doi:10.11659/jjssx.01E017056

·临床研究·

血管内支架成形术治疗颅外段颈内动脉夹层的疗效分析

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[摘 要] **目的** 探讨血管内支架成形术治疗颅外段颈内动脉夹层(ICAD)的临床效果。**方法** 回顾性分析我院2015年7月至2016年12月收治的25例颅外段ICAD患者的临床资料,其中15例表现为头颈痛,12例出现短暂性脑缺血或者脑梗死表现(肢体偏瘫等),6例伴有Horner综合征,1例以搏动性耳鸣、晕厥首发,2例无明显临床症状,颈部血管超声偶然发现。25例ICAD患者均行血管内支架成形术治疗,通过数字减影血管造影(DSA)计算狭窄程度、经颅多普勒(TCD)测量血流速度以及观察患者临床表现,6个月后随访复查。**结果** 25例ICAD患者中24例血管内支架成形术顺利完成,未出现内膜损伤、出血、栓塞等并发症,1例血管走形迂曲,放弃支架置入;DSA显示平均动脉狭窄程度由术前的(76.70±10.57)%降至术后(即刻)的(11.07±4.18)%,差异有统计学意义($P<0.01$);TCD测量颈内动脉狭窄段收缩峰值流速(PSV)由术前平均(189.55±54.27) cm/s降至术后(1周)平均(88.41±17.06)cm/s,差异有统计学意义($P<0.01$);6个月后复查头颈部CT血管造影(CTA),与术后即刻比较,23例未见新的狭窄形成,1例出现支架内再狭窄;19例症状明显缓解或消失,4例部分缓解,1例复发,未出现梗死及其他严重并发症。**结论** 血管内支架成形术是治疗颅外段ICAD相对安全、有效的方法,能有效改善狭窄程度、血流状况以及临床症状,且近期复发率低,不良反应较少,但不适用于血管严重迂曲患者。

[关键词] 血管内支架成形术;颈内动脉夹层;脑缺血事件;血管迂曲

[中图分类号] R459.9 [文献标识码] A [收稿日期] 2017-01-15

Curative effect analysis of intravascular stent angioplasty for extracranial internal carotid artery dissection

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Abstract: Objective To explore the clinic effect of intravascular stent angioplasty for extracranial internal carotid artery dissection (ICAD). **Methods** From July 2015 to December 2016, 25 cases of patients with extracranial ICAD were admitted into our hospital. Among them, there were 15 cases of head and neck pain, 12 cases with transient ischemic or cerebral infarction symptoms (limb hemiplegia. etc.), 6 cases of Horner syndrome, 1 case with pulsatile tinnitus and syncope, 2 cases with no obvious clinical symptoms which were found by the neck vascular ultrasound accidentally. All patients were treated with intravascular stent angioplasty. Calculated the degree of stenosis through digital subtraction angiography (DSA), measured the blood flow velocity with transcranial doppler (TCD), and observed the clinical manifestations. Reviewed those patients after six months. **Results** Totally 24 patients with ICAD fulfilled the intravascular stent angioplasty with no complications such as lining damage, bleeding and embolism. And one patient with ICAD abandoned intravascular stent angioplasty for the vascular is too circuity. DSA showed the average artery stenosis decreased from (76.70±10.57)% preoperatively to (11.07±4.18)% immediately after operation, and the difference was statistically significant ($P<0.01$). TCD measured the peak systolic velocity (PSV) of internal carotid artery stenosis segment, and the PSV changed from (189.55±54.27) cm/s averagely before operation to (88.41±17.06) cm/s on average one week after operation. The difference was statistically significant ($P<0.01$). Reviewed the head and neck CT angiography (CTA) after 6 months. There were 23 cases without new stenosis and 1 case had stent restenosis compared with CTA immediately after operation. Symptoms of 19 cases obviously remitted or disappeared, 4 cases partially remitted, and recurrence occured in 1 patient. There was no appearance of infarction and other serious complications. **Conclusion** The intravascular stent angioplasty is relatively safe and effective for extracranial ICAD, which can remit the degree of stenosis, slow down the blood flow and relieve the clinical symptoms with low recent recurrence rate and adverse reaction. But it does not apply to patients with severe vascular circuity.

