· 诊治分析 ·

颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞致醒后脑梗死机械取栓术成功一例并文献复习

梁文宝，欧志杰，张 炜，殷振江，曹力西

【摘要】　大动脉粥样硬化所致脑梗死较为常见，而颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞所致醒后脑梗死较为少见，单纯内科治疗预后较差。本文报道了1例颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞所致醒后脑梗死患者，成功行机械取栓术且预后良好。通过复习相关文献发现，颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞行机械取栓术是安全、有效的，而取栓术后颅内血管再通及Willis环代偿良好的患者未行颈动脉夹层处支架成形术也许是安全可行的。

【关键词】　脑梗死；颈内动脉夹层；机械取栓术；历史文献

【中图分类号】R 743. 33　【文献标识码】B　DOI：10. 3969/j. issn. 1008－5971. 2017. 02. 024

梁文宝，欧志杰，张炜，等. 颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞致醒后脑梗死机械取栓术成功一例并文献复习［J］. 实用心脑肺血管病杂志，2017，25（2）：94－97.［www. syxnf. net］

LIANG W B，OU Z J，ZHANG W，et al. Waken－up cerebral infarction caused by internal carotid artery dissection－induced tandem internal carotid artery/middle cerebral artery occlusion and successfully treated by mechanical thrombectomy：a case report and literatures review［J］. Practical Journal of Cardiac Cerebral Pneumal and Vascular Disease，2017，25（2）：94－97.

Waken－up Cerebral Infarction Caused by Internal Carotid Artery Dissection－induced Tandem Internal Carotid Artery/Middle Cerebral Artery Occlusion and Successfully Treated by Mechanical Thrombectomy：a Case Report and Literatures Review

LIANG Wen－bao，*OU Zhi－jie*，*ZHANG Wei*，*YIN Zhen－jiang*，*CAO Li－xi*

Department of Neurology，*the Central Hospital of Karamay*，*Karamay* 834000，*China*

【Abstract】　Large artery atherosclerosis－induced cerebral infarction is common on clinic，but waken－up cerebral infarction caused by internal carotid artery dissection－induced tandem internal carotid artery/middle cerebral artery occlusion is rare，with poor prognosis treated with merely medical treatment. This paper reported 1 patient with waken－up cerebral infarction caused by internal carotid artery dissection－induced tandem internal carotid artery/middle cerebral artery occlusion，who was successfully treated by mechanical thrombectomy with good prognosis. According to the reported literatures，we found that，mechanical thrombectomy is safe and effective in treating internal carotid artery dissection－induced tandem internal carotid artery/middle cerebral artery occlusion，while do not carry out stent－assisted angioplasty for internal carotid artery dissection may be safe and feasible in patients with postoperative intracranial vascular recanalization and good compensation of Willis circle after thrombectomy.

【Key words】　Brain infarction；Internal carotid artery dissection；Mechanical thrombectomy；Historical article

脑梗死是常见神经系统疾病之一，其发病率、致残率、复发率及病死率均较高，尤其是脑部大血管闭塞所致脑梗死。由于机械取栓术可迅速恢复脑梗死区血流，改善患者神经功能及预后，因此目前临床多采用机械取栓术治疗脑部大血管闭塞所致脑梗死，但其用于治疗发病时间不明的醒后脑梗死，尤其颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞所致醒后脑梗死的研究报道较少。本文报道了1例成功行机械取栓术的颈内动脉夹层并颈内动脉/大脑中动脉串联闭塞所致醒后脑梗死患者，并进行文献复习。

