

. 个案报道 .

椎动脉远端发育异常伴基底动脉开窗畸形合并相关动脉瘤 1 例

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【摘要】 椎动脉远端发育异常临床不少见,但伴基底动脉开窗畸形的病人并不多见,合并相关动脉瘤更是罕见。本文报道 1 例椎动脉远端发育异常伴基底动脉开窗畸形合并相关动脉瘤,为 50 岁女性,因突发头痛 14 h 入院;入院 Hunt-Hess 评分 II 级;急诊颅脑 CTA 显示蛛网膜下腔出血,基底动脉开窗畸形;右侧椎动脉造影见基底动脉开窗畸形合并动脉瘤,动脉瘤大小约 2.6 mm×2.7 mm,瘤颈约 2.8 mm。行支架辅助下颅内动脉瘤栓塞术,术后即刻造影显示动脉瘤完全栓塞,载瘤血管通畅,开窗通道显影良好;术后 12 个月复查 DSA 未见动脉瘤复发,原有开窗通道未显影;无新发脑出血、脑梗塞,无神经功能缺损。临床上,椎动脉远端发育异常伴基底动脉开窗畸形合并相关动脉瘤临床罕见,诊断推荐 DSA,建议采用血管内治疗,应注意保护分支血管、尽量保护开窗环;使用支架辅助栓塞治疗可能增加缺血事件风险,应注意预防。

【关键词】 椎动脉远端发育异常;基底动脉开窗畸形;颅内动脉瘤;血管内治疗

【文章编号】 1009-153X(2024)10-0633-02

【文献标志码】 B

【中国图书资料分类号】 R 743

One case of distal vertebral artery dysplasia associated with basilar artery fenestration malformation and related aneurysm

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【Abstract】 Distal developmental abnormalities of the vertebral artery are not uncommon in clinic; however, these patients with basilar artery fenestration malformations are rare, and those with associated aneurysms are even rarer. This article reports a case of a 50-year-old female who was admitted to hospital due to sudden headache for 14 hours; the Hunt-Hess score upon admission was grade II; emergency cranial CTA revealed subarachnoid hemorrhage and basilar artery fenestration malformation; right vertebral artery angiography showed basilar artery fenestration malformation with an aneurysm, approximately 2.6 mm × 2.7 mm in size, and the aneurysm neck was about 2.8 mm. Stent-assisted embolization of the intracranial aneurysm was performed. Immediate angiography after the operation showed complete embolization of the aneurysm, patency of the parent artery, and good visualization of the fenestration channel; at the 12-month follow-up DSA, no recurrence of the aneurysm was observed, and the original fenestration channel was not visualized; there was no new cerebral hemorrhage, cerebral infarction, or neurological deficits. Clinically, the combination of distal developmental abnormalities of the vertebral artery, basilar artery fenestration malformation, and associated aneurysms is extremely rare. DSA is recommended for diagnosis, and endovascular treatment is suggested. Attention should be paid to protecting branch vessels and the fenestration ring as much as possible; the use of stent-assisted embolization may increase the risk of ischemic events, and precautions should be taken.

【Key words】 Distal developmental anomaly of the vertebral artery; Fenestration malformation of the basilar artery; Intracranial aneurysm; Endovascular therapy

1 病例资料

50 岁女性,因突发头痛 14 h 于 2018 年 2 月 15 日入院。入院体格检查:神志清楚,GCS 评分 15 分;Hunt-Hess 分级 II 级;双侧瞳孔等大、等圆,直径约 3 mm,对光反射存在;颈强直,四肢肌力 V 级、肌张力正常。急诊颅脑 CTA 显示蛛网膜下腔出血,基底动脉开窗畸形(图 1A、1B)。拟局麻行颅脑 DSA 进一步明确诊断。采用 Seldinger 技术穿刺右侧股动脉,置入 6F 鞘,用 5F 单弯行双侧颈内动脉、椎动脉造影显示双侧颈内动脉造影未见明显异常;左侧椎动脉细小,基底动脉未显影,同侧小脑后下动脉显影良好;右侧椎动脉造影见基底