Keywords: intravascular stent angioplasty; internal carotid artery dissection; ischemic; vascular circuity

缺血性脑卒中在我国具有较高的发病率及病死率,颅外段颈内动脉夹层(internal carotid artery dissection,ICAD)导致的血管狭窄是缺血性脑卒中的主要诱发因素之一[1]。ICAD主要选用抗凝药物及抗血小板药物治疗,但有部分患者对抗凝及抗血小板聚集治疗反应较差,不能抑制血管狭窄进程及缓解临床症状[2]。血管内支架成形术通过介入方法在血管内置入支架,对扩张狭窄血管疗效独特,且逐渐得到国内外卒中防治指南的认可[3],但其临床疗效有待进一步验证。本文回顾性分析我院2015年7月至2016年12

月行血管内支架成形术的颅外段 ICAD 患者的临床资料,对手术效果及短期满意度进行评价。

1 资料与方法

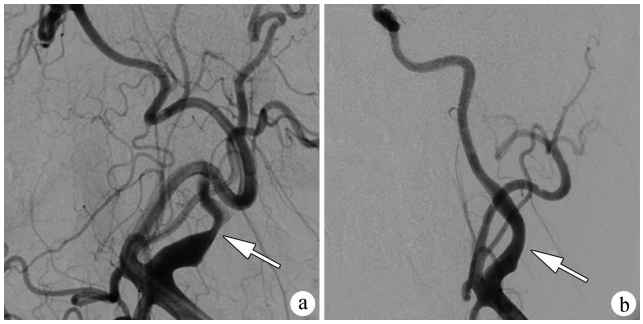
1.1 临床资料

2015 年 7 月至 2016 年 12 月我院 25 例颅外段 ICAD 患者进行血管内支架成形术治疗。其中男 14 例,女 11 例,男女比例 1.27∶1,年龄 35 ~ 51 岁,平均(43.08 ± 4.67)岁。22 例为单侧 ICAD,3 例双侧同时发病。15 例表现为头痛或颈部痛,波及同侧眼眶周围、耳廓旁,且头痛通常为突发性;12 例出现短暂性脑缺血或者脑梗死表现;6 例伴有 Horner 综合征;1 例以搏动性耳鸣、晕厥首发;2 例无明显临床症状,颈部血管超声偶然发现。6 例有高血压史,3 例有糖尿病史,8 例有吸烟史。头颈部 CTA 显示颈内动脉颅外段管腔狭窄,可见鼠尾征、线样征、双腔征,部分可见软斑形成;经颅多普勒(transcranial doppler,TCD)检查颈内动脉狭窄段收缩峰值流速(peak systolic velocity,PSV)平均为(189.55 ± 54.27)cm/s。所有患者均给予内科治疗,但效果欠佳。

纳入标准:①临床符合颅外段 ICAD 的特点,如头或颈部突发性疼痛、脑梗死症状、短暂性脑缺血、Horner 综合征、晕厥等;②DSA 确诊为颅外段 ICAD 且出现管腔狭窄(狭窄大于 70%,如为溃疡斑块则大于 50%);③已使用抗凝药物治疗 7 d,但效果欠佳,患者症状无好转或出现加重;④符合介入治疗的条件。排除标准:①有严重心、肺以及肾等功能障碍;②伴有凝血异常或者血小板减少,出血倾向大;③对造影剂产生过敏反应;④患者不愿意接受介入治疗。

1.2 方法

术前 3 d 嘱患者口服双联抗血小板聚集药以及降血脂降胆固醇药,阿司匹林 100 mg、氯吡格雷 75 mg,阿托伐他汀钙片 40 mg,每日 1 次,普罗布考片 0.5 g,每日 2 次。术前 6 h 禁食禁水。术中全程心电监护,备皮消毒完成后局部麻醉,采用 Seldinger 技术右侧股动脉穿刺后行颈内动脉及脑血管造影,明确夹层部位、范围及脑血流循环状况,插入 8 F 动脉鞘组,静脉团注 80 u/kg 肝素钠。有 3 例患者由于狭窄程度严重,进行了球囊扩张术。在导丝引导下将脑保护伞送至颈内动脉夹层远端,通过微导丝将支架送至病变血管处,造影显示支架定位准确后,缓慢释放支架,显示支架展开良好,狭窄血管明显改善(图 1),后退出支架输送系统。术后平卧,动脉压迫止血器压迫穿刺点,心电监护 24 h,注意观察神经系统相关症状,并服用硫酸氢氯吡格雷片(3 个月)及阿司匹林肠溶片(长期),阿托伐他汀钙片(长期),普罗布考片(3 个月)。