834000 新疆维吾尔自治区克拉玛依市中心医院神经内科

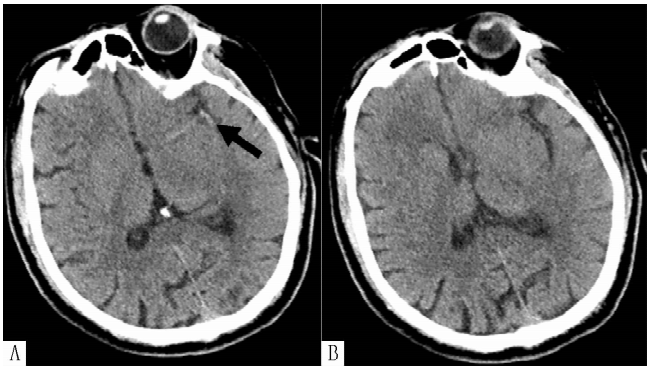
1　病历简介

患者，男，58岁，汉族，因“醒后发现右侧肢体无力、意识不清3 h”于2016－05－15入住新疆克拉玛依市中心医院急诊科。患者家属于入院前3 h发现患者晨起后右侧肢体无力及不能言语，意识不清，无明显恶心、呕吐，无肢体抽动及二便失禁。查体：体温36. 5 ℃、脉搏80次/分、呼吸频率18次/分、血压140/90 mm Hg（1 mm Hg＝0. 133 kPa），意识不清，查体不能配合，运动型失语，双侧瞳孔等大同圆，对光反应可，眼球向左侧凝视，右侧鼻唇沟变浅，伸舌不配合，颈软，双肺呼吸音粗，未闻及干湿啰音，心腹未见明显异常，肌力及感觉查体不配合，右上肢坠落试验阳性，右下肢不能维持正常生理姿势，右侧肢体病理征阳性，左侧肢体可见自发活动。自

主神经功能检查：皮肤黏膜色泽正常，无多毛多汗，无指甲变形变脆，无二便异常。格拉斯哥昏迷量表（GCS）评分为 9 分，美国国立卫生研究院卒中量表（NIHSS）评分为 15 分。急诊查血常规、肝肾功能、电解质及凝血功能正常，心电图示窦性心律，颅脑 CT 检查示左侧大脑中动脉区见高密度影，余未见明显异常（见图 1）；颅脑 MRI 示左侧大脑中动脉供血区大面积脑梗死（见图 2）。患者家属否认患者既往有高血压、高脂血症病史及吸烟史。临床考虑脑梗死，责任血管为左侧颈内动脉。

征得患者家属同意后患者行急诊全脑血管造影术。术前留置胃管并通过胃管给予阿司匹林肠溶片 300 mg、氯吡格雷 300 mg、阿托伐他汀钙片 40 mg。术中患者取平卧位，行常规心电图、血压监测，局部麻醉满意后于双侧腹股沟区常规消毒、铺巾，以右侧腹股沟韧带中点下 1. 5 cm 处股动脉为穿刺点，采用 Seldinger 技术穿刺右股动脉，利用置换导丝置入 6F 导管鞘并静脉注射肝素 2 000 U，之后沿导管鞘在 0. 035 英寸导丝引导下置入 5F 单弯行脑血管造影术，造影结果示左侧颈内动脉起始部闭塞（见图 3A），呈“火焰征”样改变（见图 3B），考虑夹层可能；左侧大脑中动脉未显影，右侧颈内动脉见左侧大脑前动脉 A1 段，故考虑左侧颈内动脉末端 T 型处闭塞（见图 3C）。与患者家属沟通并交待造影结果后告知其手术风险，家属坚决要求手术，故予以机械取栓术：将 6F ENVOY 导引导管置于左侧颈总动脉近颈内动脉起始部，通过微导丝小心穿过病变血管处，进入颈内动脉血管真腔后小心上行至左侧大脑中动脉 M1 段，通过微导管造影，证实 M1 段远血流通畅，采用微导管及 Solitaire 4 mm × 20 mm 支架进行取栓（见图 4），取出血栓后患者即刻有自主睁眼反应，右侧肢体有活动并能抬离床面，但躁动明显，再次行左侧颈内动脉造影发现左侧颈内动脉仍存在闭塞，行右侧颈内动脉造影发现前交通动脉至左侧大脑中动脉有血流通过（见图 5A），左侧椎动脉造影发现后交通动脉至左侧大脑中动脉代偿良好（见图 5B、C），考虑取栓后左侧颈内动脉后交通段以上开通，前后交通动脉能良好代偿左侧大脑半球血供，故结束手术，拔出导管鞘并压迫右股动脉穿刺点 15 min，确认无出血后加压包扎、送返病房。

