

Willis覆膜支架治疗颅内段颈内动脉病变临床应用

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【摘要】 目的 评价Willis覆膜支架治疗颅内段颈内动脉病变的效果。**方法** 回顾性分析2013年4月至2015年4月采用Willis覆膜支架治疗的201例颅内段颈内动脉病变患者。术后3~6个月随访复查DSA和临床观察结果。**结果** Willis覆膜支架成功治疗198例颅内段颈内动脉病变,其中囊性动脉瘤88例,外伤性动脉瘤19例,假性动脉瘤35例,外伤性颈动脉海绵窦瘘56例,技术成功率达到98.5%。Willis覆膜支架释放部位依次为颈内动脉C7段9例,C6段28例,C5段32例,C4段110例,C3段19例;支架释放后即刻DSA显示病变完全不显影163例,内漏35例,经球囊后扩或再植入支架治疗后病变完全不显影33例(其中2例闭塞载瘤动脉),2例仍存在内漏。术中发生支架源性血管破裂出血5例,术中成功止血4例;术后再出血1例,死亡2例。术后3~6个月随访复查DSA显示载瘤动脉通畅189例,轻度狭窄5例;病变完全不显影196例。临床随访3~20个月,存活患者无新发神经系统体征。**结论** Willis覆膜支架能够安全有效地治疗颅内段颈内动脉病变,但需要更远期随访。

【关键词】 Willis覆膜支架; 颅内段颈内动脉病变; 血管内治疗

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【Abstract】 Objective To evaluate the efficacy of Willis covered stent implantation in treating the vascular diseases located at the intracranial segment of the internal carotid artery. **Methods** The clinical data of 201 patients with the vascular diseases located at the intracranial segment of the internal carotid artery, who were admitted to authors' hospital during the period from April 2013 to April 2015 to receive Willis covered stent implantation, were retrospectively analyzed. Follow-up observation and DSA examination were conducted within 3-6 months after the treatment. **Results** The vascular diseases located at the intracranial segment of the internal carotid artery were successfully treated in 198 patients, the technical success rate was 98.5%. Pathologically, the 198 lesions included saccular aneurysm (n=88), traumatic aneurysm (n=19), pseudoaneurysm (n=35) and traumatic carotid cavernous sinus fistula (n=56). The release sites of Willis covered stent were C7 (n=9), C6 (n=28), C5 (n=32), C4 (n=110) and C3 (n=19) segment of internal carotid artery. DSA performed immediately after the stent deployment revealed that complete occlusion of the aneurysm was achieved in 163 patients, and endoleak was observed in 35 patients. Of the 35 patients, after balloon dilatation or second time stent implantation the aneurysm was completely obstructed in 33, the occlusion of the parent artery was seen in 2 and the endoleak remained in 2. During the operation, bleeding due to stent-related vascular rupture occurred in 5 patients and after proper management successful

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hemostasis was obtained in 4 patients. One patient developed postoperative re-bleeding and 2 patients died. Postoperative DSA examination indicated that the parent artery was unobstructed in 189 patients and was slight narrowed in 5 patients; and in 196 patients the aneurysm was completely occluded. The survival patients were followed up for 3-20 months and no newly-developed neurological signs were observed. Conclusion For the treatment of vascular diseases located at the intracranial segment of the internal carotid artery, Willis covered stent implantation is safe and effective, although its long-term effect needs to be further clarified. (J Intervent Radiol, 2016, 25: 185-188)

【Key words】 Willis covered stent; internal carotid artery; endovascular treatment

2006年Li等^[1]首次报道Willis覆膜支架治疗颅内段颈内动脉海绵窦段假性动脉瘤,历经技术改进和临床应用,积累了丰富的治疗经验,效果日渐获得临床肯定^[2-3]。Willis覆膜支架2013年4月由中国国家食品药品监督管理局批准上市,已广泛应用于颅内段颈内动脉假性动脉瘤、复发或原发的囊性动脉瘤、外伤性动脉瘤和外伤性颈动脉海绵窦瘘等病变^[4-12]。Willis覆膜支架专为颅内血管设计,其治疗机制是对载瘤血管进行修补和重建,即刻隔离和封堵病变,并保持载瘤动脉通畅,恢复病变区域血流至正常状态。本文总结我们采用上市2年间Willis覆膜支架治疗颅内段颈内动脉病变的临床应用情况。

1 材料与方法

1.1 一般资料

收集并回顾性分析2013年4月至2015年4月间上海交通大学附属第六人民医院采用Willis覆膜支架治疗的颅内段颈内动脉病变患者201例。其中男163例,女38例;年龄20~76岁,中位年龄42.7岁。术前所有患者均接受全脑DSA造影评价病变、脑循环和其它伴发病变,受检血管无明显动脉硬化。

1.2 治疗方法

本组所有治疗操作均在全身麻醉下进行,经单侧或双侧股动脉穿刺入路,具体操作过程详见我们既往研究报道^[2,4,11]。术前所有患者由一医师和另一高年资医师单独评价,严格执行适应证,若两人意见一致,即实施Willis覆膜支架治疗;若两人意见不一,则不实施Willis覆膜支架治疗。Willis覆膜支架植入治疗适应证:①颅内段颈内动脉外伤性动脉瘤和假性动脉瘤;②部分其它方法难治的颅内段颈内动脉动脉瘤;③其它各种原因所致动脉壁破损;④选择性应用于颈内动脉海绵窦段以下病变,谨慎应用于颈内动脉海绵窦段以上病变;⑤血管管径3.5~4.5 mm,动脉瘤瘤颈<10 mm。禁忌证:①载瘤动脉管径>5.0 mm或过度扭曲,如呈V形或S形等;②既往