a:血管内支架成形术术前全脑血管造影检查显示左侧颈内动脉 C_1 ~ C_4 段夹层合并狭窄形成;b:左侧颈动脉窦部至 C_4 段支架植入术后全脑血管造影检查显示左侧颈内动脉血流通畅

图 1 血管内支架成形术前后全脑血管造影检查所见

1.3 统计学分析

使用 SPSS 13.0 进行统计学分析,计量资料进行正态性分析后作 student t 检验(术前与术后),比较血管狭窄程度与 PSV,以均数 ± 标准差($\bar{x} \pm s$)表示,检验水准 α 取 0.01。以 $P < 0.01$ 为差异有统计学意义。

2 结果

2.1 手术情况

24 例颅外段 ICAD 患者成功手术,手术成功率 96%,造影显示血管内支架展开良好,血流通畅,血管狭窄明显改善,颈内动脉平均狭窄程度由术前的(76.70 ± 10.57)% 降至术后(即刻)的(11.07 ± 4.18)%,术中 3 例出现一过性血压增高,1 例发生短暂性抽搐,经相应处理后恢复,未发生脑出血及梗死;1 例患者因颈内动脉严重迂曲,路径太差,脑保护伞及支架无法顺利通过,遂放弃支架置入治疗。

2.2 术后随访

术后 1 周行 TCD 测量颈内动脉狭窄段 PSV,平均为(88.41 ± 17.06)cm/s,与术前平均(189.55 ± 54.27)cm/s 比较,差异有统计学意义($P < 0.01$)。6 个月后复查头颈部 CTA,与术前相比,23 例未见新的狭窄形成,1 例出现支架内再狭窄(8.3%);19 例症状明显缓解或消失,无头颈部疼痛,短暂性脑缺血及 Horner 综合征等症状出现,3 例部分缓解,头痛减轻,偶发头晕、耳鸣,1 例出现短暂性脑缺血、头晕及痛,未出现梗死及其他严重并发症。

3 讨论

ICAD 发病率约为 3/100 000[4],平均发病年龄 40 ~ 46岁,但儿童也常见,且没有性别差异,双侧颈内

动脉发病率在9% ~21%[5-6]。本组病例发病平均年龄为43岁,3例为双侧ICAD(12%),无儿童病例,男性患者稍多于女性。动脉夹层是由于血液通过动脉内膜裂口进入血管壁引起,末梢动脉少见[7]。血管内膜下血肿可引起血管腔缩小甚至闭塞。若血液侵入蛛网膜,膨大的血肿可能会引起蛛网膜出血[8]。动脉夹层常常引起血管管腔狭窄,进而引发血流动力学的改变或者血管壁的损伤导致栓塞。而ICAD导致的管腔狭窄也是血管内支架成形术的主要适应证。ICAD暂无明确病因发现。轻微的头痛或者缺血、身体应激(咳嗽、呕吐、生长发育、颈椎按摩、颈部活动或者伸张过猛等)以及生育均能引起ICAD[9]。

ICAD最常见的症状为头痛或者颈部痛,通常是突发性疼痛,且位置变化较大。头痛可为轻微、广泛的双侧痛;其次症状为脑或视网膜缺血[10]。脑缺血事件(短暂性脑缺血或中风)通常是迟发,可见于夹层发生后1个月[11]。Horner综合伴疼痛是ICAD典型表现,其他少见症状包括发病同侧的主观感觉噪音、搏动性耳鸣、头皮压痛、颈部肿胀、味觉障碍、失明以及继发于眼动脉闭塞的眶周缺血综合征(视区缺损、眼肌瘫痪、眼结膜水肿)。这些症状可单独发生,也可同时发生。通常都是夹层同侧头痛以及Horner综合征可伴随迟发性局部脑缺血,超过50%患者会出现上诉三联征[12]。本组病例中多数表现为头颈疼痛,短暂性脑缺血及Horner综合征也较多,1例听觉受损出现耳鸣。

