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Solitaire AB 支架取栓联合动脉溶栓治疗急性缺血性脑卒中的临床疗效

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摘要 目的:探讨 Solitaire AB 支架取栓联合动脉溶栓治疗急性缺血性脑卒中的临床疗效。**方法:**收集 2014 年 8 月至 2016 年 8 月我院收治的 15 例急性缺血性脑卒中患者,进行 Solitaire AB 支架取栓联合动脉溶栓治疗,通过评价患者治疗前后的美国国立卫生研究院卒中量表评分(NIHSS 评分)比较治疗效果,通过评价患者随访期间的改良 Rankin 评分(mRS)和哥拉斯哥昏迷评分(GCS)比较预后情况。**结果:**15 例患者通过动脉溶栓联合 1~3 次 Solitaire AB 取栓后,14 例患者均达到部分或完全再通,1 例患者因生命体征不稳而终止取栓手术,再通率为 93.3%。患者出院时 NIHSS 评分为(4.33±1.45),显著低于术前的(12.93±4.25)($P<0.05$)。15 例患者均通过 3 个月的后随访,改良 Rankin(mRS)评分均显示良好,其中 2 例为 2 分,5 例为 1 分,8 例为 0 分。所有患者均未发生血管再闭塞等相关并发症。**结论:**Solitaire AB 支架取栓联合动脉溶栓治疗急性缺血性脑卒中的临床效果良好且安全性高。

关键词:脑卒中;脑缺血;Solitaire AB 支架;机械取栓;动脉溶栓

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Clinical Efficacy of Mechanical Solitaire AB Stents Thrombectomy Combined with Intra-arterial Thrombolysis in the Treatment of Patients with Acute Ischemic Stroke

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ABSTRACT Objective: To investigate the clinical efficacy of mechanical solitaire AB stents thrombectomy combined with intra-arterial thrombolysis in the treatment of patient with acute ischemic stroke. **Methods:** Fifteen patients with acute ischemic stroke admitted into our hospital from August 2014 to August 2016 were treated with mechanical thrombectomy with solitaire AB stents plus intra-arterial thrombolysis. The National Institutes of Health Stroke Scale score (NIHSS) of all patients were evaluated before and after treatment to compare the clinical efficacy. The prognosis of patients between two groups were compared via evaluating modified Rankin score (mRS) and gelasijia coma score (GCS). **Results:** After mechanical thrombectomy with solitaire AB stents plus intra-arterial thrombolysis treatment, 14 patients achieved complete or part recanalization, and 1 patient was terminated treatment due to vital signs instability, and the rate of recanalization was 93.3%. The NIHSS score of patients before treatment was 12.93±4.25, which was much higher than that after treatment (4.33±1.45, $P<0.05$). After follow-up by 3 months, the good mRS scores were obtained in all 18 patients, including 2 patients with mRS score of 2, 5 patients with 1, and 8 patients with 0. Additionally, there was no patient with re-obstruction during follow-up period. **Conclusion:** Mechanical thrombectomy with solitaire AB stents combined with intra-arterial thrombolysis had a good capability and safety in the treatment of patients with acute ischemic stroke.

Key words: Stroke; Cerebral ischemia; Solitaire AB stents; Mechanical thrombectomy; Intra-arterial thrombolysis

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前言

近年来,脑卒中的发病率、致死率已逐步攀升至全球第二

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位,逐渐成为威胁老年患者生活质量和生命健康的重要疾病之一,而急性缺血性脑卒中在所有脑卒中的占比可达 80%^[1]。颅内闭塞血管的再通是治疗急性缺血性脑卒中的关键^[2]。目前,动脉或静脉的药物溶栓是临床上治疗该疾病的常用方法,然而极易受到安全时间窗较短、并发症多等不良因素的干扰,并且血管的再通率也不尽如人意,往往难以取得满意疗效^[3]。溶栓治疗具有脑梗死区血流恢复快、保护神经功能等优点,可较好改善急性缺血性脑卒中患者的治疗效果及预后^[4]。本研究拟探究 Solitaire AB 支架取栓联合动脉溶栓治疗急性缺血性脑卒中的临床疗效。现作如下报道。

