

颈动脉内膜斑块剥脱术后缺血性脑卒中的防治

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【摘要】目的 探讨颈动脉内膜斑块剥脱术后缺血性脑卒中的防治方法。方法 回顾性分析 2016 年 5 月至 2019 年 11 月颈动脉内膜斑块剥脱术治疗的 70 例颈动脉狭窄的临床资料。术前行颈动脉彩色多普勒超声、头颈部血管 CTA 或 DSA 检查,术中严格落实各项卒中预防措施,包括平稳控制血压,轻柔精细操作,顺序解剖、阻断、开放各血管,仔细清理斑块、内膜远端固定、严密缝合,返流压、体感诱发电位联合监测等。结果 2 例(2.86%)术后出现脑缺血事件。无心肌梗死、手术死亡病例。术后随访 3~30 个月,所有病人血管通畅、无狭窄,恢复良好。结论 轻柔精准操作、平稳控制血压、多项目监测等对防治颈动脉内膜斑块剥脱术后缺血性脑卒中有重要意义。

【关键词】颈动脉内膜斑块剥脱术;缺血性脑卒中;防治方法

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Prevention of postoperative ischemic stroke in patients undergoing carotid endarterectomy

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【Abstract】Objective To investigate the methods to prevent postoperative ischemic stroke in the patients undergoing carotid endarterectomy (CEA). Methods The clinical data of 70 patients who underwent CEA from May 2016 to November 2019 were analyzed retrospectively. The carotid ultrasonography, CTA or DSA were performed in all the patients before the operation. Stroke prevention measures were strictly implemented during the operation, including controlling the blood pressure smoothly, operating gently and delicately, sequential dissection, blocking, and opening of the blood vessels, injecting heparin and flushing the operation area with diluted heparin, cleaning the plaque carefully, fixing the distal end of intima, tightly sewing the patch, and using monitoring of stump pressure and somatosensory evoked potential and so on. Results All the surgeries were successful. Ischemic stroke occurred in 2 patients (2.86%) after the operation. There was no postoperative cardiac infarction or death. The follow-up (range, 3~30 months) results showed that all the patients were recovered well and the carotid artery patencies without stenoses were preserved in all the patients. Conclusions Gentle and precise operation, stable control of blood pressure and multi-modal monitoring during the operation are of great significance to the prevention of postoperative ischemic stroke in the patients undergoing CEA.

【Key words】Carotid endarterectomy; Postoperative ischemic stroke; Prevention

颈动脉内膜斑块剥脱术(carotid endarterectomy, CEA)在脑卒中的防治中具有重要作用<sup>[1-5]</sup>。但是,CEA 后仍有可能发生脑卒中<sup>[6]</sup>。如何降低 CEA 后脑卒中发生几率,是临床关注的重要问题。2016 年 5 月至 2019 年 11 月采用 CEA 治疗重度颈动脉狭窄 70 例,术后恢复良好,本文对其临床资料进行回顾分析,总结预防术后缺血性脑卒中的经验。

1 资料与方法

1.1 一般资料 70 例中,男 65 例,女 5 例;年龄 50~78 岁,平均 68.5 岁;单纯脑梗死 62 例,单纯眼黑蒙 1 例,脑梗死合并同侧眼黑蒙 1 例,无症状 6 例;伴高血压

68 例、糖尿病 8 例、糖尿病和鼻咽癌 1 例、高脂血症 23 例;口服他汀类药物 60 例;有长期吸烟史 30 例。

1.2 治疗方法

1.2.1 术前准备 术前均完善颈动脉彩色多普勒超声及头颈部血管 CTA 或 DSA 检查,明确血管狭窄程度及斑块特点,同时评估颅内前后交通动脉代偿情况以及对侧颈动脉狭窄程度;采用经颅彩色多普勒超声测定双侧大脑中动脉流速,脑组织 CT 灌注成像评估术后出现过度灌注综合征的风险;完善 24 h 动态血压监测、心脏彩色多普勒超声、肺部 CT、肺功能等检查,行血常规、凝血功能、血小板活化、血脂、肝肾功能等常规生化检查;术前抗血小板药物拜阿司匹林继续服用,硫酸氢氯吡格雷则停用 1 周以上,强化他汀类药物稳定斑块。

