

. 论 著 .

基底动脉动脉瘤合并胚胎型大脑后动脉自发性闭塞的
诊治分析(附 1 例报道并文献复习)

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【摘要】目的 总结基底动脉动脉瘤合并胚胎型大脑后动脉(FPCA)自发性闭塞致枕叶梗死的诊治经验,以提高此类疾病的认识,避免将FPCA 残端误诊为动脉瘤。方法 回顾性分析 1 例基底动脉动脉瘤合并FPCA 自发性闭塞致枕叶梗死的临床资料。结果 病人以突发右上肢麻木及视物模糊起病,外院DWI显示左侧枕叶内侧面梗死伴左侧丘脑灶样梗死,外院头颈部CTA示左侧颈内动脉后交通动脉动脉瘤(呈梭形)、基底动脉动脉瘤以及颅内多发血管硬化狭窄。我院左侧颈内动脉造影见左侧后交通动脉闭塞残端,残端远端可见中断后又部分显影,左侧大脑后动脉P1、P2均闭塞,椎动脉造影未见P1段发育,基底动脉中段动脉瘤。结合病人DWI梗死部位及术前灌注成像所示灌注失代偿区,考虑为左侧FPCA急性闭塞引起同侧枕叶梗死,CTA所谓的“梭样动脉瘤”其实为闭塞后的残端。采用双支架套叠辅助弹簧圈栓塞治疗基底动脉中段动脉瘤,出院时改良Rankin量表评分 1 分。结论 FPCA 自发性闭塞临床极其罕见,急性闭塞后是否行血管内治疗依然存在争议;应加强对其影像学特征的认识和了解,以避免将其闭塞后残端误当做动脉瘤。

【关键词】基底动脉动脉瘤;胚胎型大脑后动脉;颅内大血管闭塞;血管内治疗
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Diagnosis and treatment of patients with basilar artery aneurysm associated with spontaneous occlusion of fetal posterior cerebral artery: report of one case and literature review

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【Abstract】Objective To summarize the experience in diagnosis and treatment of the patients with basilar artery aneurysm (BAA) associated with spontaneous occlusion of fetal posterior cerebral artery (FPCA). Methods A retrospective analysis was performed on the clinical data and radiologic data including DWI, MRI, CTA and DSA of one patient with BAA associated with spontaneous occlusion of FPCA. Results The patient developed with sudden numbness in the right upper limb and blurred vision. DWI performed in other hospital showed medial infarction of left occipital lobe and focal infarction of left thalamus. Head and neck CTA performed in other hospital showed left posterior communicating artery aneurysm, basilar artery aneurysm and multiple intracranial vascular scleroses and stenoses. The DSA via left internal carotid artery in our hospital showed the occluded stump of the left posterior communicating artery, partial visualization of the distal end of the stump, and the occlusion of P1 and P2 segments of left posterior cerebral artery. The DSA via vertebral artery in our hospital showed no development of P1 segment and BAA. Combining the patient's DWI imaging and the perfusion imaging results, it is considered that the acute occipital lobe infarction was caused by the spontaneous occlusion of left FPCA, and the left posterior communicating artery aneurysm in CTA was actually the stump of FPCA after its occlusion. The patient received double stent-assisted coil embolization for the BAA, and had modified Rankin scale score of 1 point at discharge. Conclusions Spontaneous occlusion of FPCA is extremely rare in clinic, and whether endovascular treatment should be performed after acute occlusion of PFCA is still controversial. It is necessary to strengthen the knowledge and understanding of its imaging characteristics to avoid mistaking the occluded stump as an aneurysm.