动脉开窗畸形合并动脉瘤,动脉瘤大小约 2.6 mm×2.7 mm,瘤颈约 2.8 mm(图 1C、1D)。拟行支架辅助下颅内动脉瘤栓塞术,顿服阿司匹林 300 mg、氯吡格雷 300 mg。气管插管全麻后,选择合适工作角度,6F 导引导管置于右侧椎动脉 C1 水平,Echelon-10 微导管尖端塑形后微导丝引导下到位动脉瘤腔,Headway 支架导管到位后,采用支架半释放技术,先后向动脉瘤内放入 2.5 mm×3.5 cm(3D)、1 mm×3 cm、1.5 mm×1 cm 弹簧圈共 3 枚,释放支架(LVIS 支架,图 1E),造影见动脉瘤完全栓塞,载瘤血管通畅,开窗通道显影良好(图 1F)。术后予甘露醇脱水、尼莫地平预防血管痉挛等对症治疗,口服阿司匹林+氯吡格雷抗血小板治疗。术后复查颅脑 CT 未见新发脑出血、脑梗塞,行腰椎穿刺术释放血性脑脊液,术后 7 d 恢复良好出院(GOS 评分 5 分)。术后阿司匹林 100 mg/d+氯吡格雷 75 mg/d 同服 3 个月,3 个月后改阿司匹林 100 mg/d,术后 12 个月复查颅脑 DSA 未见动脉瘤复发,原有开窗通道未显影(图 1G、1H);无新发脑出血、脑梗塞,无神经功能缺损。

doi:10.13798/j.issn.1009-153X.2024.10.014

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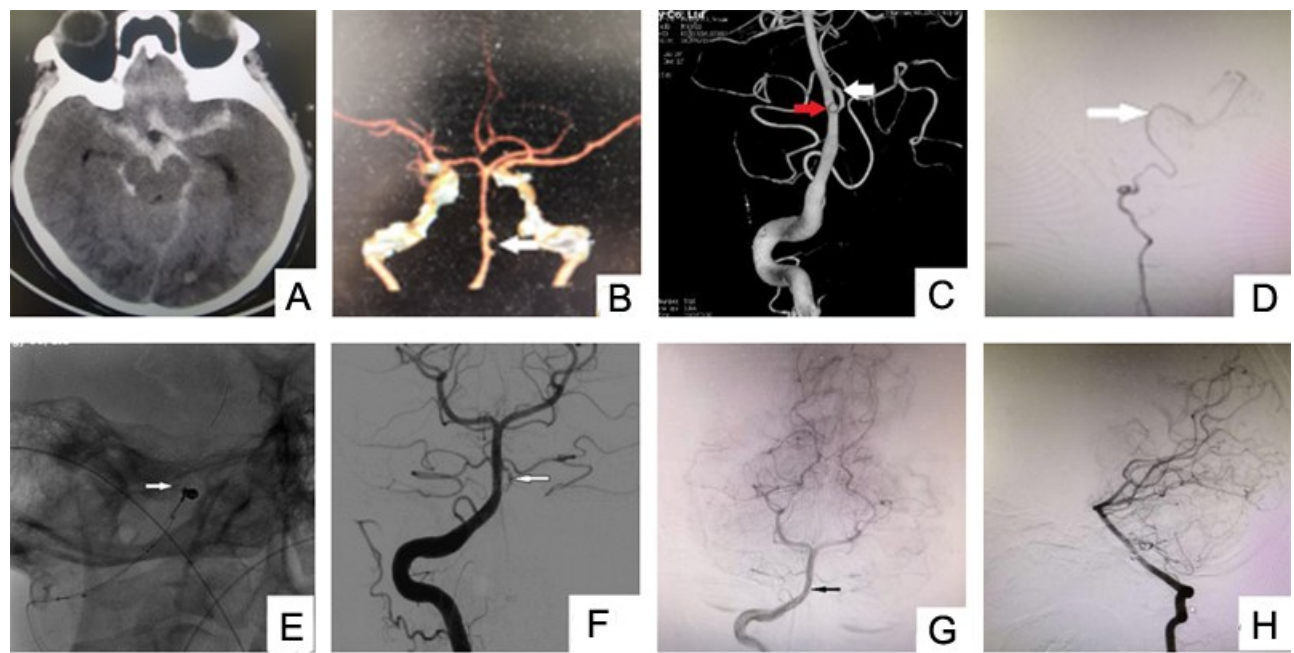


图1 椎动脉远端发育异常伴基底动脉开窗畸形合并相关动脉瘤行支架辅助栓塞术前术后影像
A. 术前颅脑CT示蛛网膜下腔出血;B. 术前颅脑CTA显影不佳,考虑基底动脉开窗畸形(↑示);C. 右侧椎动脉3D-DSA示基底动脉开窗畸形(白色↑示)合并动脉瘤(红色↑示),双侧大脑后动脉、小脑上动脉、小脑前下动脉以及同侧小脑后下动脉显影良好,左侧椎动脉未见显影;D. 左侧椎动脉DSA显示左侧椎动脉细小,基底动脉未见显影,同侧小脑后下动脉显影良好(↑示);E. 术中DSA,弹簧圈栓塞动脉瘤后释放支架(↑示);F. 术中DSA,完全释放支架后造影见动脉瘤完全栓塞,载瘤动脉、开窗通道显影良好;G、H. 术后12个月复查DSA,未见动脉瘤复发(↑示原动脉瘤位置),开窗通道未显影