1.2.2 手术方法 均行气管插管、全身麻醉。取仰卧位,肩部垫高,头适度后仰偏向对侧。取胸锁乳突肌

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前缘斜行切口,长 5~7 cm,以颈动脉分叉为中心。切开皮肤、皮下组织及颈阔肌,沿胸锁乳突肌前缘锐性分离至颈动脉鞘,解剖完颈总动脉(common carotid artery, CCA)、颈外动脉(external carotid artery, ECA)及颈内动脉(internal carotid artery, ICA)正常远端,全身肝素化,依次阻断 ICA、CCA、ECA,进一步解剖颈动脉分叉。标记 ICA 至 CCA 血管壁外侧直切口,尖刀及Pork剪剪开,仔细分离斑块,ICA内膜残端钉缝固定,选择适当大小血管补片缝合血管,然后依次开放 ECA、CCA 及 ICA。头颈适当回位,仔细止血后切口放置负压引流,全层缝合颈部皮肤、颈阔肌。

**1.2.3 术后处理** 术后常规复查头部 CT,保留气管插管 24 h,仰卧位,床头抬高 30°,床边备气管切开包 72 h。控制血压低于基础血压 15%~20%,监测大脑中动脉流速,如较术前增加超过 100%,则考虑给予甘露醇减容、同时适当降低血压;术后 24~48 h 开始服用抗血小板药物,单一拜阿司匹林或联合硫酸氢氯吡格雷双抗;其它降血压、降血脂等基础疾病用药术后 24 h 恢复进食后常规服用。拔除引流管后,即复查头颈部血管 CTA,术后 1、3 个月复查颈部血管彩色多普勒超声,术后 6 个月复查头颈部 CTA 及脑 CT 灌注检查。

## 2 结果

70 例中,68 例术后无缺血性脑血管事件,1 例出现短暂性脑缺血发作后 4 h 内恢复,1 例脑梗死后 2 周恢复。无心肌梗死、手术死亡。术后随访 3~30 个月,所有病人血管通畅无狭窄,恢复良好。

## 3 讨论

研究指出,提高手术技巧及熟练掌握各种调控措施,能够降低 CEA 后缺血性脑卒中的发生率<sup>[7]</sup>。本文病例围手术期缺血性脑卒中发生率为 2.8%,低于国家卫健委脑卒中预防委员会 CEA 指南要求的发生率。

**3.1 轻柔锐性原位解剖血管** CEA 的主要目的是切除斑块、解除血管狭窄,防止斑块脱落及再狭窄。术后卒中多归因于微小斑块的脱落<sup>[8]</sup>,因此,术中需轻柔操作、锐性解剖,尽量减少血管及血管鞘的牵拉,保证血管位于解剖原位。为了准确定位颈动脉分叉及斑块位置,术前行彩色多普勒超声检查并标记,术者与超声技师沟通,做到对血管及斑块形态、走形了然于胸,同时需充分了解对侧颈动脉及椎-基底动脉狭窄程度<sup>[9,10]</sup>。亚洲人的颈动脉分叉普

遍相对较高,影响手术暴露,术前行鼻插管和/或下颌关节半脱位,减少下颌角的遮挡。颈动脉分叉处颈动脉鞘与血管相对粘连紧密,且斑块主体多位于颈动脉分叉,因此,建议先解剖颈内动脉远端相对正常段预留出阻断位置,分别阻断 ICA、CCA 及 ECA 后,再充分解剖颈动脉分叉。

