based on imaging reports <ol style="list-style-type: none"> A. No re-assessment to counter the “learning curve” 2. Small number of patients with more than one injured vessel <ol style="list-style-type: none"> A. Literature reports frequency of 18%-32%

16-Channel Multidetector-row Computed Tomographic Angiography to Diagnose BCVI

<p>Sliker CW, et al.</p>	<p>Diagnosis of Blunt Cerebrovascular Injuries with 16-channel Multidetector Computed Tomography: Accuracy of Whole-body MDCT Compared to Neck MD-CTA. AJR (In Press, accepted for publication - 2007).</p>	<p>III</p>	<p>Design:</p> <ol style="list-style-type: none"> 1. Two patient subsets <ol style="list-style-type: none"> A. One retrospectively identified through review of radiology reporting system B. One identified through prospective observation 2. Neck CTA vs. whole-body MDCT with angiography reference <ol style="list-style-type: none"> A. CTAs reviewed retrospectively to account for “learning curve” B. Angiography reports utilized 3. Angiography techniques not standardized <ol style="list-style-type: none"> A. Four-vessel exams not routine B. Exam of all segments within given vessel not routine <p>Findings:</p> <ol style="list-style-type: none"> 1. BCVI in 83 out of 108 patients <ol style="list-style-type: none"> A. 25 out 83 patients with more than one injury (30%) 2. Neck MD-CTA and whole-body MDCT results statistically comparable results for diagnosing BCVI 3. Carotid artery cervical segments <ol style="list-style-type: none"> A. Neck MD-CTA sensitivity 64%, specificity 94% B. Whole-body MDCT sensitivity 69%, specificity 82% 4. Vertebral artery cervical segments <ol style="list-style-type: none"> A. Neck MD-CTA sensitivity 68%, specificity 100% B. Whole-body MDCT sensitivity 74%, 91% <p>Comments:</p> <ol style="list-style-type: none"> 1. Injuries not graded
--------------------------	---	------------	---

16-Channel Multidetector-row Computed Tomographic Angiography to Diagnose BCVI

<p>Hollingsworth W, et al.</p>	<p>The diagnostic accuracy of computed tomography angiography for traumatic or atherosclerotic lesions of the carotid and vertebral arteries: a systematic review. Eur J Radiol 2003; 48:88-102.</p>	<p>Design:</p> <ol style="list-style-type: none">1. Literature Review2. Two studies discussing blunt trauma3. Two studies penetrating trauma4. 39 studies atherosclerosis or other (i.e. – dissection) <p>Findings:</p> <ol style="list-style-type: none">1. CTA sensitivity for atherosclerotic stenoses > 30% is 95%2. CTA specificity for atherosclerotic stenoses > 30% is 98%-100% <p>Comments:</p> <ol style="list-style-type: none">1. Many traumatic lesions are either small intimal flaps, injuries with stenosis < 30 %, or pseudoaneurysms<ol style="list-style-type: none">A. AVF less common but important2. Studies concerned with trauma based on older scanners
--------------------------------	--	---