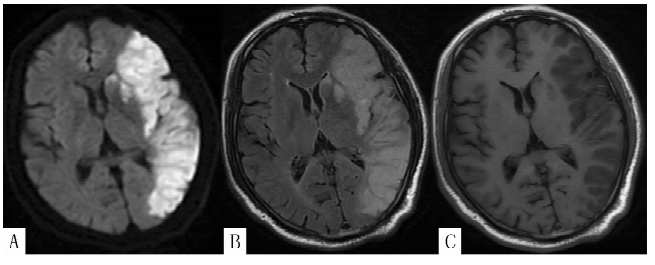
术后予以依达拉奉（30 mg/次、2 次/d）保护脑神经，前列地尔（10 μg/次、1 次/d）扩张血管并改善侧支循环，术后第 2 天予以阿司匹林肠溶片 100 mg、氯吡格雷 75 mg、阿托伐他汀钙片 40 mg 治疗，患者病情持续好转，躁动缓解。术后第 3 天查体：意识好转，GCS 为 15 分，NIHSS 为 1 分，仍有部分运动型失语，双侧瞳孔等大同圆，对光反应可，眼球各向活动可，无凝视，面纹对称，伸舌居中，右侧肢体肌力Ⅴ，右侧肢体病理征阴性。2016 - 05 - 31（术后 16 d）复查颅脑 MRI 弥散加权成像（DWI）、T2 加权、液体衰减反转恢复序列（FLAIR）及 T1 加权示左侧大脑中动脉供血区脑梗死面积较前明显缩小（见图 6），复查全脑血管造影示左侧颈内动脉起始部至海绵窦段似见显影，后交通段以远显影良好（见图 7）。



注：A 图示左侧大脑中动脉高密度影（箭头所指处），B 图示左侧大脑半球略有水肿但未见明显梗死

图 1　术前患者颅脑 CT 检查结果

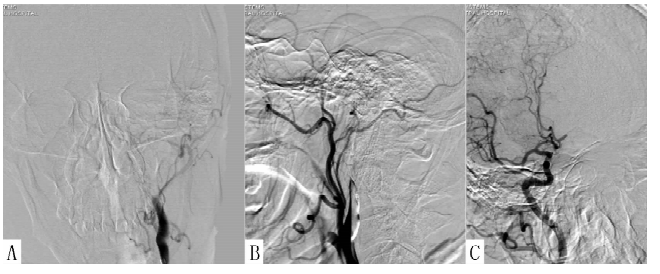
Figure 1　CT examination results before operation