1 资料与方法

1.1 一般资料

收集 2014 年 8 月至 2016 年 8 月新疆维吾尔自治区职业病医院收治的 15 例急性缺血性脑卒中患者。其中,男性 11 例,女性 4 例,年龄 38~73 岁,平均(56.0±11.5)岁。入选标准:① 临床诊断为急性缺血性脑卒中;② 美国国立卫生研究院卒中量表评分(NIHSS)≥6 分;ASPECTS 评分≥6 分;③ 年龄≥18 岁;④ 发病时间≤4.5 h,且可在 6 h 内开始治疗;⑤ 由颈内动脉或近端大脑中动脉 M1 段闭塞引起的梗死。排除标准:① NIHSS 评分≥20 分者;② 颅内 MRI 或 CT 检查有脑出血或颅内其他疾病者;③ 治疗前舒张压≥110 mmHg 或收缩压≥180 mmHg 者。

1.2 治疗方法

患者采取平卧位,依据患者的病情选择全麻或局麻,使用改良 Seldinger 技术进行股动脉穿刺,置入 6F 导管鞘,常规肝素化,行全脑血管造影,观察血管病变部位及其侧支循环代偿情况。若发现血管重度狭窄或急性闭塞,则进行动脉内接触溶栓。用 0.035 超滑导丝引导 6F 指引导管到位,在路图下将 0.014 神经微导丝穿过重度狭窄或闭塞段动脉,在微导丝的引导下将取栓支架微导管的头端送至血栓远端,经微导管造影进行确认,明确血栓位置及长短,评估血管闭塞远端情况。首先经微导管团注 rt-PA 5 mg,回撤微导管并将头端保留在血栓中,给予 rt-PA 5-10 mg,用微量泵按每分钟 1 mg 经微导管泵入进行接触性溶栓,最后回撤微导管至血栓近端,继续经微量泵泵入 rt-PA 10-20 mg(rt-PA 总量一般不超过 30 mg)。每 10 min 复

查造影评估血管开通情况,若重度狭窄或闭塞段动脉仍未全通,则需进行支架取栓。首先将微导丝通过病变动脉,随后引导取栓支架导管通过病变动脉,经微导管行造影确认在动脉腔内,然后将 Solitaire AB 4 mm-20 mm 通过微导管进入病变血管中,释放支架并将支架留置在血栓区域,5 分钟后半回收支架并将微导管和支架一同回撤至指引导管内,最后一并撤出体外。随后,行脑血管造影评估病变血管开通情况,并对支架取出的血栓进行检查,若需要,可进行多次取栓,取栓后仍有严重残余狭窄者可根据病情行球囊扩张和支架植入治疗。最后,撤出指引导管和导管鞘,缝合手术部位,手术结束。术后给予患者营养支持、控制收缩压等辅助治疗,为防止再形成血栓,术后 24 小时开始给予氯吡格雷 75 mg/d(赛诺菲(杭州)制药有限公司,国药准字 J20130083),阿司匹林(拜耳医药保健有限公司,国药准字 J20130078)100 mg/d,口服 1 个月,后续改为长期服用阿司匹林 100 mg/d。另外,为防止因导管刺激引发血管痉挛,给予患者尼莫地平 6 mL/h(拜耳医药保健有限公司,国药准字 J20140105),持续进行 1~3 d。

1.3 疗效评价及随访

比较术前和出院时患者的 NIHSS 评分情况,并采用改良的 Rankin 评分(mRS)和哥拉斯加昏迷评分(GCS)评价患者的预后。术后 4 周复查头颅 CT+MRI+MRA。

1.4 统计学分析

采用 SPSS19.0 处理数据,计量资料以($\bar{x} \pm s$)表示,采用 t 检验,计数资料以(%)表示,行 χ^2 检验, $P < 0.05$ 为差异具有统计学意义。

