Visualization of STA-MCA Anastomosis by Multidetector-Row Helical CT Angiography

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Purpose
Multidetector-row CT (MDCT) has enabled the imaging of a wide range with good spatial resolution in a short scanning time. We applied helical CT angiography using the MDCT system to visualizing the anastomosis surgically created between the superficial temporal artery (STA) and middle cerebral artery (MCA), which was difficult to be performed by conventional CT angiography due to limited length of a scanning area.

Materials & Methods
Helical CT angiography was performed on an MDCT scanner in seven patients after STA-MCA bypass surgery. They included five patients with stenosis or occlusion of the MCA and two with lesion of the internal carotid artery. The mean period after surgery was 22 months. We performed helical CT angiography with 4 x 0.5 mm collimation, helical pitch of 3, 0.5 sec rotation time, and coverage of the whole brain in 40-60 sec. The raw data were reconstructed to actual sections with thickness of 0.5 mm and a section interval of 0.4 or 0.5 mm. We injected 100 ml of contrast agent (300 mgI/ml) at a rate of 3 ml/sec from the antecubital vein starting 20-25 sec prior to scan initiation. CT angiograms obtained were assessed visually for demonstration of the STA-MCA anastomosis. Comparison with conventional angiograms was available in five patients.

Results
The STA-MCA anastomosis was demonstrated in all patients. However, the degree of the demonstration of MCA branches was variable. On images viewed from inside, the STA running beneath a bone flap was well depicted as well as distal MCA branches. Findings on CT angiography corresponded well with those on conventional angiography in the five patients.

Conclusion
Helical CT angiography using the MDCT technique is a promising method to visualize STA-MCA anastomosis with minimal invasiveness.