注：A 为弥散加权成像，B 为 T2 加权及液体衰减反转恢复序列成像，C 为 T1 加权成像，示左侧大脑中动脉供血区大面积脑梗死

图 2　术前患者颅脑 MRI 检查结果

Figure 2　Cerebral MRI examination results before operation



注：A 图示左侧颈内动脉起始部闭塞，B 图示“火焰征”样改变，C 图示左侧大脑中动脉未显影

图 3　患者术前全脑血管造影结果

Figure 3　Cerebral angiography examination results before operation

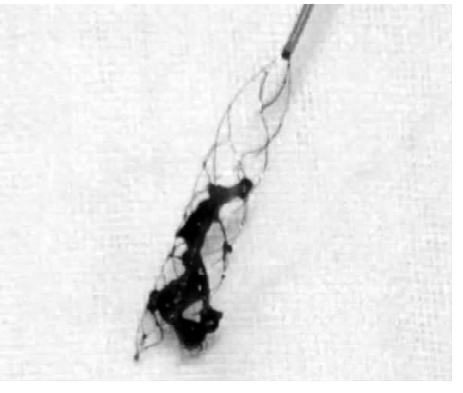
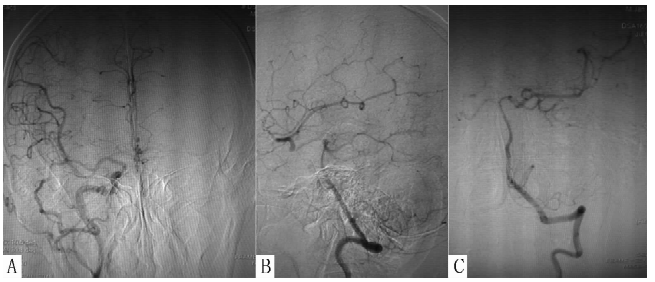


图 4　术中取出的血栓

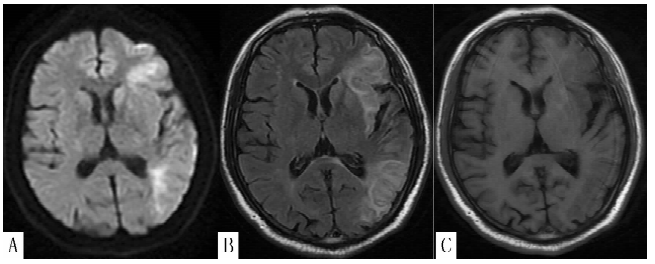
Figure 4　Removed thrombus during operation



注：A 图示机械取栓术后右侧前交通动脉向左侧大脑中动脉供血，B、C 图分别为左侧椎动脉侧、正位全脑血管造影，示机械取栓术后由后交通动脉向左侧大脑中动脉代偿供血

图 5　患者术中全脑血管造影结果

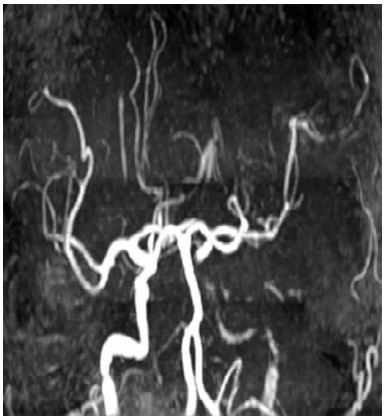
Figure 5　Cerebral angiography examination results during operation



注：A 为弥散加权成像，B 为 T2 加权及液体衰减反转恢复序列成像，C 为 T1 加权成像，示左侧大脑中动脉供血区脑梗死面积较前明显缩小

图 6　患者术后 16 d 颅脑 MRI 检查结果

Figure 6　Cerebral MRI examination results after 16 days of operation



注：图示左侧颈内动脉起始部至海绵窦段似见显影，后交通段以远显影良好

图 7　患者术后 16 d 全脑血管造影结果

Figure 7　Cerebral angiography examination results after 16 days of operation

2　讨论

由单侧颈内动脉夹层所致颈内动脉起始部狭窄或闭塞/颅内动脉（如颈内动脉末端 T 型部、大脑中动脉）串联闭塞而引起的醒后脑梗死较为少见，且患者预后较差，致残率及致死率较高，临床治疗较为棘手。大动脉闭塞所致脑梗死患者常采用重组组织型纤溶酶原激活剂（rt－PA）静脉溶栓治疗，但治疗后血管再通率较低，整体疗效欠佳[1－5]，一般静脉溶栓治疗后 2 h 内血管再通率为 8% ～9%[6－7]，24～72 h 后血管再通率约为 31%[8]。机械取栓术血管再通率较高，可快速有效地挽救大动脉闭塞所致脑梗死患者缺血半暗带脑细胞，从而改善患者预后[9－16]。