**3.2 按序阻断血管、仔细分离切除斑块并处理好血管内膜** 大多学者先阻断 ICA 远端、后阻断 CCA、再阻断 ECA,部分学者先阻断 CCA、后阻断 ICA、再阻断 ECA。虽然阻断顺序不一样,但 ECA 均最后阻断。为了预防阻断钳夹斑块后斑块脱落进入颅内,我们一般先阻断 ICA。血管切开前可用无菌划线笔在血管表面标记切口,用尖刀切开血管以后,先后用小、大Pork剪(鸟嘴剪)直线切开,可避免缝合后血管扭曲。斑块剥离前找到与中膜的界限,必要时可用放大镜或显微镜分清层次,斑块在各血管处残端修剪整齐,ICA 内膜残端尤其需注意,最好用 7-0 Prolene 缝线固定内膜,线结须打在血管外膜面;血管腔内须用专用圈镊摘除斑块碎片,分叉处斑块往往与中膜外膜粘连紧密,需小心分离,防止过多剥离导致血管壁过薄。在斑块剥离完毕、内膜残端固定后,临时松开各阻断钳,利用血流冲洗斑块碎屑。

**3.3 连续外翻严密缝合血管** 不管是补片式、外翻式还是显微原位缝合,必须保证血管为外翻缝合,使血管腔内光滑,防止血栓形成,同时要注意保持针距和边距均一,保证血管平滑的形态。在使用补片缝合血管时,做到每一针均为内膜进、外膜出,减少外膜纤维被带入血管腔的风险。使用血管补片缝合血管时,颈内动脉远心端可能会被下颌角遮挡,可以采用“降落伞”技术保证严密缝合。当血管缝合至最后 2~3 针时,建议松开 ICA 临时阻断钳,使血管在充盈状态下完成缝合,最大限度地减少斑块碎屑及空气栓子。按顺序打开 ECA、CCA 和 ICA,ICA 缓慢打开,有条件监测同侧大脑中动脉流速,预防过度灌注。

**3.4 血压控制** CEA 中控制血压非常重要。血压过低,可能导致脑灌注不足,引起脑组织和其他器官缺血<sup>[11]</sup>;血压过高,可能导致脑灌注压突破致脑出血,同时心脏后负荷过高也可能导致心脏功能不全。术前行 24 h 动态血压监测,了解血压最高、最低水平及平均血压,有助于术中血压控制。本文病例,在麻醉诱导期间外周血压波动幅度控制在基础血压的 15%~20%<sup>[12]</sup>。文献报道血压超过 150 mmHg,脑灌注明显增加,因此,阻断颈动脉之前,嘱麻醉师将外周收缩压升高至 150~160 mmHg,一般用多巴胺或者麻黄

素;在血管缝合完毕后、开通之前,嘱麻醉师将收缩压降低 15%,至 120 mmHg 左右,在麻醉恢复期间及回归病房后均维持血压在该水平。

3.5 术中监测 目前,CEA 监测项目包括脑电图、体感诱发电位<sup>[13]</sup>、运动诱发电位、残端压、脑血氧监测<sup>[14]</sup>、经颅彩色多普勒超声、局麻监测语言及肢体活动等,虽然没有哪一种监测方法能完全预测脑缺血事件,但联合两种以上的监测方法有助于预防脑缺血事件<sup>[15]</sup>。本文病例联合监测体感诱发电位和残端压,3 例术中出现残端压>25 mmHg,阻断 30 min 后对侧体感诱发电位波幅下降超过 50%,通过升高血压,快速缝合,其中 2 例在开通 20 min 后恢复正常;1 例血压和心率控制欠佳,复通后也没有恢复,术后出现同侧多发脑梗死,考虑与压力感受器受损、血压波动有关,经过调整血压、康复理疗 2 周恢复生活自理。

综上所述,提高手术操作技巧,平稳控制血压,并联合使用残端压、体感诱发电位等监测手段,对降低 CEA 后缺血性脑血管事件有非常重要的意义。

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