2 结果

15 例患者通过 1~3 次动脉溶栓联合 Solitaire AB 取栓后,14 例患者均达到部分或完全再通,1 例患者(5 号病例)因生命体征不稳而终止取栓手术,再通率为 93.3%(14/15)。患者出院时 NIHSS 评分为 (4.33±1.45),显著低于术前的 (12.93±4.25),差异具有统计学意义($P < 0.05$)。15 例患者均通过 3 个月的术后随访,mRS 评分均显示良好,其中 2 例为 2 分,5 例为 1 分,8 例为 0 分。所有患者均为发生血管再闭塞等相关并发症。见表 1。

表 1 15 例急性缺血性脑卒中患者的治疗和预后情况

Table 1 The treatment and prognosis of 15 patients with acute ischemic stroke

Case	Gender	Age (year)	Vascular lesion	NIHSS score in preoperation	Pathogenic time (h)	Times of Thrombectomy (times)	Recanalization time (min)	NIHSS score in leaving hospital	mRS score in postoperation
1	F	62	Left middle cerebral artery	9	1.5	2	35	5	0
2	F	58	Right middle cerebral artery	8	2.0	1	42	4	1
3	F	43	Right middle cerebral artery and internal carotid artery	13	1.5	3	38	5	0
4	M	47	Basilar artery	16	3.5	3	51	5	0
5	F	72	Left middle cerebral artery	14	3.0	2	-	6	1
6	M	69	Left middle cerebral artery	12	2.5	2	57	3	0
7	F	42	Left internal carotid artery	11	4.0	1	53	3	2
8	M	38	Left middle cerebral artery and internal carotid artery	7	4.5	2	49	6	1

9	F	57	Left middle cerebral artery	15	3.5	2	37	6	0
10	F	55	Left vertebral artery	14	2.5	1	46	2	0
11	F	67	Left middle cerebral artery	20	1.5	2	44	6	0
12	M	69	Right vertebral artery	8	1.5	1	60	3	2
13	F	42	Left middle cerebral artery and internal carotid artery	21	3.0	3	59	4	1
14	F	49	Left middle cerebral artery	10	2.5	1	47	5	1
15	F	68	Basilar artery	16	3.5	2	64	2	0

Note: '-' showing the patients of ending thrombectomy as unstable vital signs.

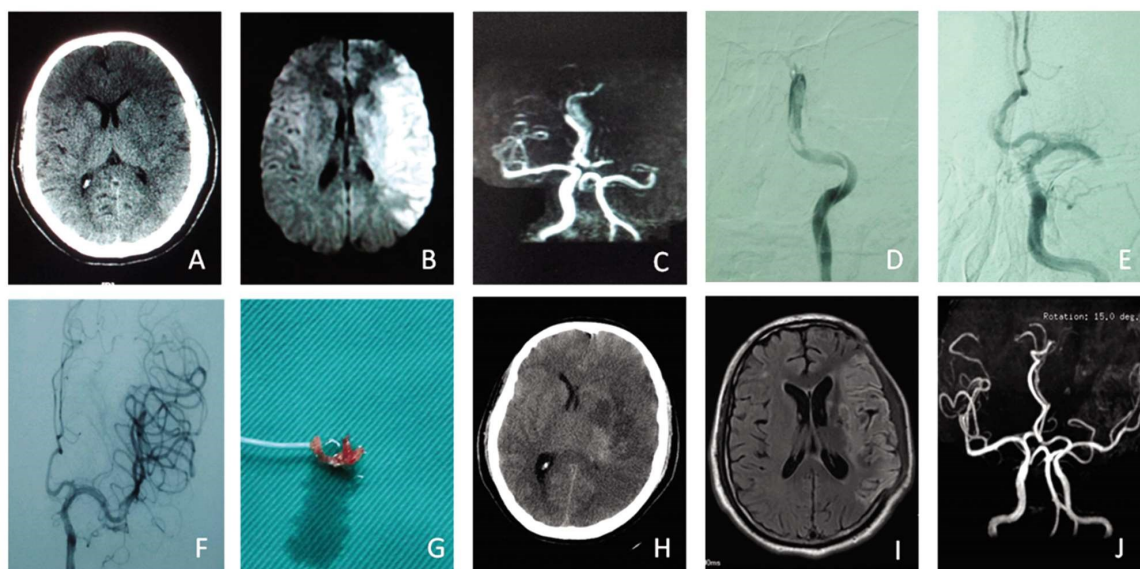


图 1 急性缺血性脑卒中患者治疗前后影像学资料

Fig.1 Imaging data of patients with acute ischemic stroke before and after treatment