COHEN 等[17]对 6 例颈动脉夹层并颈动脉/颅内动脉串联闭塞患者先于颈内动脉夹层处行支架成形术，再结合支架取栓术开通颅内闭塞动脉，结果显示 5 例患者血管完全再通，随访 90 d 时改良 Rankin 量表（mRS）评分为 0～2 分，且未发生出血等并发症，另 1 例患者因无法找到血管真腔而无法开通闭塞血管。RATANAPRASATPORN 等[18]研究结果显示，采用支架成形术治疗的颈动脉夹层并颈动脉/颅内动脉串联闭塞患者血管再通率高于采用动脉溶栓者。SPIOTTA 等[19]对 3 例颈动脉内膜剥脱术后并发急性颈动脉/颅内动脉串联闭塞患者行颈动脉支架成形术及颅内支架取栓术成功，3 例患者血管完全再通且预后良好。JENSEN 等[20]对 24 例颈内动脉夹层患者行血管内介入治疗，结果显示 22 例患者血管再通。

MARNAT 等[21]研究认为，颈内动脉夹层并颈内动脉/颅内动脉串联闭塞患者应先行颅内支架取栓术，然后通过对侧颈内动脉及椎动脉造影了解闭塞的颅内动脉是否再通及是否存在完整 Willis 环，如前后交通动脉能良好地代偿（良好代偿定义为两侧静脉回流对称或延迟 <2 s）已开通的闭塞血管血供则不进行支架成形术，如 Willis 环代偿不充分或静脉回流延迟≥2 s 则进一步行支架成形术。颈内动脉夹层范围较大时需采用多个支架相互衔接以覆盖夹层，而自发性夹层常累及硬化较严重的迂曲血管，行支架成形术的难度较大，手术操作时间长；如先行颈动脉支架成形术再行支架取栓术，则要十分小心地将取栓支架卡在颈动脉内，且在取栓过程中需中间导管尽量越过颈动脉支架远端，会增加手术操作难度，延长手术时间[22－23]。因此，对于颈内动脉夹层并颈内动脉/颅内动脉串联闭塞患者，应优先考虑颅内支架取栓术。

本例患者因无法明确确切发病时间而诊断为醒后脑梗死，术前行颅脑 CT 检查见大脑中动脉高密度影，但未见明显梗死灶，颅脑 MRI 检查示左侧大脑中动脉供血区域大面积脑梗死，责任血管为颈内动脉和/或大脑中动脉，若采用单纯内科保守治疗则预后较差，可能会在脑水肿高峰期引发脑疝而导致患者死亡[24]，故征得患者家属同意后积极行机械取栓术：术中在微导丝引导下将微导管小心地通过颈内动脉夹层处并进入血管真腔，先行颅内动脉支架取栓术，取栓完成后通过对侧颈内动脉造影及椎动脉造影发现患者左侧颈内动脉自后交通动脉段至颈内动脉末端 T 型部完全开通，提示前后交通动脉可良好地向左侧大脑半球供血；随着再灌注完成，患者临床症状迅速好转，最终仅遗留部分运动型失语；术后 16 d 复查颅脑 MRI、DWI 示坏死脑组织区域较术前明显缩小且未见出血，T1 加权成像未发现大脑中动脉供血区域广泛低信号改变，说明机械取栓术挽救了大部分脑组织，证实机械取栓术治疗颈内动脉夹层并颈内动脉/颅内动脉串联闭塞安全有效，与既往文献报道结果一致[25－26]。

通过结合本例患者并复习相关文献，笔者认为对于颈内动脉夹层并颈内动脉/颅内动脉串联闭塞所致醒后脑梗死患者，应优先行颅内机械取栓术，而对于取栓术后颅内血管再通及 Willis 环能良好代偿的患者，也许不行颈动脉夹层处支架成形术也是安全可行的。

参考文献

[1] RUBIERA M, RIBO M, DELGADO - MEDEROS R, et al. Tandem internal carotid artery/middle cerebral artery occlusion: an independent predictor of poor outcome after systemic thrombolysis [J]. Stroke, 2006, 37 (9): 2301 - 2305.