【Key words】Basilar artery aneurysm; Fetal posterior cerebral artery; Intracranial large vessel occlusion; Endovascular treatment

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大多数成人的大脑后动脉起源于基底动脉,为椎-基底动脉系统的正常分支。在胚胎型大脑后动脉(fetal posterior cerebral artery, FPCA)的人群中,后交通动脉延续为大脑后动脉的P2段,同时伴有P1段的缺失或发育不全^[1]。尽管FPCA的胚胎发育起源于前循环,但是FPCA本身的急性大血管闭塞在临

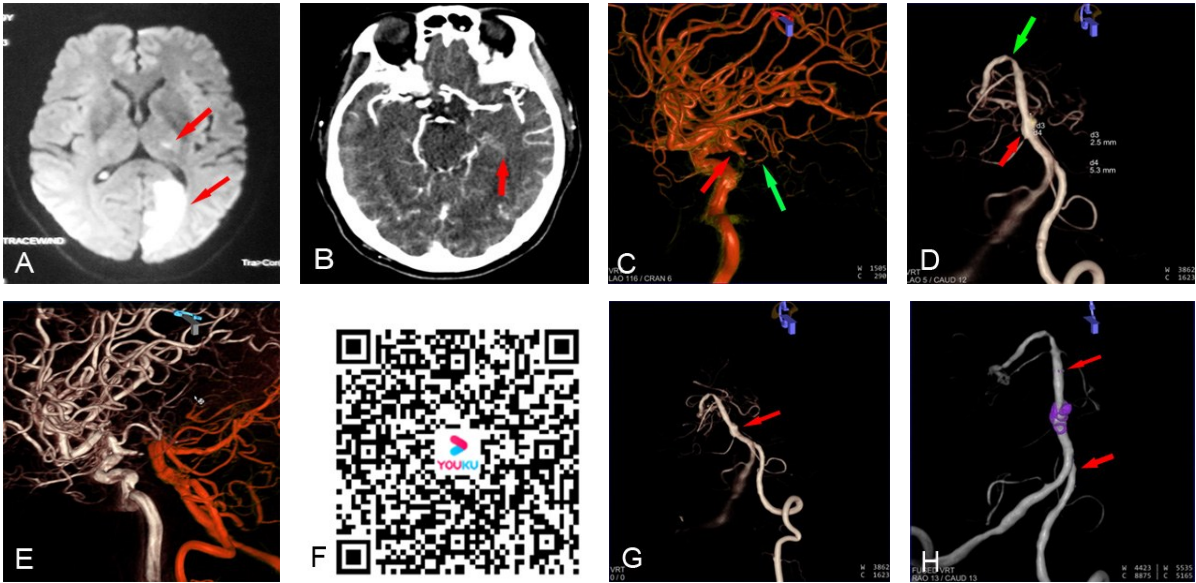


图1 基底动脉中段动脉瘤合并胚胎型大脑后动脉自发性闭塞病人支架辅助栓塞治疗前后影像学表现

A. 外院DWI,红色↑示左侧枕叶梗死以及左侧丘脑灶样梗死;B. 术前增强CT轴位像示左侧大脑后动脉P1、P2段闭塞,红色↑示大脑后动脉中断;C. 3D-DSA,红色↑示左侧胚胎型大脑后动脉闭塞后表现,即术前CTA所怀疑的“后交通动脉动脉瘤”,其残端仍可见一细小分支血管向深部供血(绿色↑示);D. 3D-DSA,红色↑示基底动脉中段动脉瘤,绿色↑示先天缺失的左侧P1;E. 左侧颈内动脉以及左侧椎动脉的三维血管影像融合;F. 三维动态观察再次确定为左侧胚胎型大脑后动脉闭塞,左侧P1段缺失,术前CTA所示动脉瘤的表现实为胚胎型大脑后动脉闭塞后的残端;G. 3D-DSA,红色↑示基底动脉动脉瘤;H. 双Enterprise支架套叠辅助弹簧圈栓塞基底动脉中段动脉瘤后3D-DSA,红色↑示支架显影点