A. No clear infarction lesions via postoperative CT examination; B. Diffusion image showing early ischemic manifestations of the left fronto parietal lobe via preoperative MRI scanning; C. Preoperative MRA with non-normal development left internal carotid artery and without effective collateral compensatory blood flow showing acute occlusion of the left internal carotid artery; D. Blockage of blood vessel through injecting Rt-PA 20 mg via micro-catheter to contact thrombolysis; E. Internal carotid artery was opened by thrombectomy and balloon dilatation, but the distal end of the vessel was embolized (right middle cerebral artery occlusion of the M1 segment), followed by a catheter pump of rt-PA 10 mg; F. The right internal carotid artery system was opened after stent thrombectomy + balloon dilatation and intra-arterial thrombolysis; G. The thrombus with removing Solitaire AB stent; H. The reexamining CT showing the the left hemisphere had malignant brain swelling in postoperative 2 d, and operating decompressive craniectomy in emergency room; I. The head MRI examination showed that the left temporal lobe cortex in postoperative 4 weeks; J. The MRA examination in postoperative 4 weeks showed that the blood vessels were well developed after the operation, and without residual stenosis and thrombosis.

典型病例(7号病例):男,42岁,以"突发意识不清"4h内入院,无既往特殊病史。2016年4月8日12时急性发病,查体:浅昏迷,躁动,无言语应答,刺痛可睁眼,患侧肢体瘫痪完全,健侧肢体可躲避,格拉斯哥昏迷(GCS)评分为7分,右巴氏征阳性。随即行头颅CT+MRI+MRA检查,提示"左侧额颞顶叶有早期缺血表现,左侧颈内动脉闭塞"(图1A-1C)。诊断为:脑梗塞超早期,左侧颈内动脉急性闭塞(无代偿血管),急行动脉溶栓联合 Solitaire AB 支架取栓,过程如图1D-1G所示。左侧颈内动脉造影证实:左侧颈内动脉C1段远端完全闭塞,考虑急性血栓形成。遂行经微导管给予接触性溶栓,首先给予rt-PA 5 mg 团注,接着用微量泵以1 mg/min 缓慢泵入,泵入rt-PA 10 mg 后复查造影显示治疗无效。遂行脑动脉血栓取栓术,取出少量血栓,复查造影显示左侧颈内动脉局部血管开通(C5近端血管),但左侧颈内动脉末端仍闭塞(C5段以远血管),考虑左侧颈内动脉末端局部血管动脉硬化并重度狭窄,遂局部给予2*15

mm 球囊扩张,后复查造影提示左侧颈内动脉、左侧大脑前动脉及左侧大脑中动脉起始部开通,但左侧大脑中动脉水平段远端发生闭塞(考虑碎血栓脱落导致急性栓塞),将微导管置入左侧大脑中动脉水平段给予接触性溶栓,泵入rt-PA 5 mg 后复查造影显示左侧大脑中动脉闭塞段开通,但局部血管壁毛糙、仍有明显狭窄,M2及远端血流正常,继续给予rt-PA 缓慢泵入,共计使用rt-PA 30 mg 后复查造影显示左侧大脑中动脉水平段局部狭窄较前明显好转,前向血流通畅。术后1d查体:意识较治疗前好转,昏睡状态,刺痛睁眼,无言语,可配合握手,GCS评分9分。患侧肢体刺痛可躲避、抬离床面。术后第2d,出现生命体征不稳定,意识障碍加重,神志昏迷,查体不配合,无言语应答,刺痛无睁眼,患侧肢体刺痛无反应,GCS评分4分,复查头部CT提示左侧大脑半球发生恶性脑肿胀,予急诊行去大骨瓣减压术和气管切开术(图1H)。去大骨瓣术后患者生命体征逐渐平稳。术后10天患者意识恢复,自动睁眼,无言语应答,可遵嘱

