

情,这类患者通常在出院时存在或轻或重地神经功能缺损,随着后续治疗及康复锻炼,部分患者的临床症状可改善。此外,围手术期发生技术相关并发症,尤其是出血并发症是预后不良的影响因素。因此,拟采用 SAC 治疗的 RIA 患者,预防并发症尤其是出血并发症的发生对其临床预后至关重要。

综上所述,对于 SAC 治疗急性期 RIA 的患者,动脉瘤位于血管分叉处是围手术期发生缺血并发症的独立危险因素;年龄<60岁是围手术期发生出血并发症的独立危险因素;入院时 GCS 评分较差的患者出院时临床预后较差,围手术期出现缺血及出血并发症是预后不良的独立危险因素。但是受限于回顾性研究以及单中心的样本数据,本研究结果的普适性仍较差,其相关结论有待大规模的多中心前瞻性研究进一步证实。

!! ! !!! ! !!!

[参考文献]

[1] WINN H R, JANE J A Sr, TAYLOR J, KAISER D, BRITZ G W. Prevalence of asymptomatic incidental aneurysms: review of 4 568 arteriograms[J]. *J Neurosurg*, 2002, 96: 43-49.

[2] International Study of Unruptured Intracranial Aneurysms Investigators. Unruptured intracranial aneurysms—risk of rupture and risks of surgical intervention[J]. *N Engl J Med*, 1998, 339: 1725-1733.

[3] MAYBERG M R, BATJER H H, DACEY R, DIRINGER M, HALEY E C, HEROS R C, et al. Guidelines for the management of aneurysmal subarachnoid hemorrhage. A statement for healthcare professionals from a special writing group of the Stroke Council, American Heart Association[J]. *Stroke*, 1994, 25: 2315-2328.

[4] MACDONALD R L, SCHWEIZER T A. Spontaneous subarachnoid haemorrhage[J]. *Lancet*, 2017, 389: 655-666.

[5] GRANJA M F, CORTEZ G M, AGUILAR-SALINAS P, AGNOLETTI G J, IMBARRATO G, JAUME A, et al. Stent-assisted coiling of cerebral aneurysms using the Y-stenting technique: a systematic review and meta-analysis[J/OL]. *J Neurointerv Surg*, 2019 Jan 4. pii: neurintsurg-2018-014517. doi: 10.1136/neurintsurg-2018-014517.

[6] AMENTA P S, DALYAI R T, KUNG D, TOPOROWSKI A, CHANDELA S, HASAN D, et al. Stent-assisted coiling of wide-necked aneurysms in the setting of acute subarachnoid hemorrhage: experience in 65 patients[J]. *Neurosurgery*, 2012, 70: 1415-1429.

[7] 张小曦,左乔,刘建民,黄清海,许奕,赵瑞,等. 支架辅助弹簧圈栓塞术和单纯弹簧圈栓塞术治疗急性颅内破裂宽颈动脉瘤安全性的比较[J]. *第二军医大学学报*, 2018,39:124-128.
ZHANG X X, ZUO Q, LIU J M, HUANG Q H, XU Y, ZHAO R, et al. Safety of stent-assisted coiling versus coiling-only in treatment of acute ruptured intracranial wide-necked aneurysms: a comparative study[J]. *Acad J Sec Mil Med Univ*, 2018, 39: 124-128.

[8] 张磊,刘建民. 改良 Rankin 量表[J]. *中华神经外科杂志*, 2012,28:512.

[9] PENGFEI Y, KAIJUN Z, YU Z, RUI Z, LEI Z, WENYUAN Z, et al. Stent-assisted coil placement for the treatment of 211 acutely ruptured wide-necked intracranial aneurysms: a single-center 11-year experience[J]. *Radiology*, 2015, 276: 545-552.

[10] YANG H, SUN Y, JIANG Y, LV X, ZHAO Y, LI Y, et al. Comparison of stent-assisted coiling vs coiling alone in 563 intracranial aneurysms: safety and efficacy at a high-volume center[J]. *Neurosurgery*, 2015, 77: 241-247.

[11] PIOTIN M, BLANC R, SPELLE L, MOUNAYER C, PIANTINO R, SCHMIDT P J, et al. Stent-assisted coiling of intracranial aneurysms: clinical and angiographic results in 216 consecutive aneurysms[J]. *Stroke*, 2010, 41: 110-115.

[12] 李力,段国礼,赵瑞,黄清海,洪波,刘建民,等. 颅内未破裂动脉瘤介入治疗术后神经系统并发症的危险因素分析[J]. *第二军医大学学报*,2018,39:238-244.
LI L, DUAN G L, ZHAO R, HUANG Q H, HONG B, LIU J M, et al. Risk factors of neurological complication after endovascular treatment of unruptured intracranial aneurysm[J]. *Acad J Sec Mil Med Univ*, 2018, 39: 238-244.

[13] BECHAN R S, SPRENGERS M E, MAJOIE C B, PELUSO J P, SLUZEWSKI M, VAN ROOIJ W J. Stent-assisted coil embolization of intracranial aneurysms: complications in acutely ruptured versus unruptured aneurysms[J]. *Am J Neuroradiol*, 2015, 37: 502-507.

[14] PIEROT L, COGNARD C, ANXIONNAT R, RICOLFI F; CLARITY Investigators. Ruptured intracranial aneurysms: factors affecting the rate and outcome of endovascular treatment complications in a series of 782 patients (CLARITY study)[J]. *Radiology*, 2010, 256: 916-923.

[15] MITCHELL P J, MUTHUSAMY S, DOWLING R, YAN B. Does small aneurysm size predict intraoperative rupture during coiling in ruptured and unruptured aneurysms?[J]. *J Stroke Cerebrovasc Dis*, 2013, 22: 1298-1303.

[16] LEE K M, JO K I, JEON P, KIM K H, KIM J S, HONG S C. Predictor and prognosis of procedural rupture during coil embolization for unruptured intracranial aneurysm[J]. *J Korean Neurosurg Soc*, 2016, 59: 6-10.

[17] DETMER F J, CHUNG B J, MUT F, SLAWSKI M, HAMZEI-SICHANI F, PUTMAN C, et al. Development and internal validation of an aneurysm rupture probability model based on patient characteristics and aneurysm location, morphology, and hemodynamics[J]. *Int J Comput Assist Radiol Surg*, 2018, 13: 1767-1779.

[18] MUTO M, GIURAZZA F, AMBROSANIO G, VASSALLO P, BRIGANTI F, TECAME M, et al. Stent-assisted coiling in ruptured cerebral aneurysms: multi-center experience in acute phase[J]. *Radiol Med*, 2017, 122: 43-52.

[19] ZHAO B, YANG H, ZHENG K, LI Z, XIONG Y, TAN X, et al. Preoperative and postoperative predictors of long-term outcome after endovascular treatment of poor-grade aneurysmal subarachnoid hemorrhage[J]. *J Neurosurg*, 2017, 126: 1764-1771.

[本文编辑] 杨亚红