床上极其罕见。本文报道1例FPCA自发性闭塞引起枕叶梗死,同时其残端被CTA检查误诊为动脉瘤,现报道如下。

1 病例资料

59岁男性,因突发右上肢乏力、麻木及视物模糊1 d入院。既往高血压病史10年余,口服降压药控制,自诉控制效果可。10年前曾患脑梗死,未遗留后遗症。外院MRI及DWI示左侧枕叶梗死伴左侧丘脑灶样梗死(图1A)。头颈部CTA检查发现左侧颈内动脉后交通动脉动脉瘤,呈梭形,基底动脉动脉瘤以及颅内多发动脉硬化狭窄。为求进一步处理“颅内多发动脉瘤”来我院就诊。入院体格检查:神志清楚,双眼右侧同向性偏盲,右上肢肌力V级。入院后完善头部320-CTA及灌注成像示:左侧大脑后动脉P1、P2段闭塞(图1B),P3段部分显影,左侧枕叶梗死,相应脑组织灌注下降(失代偿),基底动脉动脉瘤,颅内动脉粥样硬化性改变。完善术前常规检查,同时予以3 d的拜阿司匹林及氯吡格雷抗血小板聚集治疗。采取经股动脉穿刺实施全脑血管造影,采用5s-DSA以及三维重建,结果示:左侧颈内动脉造影见左侧后交通动脉闭塞残端,残端远端中断后又部分显影,考虑为闭塞后改变,左侧大脑后动脉

P1、P2均闭塞,左侧椎动脉造影未见P1段发育,基底动脉中段动脉瘤,大小约2.5 mm×5.3 mm(图1C、1D)。随后,在Siemens System SyngoX-WP工作站进行左侧颈内动脉以及左侧椎动脉的三维血管影像融合,三维动态观察再次确定为左侧FPCA闭塞,左侧大脑后动脉P1段缺失,术前CTA检查所示动脉瘤表现为FPCA闭塞后的残端,同时可观察到残端上向深部供血的一细小分支血管(图1E、1F)。虽然该病人FPCA闭塞,但该残端血管仍然存在重要血供,需继续保留。随后全麻插管,全身肝素化,将Envoy 6F导引导管置于左侧椎动脉V2段,随后在synchro 0.014微导丝引导下将Echelon微导管置于基底动脉动脉瘤瘤腔内,采用双4.4*28 enterprise支架套叠辅助弹簧圈栓塞(图1G、1H)。术后常规予以拜阿司匹林及氯吡格雷抗血小板聚集治疗。术后3 d复查头部CTA示基底动脉通畅,脑灌注同术前,出院时无手术相关并发症,改良Rankin量表评分1分。

2 讨论

2.1 FPCA的变异分类及其闭塞的治疗 FPCA可分为完全型FPCA(complete FPCA, cFPCA)和部分型FPCA(partial FPCA, pFPCA)。主要依据后交通动脉与P1管径进行分类,有单侧FPCA以及双侧FPCA,

诊断的主要依据为 DSA、MRA、CTA 以及超声多普勒检查等,其中 DSA 虽为有创检查但为诊断的金标准。DSA 检查时,应进行前后循环加压的注射造影,必要时行压迫同侧颈动脉造影,用于判别有无 P1。有关解剖及血管造影的文献报道,FPCA 的发生率在 3%~26%^[2,3]。而 FPCA 本身闭塞,极其罕见,是因为此类解剖变异发生率本身就低,而且颈内动脉和 FPCA 之间的压力梯度差较小,还与栓子移动的血流动力学有关,使栓子更容易停留在大脑中动脉而不是 FPCA。从胚胎发育起源上讲,FPCA 源于前循环。有关前循环大血管闭塞的临床试验证实机械取栓术治疗有效,但并不包括 FPCA 闭塞。目前,并没有针对 FPCA 闭塞的治疗指南。有文献报道采用静脉溶栓及机械取栓术成功治疗 FPCA 闭塞^[4]。FPCA 闭塞的病人通常表现为病变对侧的同向性偏盲,同时可能出现面瘫、肢体偏瘫及感觉障碍等。如果病人出现丘脑或者内囊梗死的症状,但大脑前动脉以及大脑中动脉保持通畅,此时应怀疑存在 FPCA 闭塞的可能。