活动,GCS评分11分。术后17d,患者神志清,查体配合,言语模糊,患侧肢体恢复至3级,可抬离床面,GCS评分13分。术后20d后,患者恢复良好,可下地行走,正确回答问题,GCS评分15分。术后4周MRI:左侧颞叶皮层仍有广泛缺血灶(图1I)。术后4周MRA:左侧大脑中动脉皮层分支显影较对侧稀疏,左侧颈内动脉、大脑前动脉和大脑中动脉主干显影良好,血管开通区域无残余狭窄和血栓复发(图1J)。术后3个月,患者言语欠流畅,反应略慢,生活基本自理,拟行颅骨修复术。

3 讨论

缺血性脑卒中是临床上常见的神经科疾病,发病率和致残率逐年攀升^[5]。目前,溶栓药物的保守治疗仍是临床上治疗该疾病的主流方法,但安全时间窗较短、并发症多等不良因素以及血管的再通率一直困扰着广大医务从业者^[6]。对于缺血性脑卒中患者,有效及时的溶栓促使血液正常供应、促使脑梗死坏死区域及周边尚未凋亡细胞的功能逆转是治疗的关键^[7,8]。研究表明患者入院4.5h内静脉注入rt-PA或尿激酶可有效缓解或治疗急性缺血性脑卒中,但实验数据表明,静脉注入溶栓药物治疗的血管再通率仅为47%左右,效果并不理想^[9]。此外,单一采取动脉溶栓治疗的血管再通率也并不令人满意。因此,寻找一种有效、高再通率的治疗方法对于急性缺血性脑卒中患者具有极为重要的意义。

近年来,血管内机械取栓技术逐步进入人们的视野,其主要通过远端接触血栓并将其带入导管而取出血栓或近端采用真空抽吸的方式吸出血栓^[10,11]。目前,临床上比较常见的取栓支架为Solitaire AB型支架,其具有操作时间短、闭塞血管再通时间短等优点,可达到迅速恢复脑血流灌注,降低脑梗死面积^[12,13]。近年来,临床工作者对于Solitaire AB型支架取栓手术的安全性仍存在一定的争议。本次研究结果显示15例患者通过1~3次动脉溶栓联合Solitaire AB取栓后,有14例患者均达到部分或完全再通,1例患者因生命体征不稳而终止取栓手术,再通率为93.3%。该结果与Berkhemer等^[14]研究结果类似,也明显高于文献报道的单一动静脉溶栓的再通率,这也一定程度上证明了动脉溶栓联合Solitaire AB取栓利于缺血性脑卒中患者的治疗。此外,患者出院时NIHSS评分为(4.33±1.45),显著低于术前的(12.93±4.25),提示联合取栓治疗的急性缺血性脑卒中患者的神经功能显著改善。

急性缺血性脑卒中患者进行溶栓或血管内的治疗时容易发生脑内出血等相关并发症^[15,16],术中出血可能是由于取栓装置操作不当而导致血管壁损伤,而术后出血可能与溶栓药物、联合抗凝治疗以及再灌注损伤等多方面有关^[17-19]。在本次研究中,15例患者未出现脑内出血情况,这可能与本次研究例数较少,难以提供大规模实验样本有关。此外,陈然等^[20]研究表明发病时间过长而超过时间窗的患者更容易发生脑内出血,本次研究收集的患者均为发病4.5h内的急性缺血性脑卒中,这可能一定程度上降低了脑出血等并发症的发生风险。

综上所述,Solitaire AB支架取栓联合动脉溶栓治疗急性缺血性脑卒中的临床效果良好,安全性高。而本次研究为回顾性研究分析,且研究例数较少,加之随访时间仅为3个月,可能难以提供极为有利的研究依据。因此,仍需要进一步加大样本

量、延长随访时间为临床上急性缺血性脑卒中的治疗提供理论依据。

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