[2] LAVALLÉE P C, MAZIGHI M, SAINTMAURICE J P, et al. Stent - assisted endovascular thrombolysis versus intravenous thrombolysis in internal carotid artery dissection with tandem internal carotid and middle cerebral artery occlusion [J]. Stroke, 2007, 38 (8): 2270 - 2274.

[3] DEL ZOPPO G J, POECK K, PESSIN M S, et al. Recombinant tissue plasminogen activator in acute thrombotic and embolic stroke [J]. Ann Neurol, 1992, 32 (1): 78.

[4] KIM Y S, GARAMI Z, MIKULIK R, et al. Early recanalization rates and clinical outcomes in patients with tandem internal carotid artery/middle cerebral artery occlusion and isolated middle cerebral artery occlusion [J]. Stroke, 2005, 36 (4): 869 - 871.

[5] LINFANTE I, LLINAS R H, SELIM M, et al. Clinical and vascular outcome in internal carotid artery versus middle cerebral artery occlusions after intravenous tissue plasminogen activator [J]. Stroke, 2002, 33 (8): 2066 - 2071.

[6] LIVING A O D. Tissue plasminogen activator for acute ischemic stroke. The national institute of neurological disorders and stroke rt - pa stroke study group [J]. N Engl J Med, 1995, 333 (24): 1581 - 1587.

[7] HACKE W, KASTE M, BLUHMKI E, et al. Thrombolysis with alteplase 3 to 4. 5 hours after acute ischemic stroke [J]. N Engl J Med, 2008, 359 (13): 1317 - 1329. DOI: 10. 1056/NEJMoa0804656.

[8] ENGELTER S T, RUTGERS M P, HATZ F, et al. Intravenous thrombolysis in stroke attributable to cervical artery dissection [J]. Stroke, 2009, 40 (12): 3772 - 3776. DOI: 10. 1161/STROKEAHA. 109. 555953.

[9] SAVER J L, JAHAN R, LEVY E I, et al. SOLITAIRE with the Intention for Thrombectomy (SWIFT) Trial: Design of a Randomized, Controlled, Multicenter Study Comparing the SOLITAIRE Flow Restoration Device and the MERCI Retriever in Acute Ischaemic Stroke [J]. Int J Stroke, 2014, 9 (5): 658 - 688. DOI: 10. 1111/j. 1747 - 4949. 2012. 00856. x.

[10] GOYAL M, DEMCHUK A M, MENON B K, et al. Randomized assessment of rapid endovascular treatment of ischemic stroke [J]. N Engl J Med, 2015, 372 (11): 1019 - 1030. DOI: 10. 1056/NEJMoa1414905.

[11] CAMPBELL B C, MITCHELL P J, KLEINIG T J, et al. Endovascular therapy for ischemic stroke with perfusion - imaging selection [J]. N Engl J Med, 2015, 372 (11): 1009 - 1018. DOI: 10. 1056/NEJMoa1414792.

[12] BERKHEMER O A, FRANSEN P S, BEUMER D, et al. A randomized trial of intraarterial treatment for acute ischemic stroke [J]. N Engl J Med, 2015, 372 (1): 11 - 20. DOI: 10. 1056/NEJMoa1411587.

[13] GOYAL M, DEMCHUK A M, MENON B K, et al. Randomized assessment of rapid endovascular treatment of ischemic stroke [J]. N Engl J Med, 2015, 372 (11): 1019 - 1130. DOI: 10. 1056/NEJMoa1414905.