ICAD诊断主要依靠是DSA,典型表现是呈现不规则的锥形狭窄,常称为“线性征”或“鼠尾征”。狭窄处通常在动脉分支后端2~3 cm、向颅底延伸[13]。也有夹层可向颈动脉延伸,波及颅内血管;其他表现包括锥形、火焰型闭塞或者动脉瘤样膨胀。不规则的动脉壁有时是唯一表现;11% ~15%患者出现微端分支血管闭塞;不超过4%的患者可出现双腔表现,此为诊断金标准[14]。出现不同造影表现更可能是因为其再通过程而不是其类型。CTA检查创伤小且速度快,是年老体弱及危重患者以及DSA术前筛查的首选。而且其对ICAD的敏感性也比较高[15]。ICAD在超声无特征性表现。ICAD在超声直接观察到的是逐渐变细的血管。但没有诸如狭窄、阻塞等常见征象。TCD对ICAD患者颅内血流的急剧改变很有价值,因其能区别血流的中断是栓塞还是流速导致、高度狭窄导致的颈内动脉闭塞是由大脑中动脉的血流过慢或者Willis环血流过快导致[16]。

关于ICAD的治疗,抗凝疗法比较广泛。抗凝的主要作用是防止脑血管栓塞以及小动脉闭塞[17]。近期研究表明ICAD引发的脑梗更多的是栓子引起,而不是血流动力学改变[18]。一旦发生脑梗塞,出血的发生概率就会大增,这时抗凝药还会起反作用。抗凝药的一大风险就是引起管壁血肿,但目前还没找到证据支持。抗凝药还可能抑制假腔的修复。若永久性阻塞已形成,继续使用抗凝药则没有更大的意义[19]。抗血小板治疗亦无确切数据。考虑到降低风险以及预防中风,在抗凝药无法使用的情况下,阿司匹林是不错的选择。使用抗血小板药物时需考虑个体因素。对于抗凝药治疗不敏感、有抗凝药物治疗禁忌或者血管腔完全闭塞的患者,血管内支架置入术就显得不可替代。

血管内支架成形术相当于一种物理疗法,机械性的扩张狭窄血管内径,恢复血流。在局部麻醉下即可实施,且对颈内动脉血流阻断时间较少,对脑部血供不会产生严重影响[20]。局限性在于对血管走形迂曲者导管导丝很难通过,操作实施难度大。在置入支架前,应在预置入支架远端放入脑保护伞,可防止脱落的斑块及血栓进入头部引发梗塞[21]。本文中24例患者取出的脑保护伞均未见脱落的斑块、血栓,可能是破裂处的血管内皮细胞修复后与管壁形成了纤维粘连。但脑保护伞的作用仍然不可忽略。部分患者由于血管狭窄程度大,脑保护伞及支架无法顺利通过,需在置入前预先使用球囊扩张术扩大血管内径,但球囊扩张会引起血液阻断时间延长,而且会增大狭窄段管壁内斑块脱落以及动脉内膜撕裂的风险,固在支架能够通过的情况下尽量避免使用球囊扩张[22]。

支架成形术对于夹层导致的颈内动脉狭窄疗效显著,本文24例成功置入支架的患者颈内动脉平均狭窄程度明显改善,TCD也证实了狭窄段的PSV改善明显。本组患者中有24例手术顺利进行,术中3例出现血压增高,1例发生短暂性抽搐,但均很快恢复,未发生严重并发症,术后6个月有1例出现支架内再狭窄,均未见血栓形成及支架移位。血管内支架成形术的操作应尽量简洁、快速,造影确定夹层位置后再放支架,争取一次到位,避免在狭窄部位反复调整位置引起狭窄段动脉壁斑块的脱落[23]。手术过程中应常备肝素,避免导管及导丝内血栓的形成。术后也应给予抗凝及抗血小板药物作为预防[24]。

综上所述,血管内支架成形术是治疗颅外段ICAD安全有效的措施,经DSA、TCD、CTA及临床表现对比证实其术后近期疗效良好,不良反应少,能有效改善血管狭窄程度、血流状况以及患者临床症状,且近期复发率较低。

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(编辑:左艳芳)