2.2 FPCA 闭塞的原因 脑动脉粥样硬化狭窄仍然是 FPCA 闭塞的风险之一。心源性栓子脱落或者斑块脱落,造成颅内动脉迁移的栓子可以向上到达颈内动脉所有的分支,通过后交通动脉导致 FPCA 及其分支闭塞。任何增加颈内动脉与 FPCA 之间压力梯度差的因素,比如源于椎-基底动脉系统狭窄病变的

血流动力学的改变或者靠近后交通动脉开口处的颈内动脉斑块,都可以增加 FPCA 闭塞的风险。本文病例合并基底动脉夹层动脉瘤,可能是 FPCA 闭塞的风险之一,不排除夹层内的血栓脱落诱发血管闭塞。同时,该病人主动脉弓壁存在广泛的钙化斑块,也是 FPCA 闭塞的风险因素。

【参考文献】

[1] Shaban A, Albright KC, Boehme AK, *et al.* Circle of Willis variants: fetal PCA [J]. Stroke Res Treat, 2013, 2013: 105937.

[2] Lochner P, Golaszewski S, Caleri F, *et al.* Posterior circulation ischemia in patients with fetal-type circle of Willis and hypoplastic vertebrobasilar system [J]. Neurol Sci, 2011, 32: 1143-1146.

[3] Van Raamt AF, Mali WP, van Laar PJ, *et al.* The fetal variant of the circle of Willis and its influence on the cerebral collateral circulation [J]. Cerebrovasc Dis, 2006, 22: 217-224.

[4] Amuluru K, Ho JP, Al-Mufti F, *et al.* Endovascular intervention of acute ischemic stroke due to occlusion of fetal posterior cerebral artery [J]. Interv Neuroradiol, 2019, 25(2): 202-207.

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[12] Cecchini MM, Levitt MR, Taneja M, *et al.* Embolization of carotid-cavernous fistula via direct percutaneous puncture of the inferior ophthalmic vein [J]. J Neuroradiol, 2012, 39 (3): 181-185.

[13] Park SH, Park KS, Kang DH, *et al.* Stereotactic radiosurgery for dural carotid cavernous sinus fistulas [J]. World Neurosurg, 2017, 106: 836-843.

[14] Ogilvy CS, Motiei- Langroudi R, Ghorbani M, *et al.* Flow diverters as useful adjunct to traditional endovascular techniques in treatment of direct carotid-cavernous fistulas [J]. World Neurosurg, 2017, 105: 812-817.

[15] Nadarajah M, Power M, Barry B, *et al.* Treatment of a traumatic carotid-cavernous fistula by the sole use of a flow diverting stent [J]. J Neurointerv Surg, 2012, 4(3): e1.

[16] Borden JA, Wu JK, Shucart WA. A proposed classification for spinal and cranial dural arteriovenous fistulous malformations and implications for treatment [J]. J Neurosurg,

1995, 82(2): 166-179.

[17] Cognard C, Gobin YP, Pierot L, *et al.* Cerebral dural arteriovenous fistulas: clinical and angiographic correlation with a revised classification of venous drainage [J]. Radiology, 1995, 194(3): 671-680.

[18] Satomi J, van Dijk JM, Terbrugge KG, *et al.* Benign cranial dural arteriovenous fistulas: outcome of conservative management based on the natural history of the lesion [J]. J Neurosurg, 2002, 97(4): 767-770.

[19] Thompson BG, Doppman JL, Oldfield EH. Treatment of cranial dural arteriovenous fistulae by interruption of leptomeningeal venous drainage [J]. J Neurosurg, 1994, 80(4): 617-623.

[20] Collice M, D’Aliberti G, Arena O, *et al.* Surgical treatment of intracranial dural arteriovenous fistulae: role of venous drainage [J]. Neurosurgery, 2000, 47(1): 56-67.

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