[14] SAVER J L, GOYAL M, BONAFE A, et al. Stent - retriever thrombectomy after intravenous t - PA vs. t - PA alone in stroke [J]. N Engl J Med, 2015, 372 (24): 2285 - 2295. DOI: 10. 1056/NEJMoa1415061.

[15] BERKHEMER O A, FRANSEN P S, BEUMER D, et al. A randomized trial of intraarterial treatment for acute ischemic stroke [J]. N Engl J Med, 2015, 372 (1): 11 - 20. DOI: 10. 1056/NEJMoa1411587.

[16] CAMPBELL B C, MITCHELL P J, KLEINIG T J, et al. Endovascular therapy for ischemic stroke with perfusion - imaging selection [J]. N Engl J Med, 2015, 372 (11): 1009 - 1018. DOI: 10. 1056/NEJMoa1414792.

[17] COHEN J E, LEKER R R, EICHEL R, et al. Emergency endovascular revascularization of tandem occlusions: Internal carotid artery dissection and intracranial large artery embolism [J]. J Clin Neurosci, 2016, 28: 157 - 161. DOI: 10. 1016/j. jocn. 2015. 12. 003.

[18] RATANAPRASATPORN L, GROSSBERG J A, SPADER H S, et al. Endovascular treatment of acute carotid occlusion [J]. Clin Neurol Neurosurg, 2013, 115 (12): 2521 - 2523. DOI: 10. 1016/j. clineuro. 2013. 10. 008.

[19] SPIOTTA A M, VARGAS J, ZUCKERMAN S, et al. Acute stroke after carotid endarterectomy: time for a paradigm shift Multicenter experience with emergent carotid artery stenting with or without intracranial tandem occlusion thrombectomy [J]. Neurosurgery, 2015, 76 (4): 403 - 410. DOI: 10. 1227/NEU. 0000000000000642.

[20] JENSEN J, SALOTTOLO K, FREI D, et al. Comprehensive analysis of intra - arterial treatment for acute ischemic stroke due to cervical artery dissection [J]. J Neurointerv Surg, 2016. pii: neurintsurg - 2016 - 012421. DOI: 10. 1136/neurintsurg - 2016 - 012421.

[21] MARNAT G, MOURAND I, EKER O, et al. Endovascular management of tandem occlusion stroke related to internal carotid artery dissection using a distal to proximal approach: insight from the recost study [J]. AJNR Am J Neuroradiol, 2016, 37 (7): 1281 - 1288. DOI: 10. 3174/ajnr. A4752.

[22] COHEN J E, GOMORI J M, LEKER R R, et al. Recanalization of symptomatic carotid artery dissections causing occlusion with multiple stents: the use of delayed double - contrast road map [J]. Neurol Res, 2010, 32 (3): 293 - 296.

[23] COHEN J E, GOMORI J M, ITSHAYEK E, et al. Single - center experience on endovascular reconstruction of traumatic internal carotid artery dissections [J]. J Trauma Acute Care Surg, 2012, 72 (1): 216 - 221. DOI: 10. 1097/TA. 0b013e31823f630a.

[24] 金灿, 王苇. ASPECT 评分的临床应用进展 [J]. 国际医学放射学杂志, 2015, 38 (5): 418 - 422.

[25] WETTER A, SHIN M R, MEILA D, et al. Treatment of middle cerebral artery occlusion and internal carotid artery dissection with combined mechanical thrombectomy and stenting of the internal carotid artery. A case report [J]. Neuroradiol J, 2013, 26 (1): 84 - 88.

[26] LEWIS J B, MERWICK A, LAOIDE R Ó, et al. Therapeutic decision making in acute stroke due to carotid artery dissection: a potential role for percutaneous vascular intervention following intravenous thrombolysis [J]. Case Rep Vasc Med, 2013. DOI: 10. 1155/2013/121696.

（收稿日期：2016 - 11 - 06；修回日期：2017 - 02 - 10）

（本文编辑：李伟）