Figure 1 Pre- and post-operative images of a patient with distal developmental anomaly of the vertebral artery associated with basilar artery fenestration malformation and related aneurysm undergoing stent-assisted embolization

A: Preoperative cranial CT shows subarachnoid hemorrhage. B: Preoperative cranial CTA shows poor visualization, considering basilar artery fenestration malformation (↑ indicates). C: 3D-DSA of the right vertebral artery shows basilar artery fenestration malformation (white ↑ indicates) combined with an aneurysm (red ↑ indicates), bilateral posterior cerebral arteries, superior cerebellar arteries, anterior inferior cerebellar arteries and ipsilateral posterior inferior cerebellar arteries are well visualized, and the left vertebral artery is not visualized. D: DSA of the left vertebral artery shows that the left vertebral artery is small, the basilar artery is not visualized, and the ipsilateral posterior inferior cerebellar artery is well visualized (↑ indicates). E: Intraoperative DSA shows release of the stent after coil embolization of the aneurysm (↑ indicates). F: Intraoperative DSA shows complete embolization of the aneurysm after complete release of the stent, and that the parent artery and the fenestration channel are well visualized. G-H: DSA 12 months after the operation shows no recurrence of the aneurysm (↑ indicates the original aneurysm location), and that the fenestration channel is not visualized.

2 讨论

椎动脉远端发育异常合并基底动脉开窗畸形临床少见。基底动脉开窗畸形多位于椎-基底动脉连接处,在基底动脉中、远段少见,多认为是胚胎时期椎动脉融合不全所致^[1]。文献报道基底动脉开窗畸形CTA检出率约2.33%^[2]。开窗处动脉中膜弹性蛋白缺失导致血管强度降低^[3]及开窗处特殊血流动力学改变^[4],使得开窗处容易并发动脉瘤。文献报道,约35%的椎-基底动脉汇合处开窗畸形合并动脉瘤^[5]。对于开窗畸形合并动脉瘤,CTA容易漏诊,尤其合并微小动脉瘤,通常需3D-DSA明确动脉瘤与载瘤动脉、开窗血管的关系。此类病人除因动脉瘤破裂出血发病外,也有因动脉瘤占位引起神经功能缺损就诊。此外,椎动脉远端发育异常可引起同侧血流灌注压力降低,从而影响前庭功能,导致头晕,甚至后循环缺血^[6]。

目前,此类病人首选血管内介入治疗。对于部分窄颈动脉瘤,单纯弹簧圈往往能取得满意效果;对于宽颈、微小或巨大动脉瘤,往往需要支架辅助栓塞。支架辅助栓塞,除了增

加手术难度,也增加手术风险,有时甚至需要牺牲异常开窗通道。Tanaka等^[7]认为开窗环可能存在微小穿支血管,应尽量保护整个开窗环。而Zhang等^[8]认为开窗通道没有穿支血管且病变通道不占优势的情况下,闭塞病变通道相对安全。本文病例左侧椎动脉未与基底动脉汇合,开窗环处也未见穿支血管,一定程度上降低了手术难度,弹簧圈栓塞动脉瘤后完全释放支架,术后即时造影显示开窗通畅,术后12个月行DSA复查,开窗未显影,也无神经功能缺损。如果病变通道有分支血管,应特别注意分支血管保护。此外,支架的使用可能增加缺血风险。Trivelato等^[9]回顾相关文献报道发现,此类病人介入术后并发症发生率约14.5%。对于椎动脉发育不良本身是否引起缺血事件的发生,仍有争议,但椎动脉发育不良合并脑血管病危险因素时,会增加缺血性卒中风险,这个观点得到大多数学者认可。因此,对于椎动脉发育不良合并相关动脉瘤,使用支架辅助栓塞动脉瘤时,建议适当延长抗血小板药物使用时间,对于合并其他高危因素时,甚至建议终身服药。

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解,从而改善了病人生活质量。

【利益冲突声明】:本文不存在任何利益冲突。

【作者贡献声明】:张义彪、常奎、徐敬斌实施手术;王鑫、肖珂、高亚峰查阅资料;张义彪撰写论文。

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(2022-05-18 收稿,2024-04-29 修回)



(上接第 634 页)

综上所述,椎动脉远端发育异常伴基底动脉开窗畸形合并相关动脉瘤临床罕见,诊断上推荐颅脑 DSA,治疗上应注意保护分支血管、尽量保护开窗环;椎动脉发育不良使用支架辅助栓塞治疗动脉瘤可能增加缺血事件发生,应注意预防。

【利益冲突声明】:本文不存在任何利益冲突。

【作者贡献声明】:刘建武收集病例资料、撰写论文、修改论文;何婷、况莹收集病例资料;朱健明、陈志华修改论文。

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(2022-03-23 收稿,2024-01-22 修回)