抗凝和抗血小板聚集药物(如口服阿司匹林和氯吡格雷)禁忌病史,如消化道出血或溃疡,全身感染或严重肝肾功能不全等。

术后患者绝对卧床24 h。术前3 d起口服阿司匹林(100 mg/d)和氯吡格雷(75 mg/d),但有158例口服负荷剂量阿司匹林(300 mg/d)和氯吡格雷(300 mg/d);术后给予所有患者低分子肝素(4 100~5 000 U/12 h)皮下注射至少72 h,口服氯吡格雷(75 mg/d)至少6个月,阿司匹林(100 mg/d)长期服用。

术后3、6、12个月随访复查脑DSA造影,评价病变闭塞、颈内动脉通畅、内漏、支架内狭窄等,术后3~20个月临床随访所有存活患者。

1.3 统计学方法

采用SPSS 20.0统计学软件作卡方检验, $P>0.05$ 视作差异无统计学意义。

2 结果

Willis覆膜支架成功治疗198例颅内段颈内动脉病变,其中囊性动脉瘤88例,外伤性动脉瘤19例(图1),假性动脉瘤35例,外伤性颈动脉海绵窦瘘56例(图2),技术成功率达到98.5%;3例颅内段颈内动脉走行扭曲,支架无法到达病变处。Willis覆膜支架释放部位依次为颈内动脉C7段9例,C6段28例,C5段32例,C4段110例,C3段19例;支架释放后即刻DSA显示病变完全不显影163例,内漏35例,经球囊后扩病变完全不显影21例,再植入支架治疗后病变完全不显影12例,其中2例发生支架内急性血栓,采用其它材料原位闭塞病变和载瘤动脉,2例仍存在内漏。术中发生支架源性血管破裂出血5例,术中成功止血4例(3例再次植入支架后止血,1例弹簧圈原位闭塞病变和载瘤动脉),1例死亡;1例球囊暂时止血,术后11 d再出血死亡。

术后3~6个月随访复查DSA显示,载瘤动脉通畅189例,轻度狭窄5例,病变完全不显影196例。临床随访3~20个月,存活患者无新发神经系统体征。



①患者女,49岁,术前全脑DSA造影示颅内段颈内动脉C4段医源性动脉瘤;②血管内介入术中植入Willis覆膜支架(4.0 mm×10 mm);③术后造影示动脉瘤完全不显影

图1 Willis覆膜支架成功治疗外伤性动脉瘤



①患者男,40岁,术前全脑DSA造影示颅内段颈内动脉C4段外伤性颈内动脉海绵窦瘘;②血管内介入术中植入Willis覆膜支架(4.5 mm×13 mm);③术后造影示瘘口完全消失

图2 Willis覆膜支架成功治疗外伤性颈动脉海绵窦瘘

3 讨论

Willis覆膜支架临床应用彻底改变了颅内段颈内动脉病变血管内治疗的传统理念,其操作简单,疗效确切,为颅内段颈内动脉病变血管内治疗技术发展提供了方向^[13-14]。Willis覆膜支架植入治疗机制是对病变血管进行修补和重建,即刻隔离和封堵病变,并保持载瘤动脉通畅,使病变区域血流恢复至正常状态。我们研究团队2000年开始设计使用Willis覆膜支架并作动物实验,2005年4月成功治疗首例颅内段颈内动脉海绵窦瘘外伤性动静脉瘘介入术后假性动脉瘤患者,并先后研究报道临床试验阶段的经验和体会^[1-17]。

传统血管内治疗脑动脉瘤发展于20世纪90年代初电解式可脱弹簧圈(GDC)的临床应用^[18],不过在动脉瘤瘤腔内填塞弹簧圈,存在导管、导丝源性

和弹簧圈源性动脉瘤破裂出血风险^[19];而专为颅内段颈内动脉动脉瘤治疗设计的Willis覆膜支架,既能重建载瘤动脉或封堵动脉瘤壁缺损(绝大多数动脉瘤的病理改变),又不在瘤腔发生治疗操作,可有效地降低并发症发生,提高了治疗效果。血管内治疗外伤性颈内动脉海绵窦瘘的经典方法是使用可脱球囊,具有操作简单、廉价和有一定疗效的优点,但其缺点仍不可忽视——早泄、移位、误栓和假性动脉瘤形成,因此欧美国家已停止使用该方法治疗外伤性颈内动脉海绵窦瘘^[12,20]。Willis覆膜支架植入的优势在于不仅能封堵瘘口,而且可重建载瘤动脉。

在临床试验阶段,选择性患者应用后证实Willis覆膜支架可有效通过颅内段颈内动脉骨性管道,并逐步应用于治疗颈内动脉海绵窦段病变、床突段外伤性假性动脉瘤,进而治疗脑池段脑动脉瘤^[1,4-11,13-14]。

Willis覆膜支架上市后我们严格执行其适应证,本组201例颅内段颈内动脉病变经Willis覆膜支架治疗的技术成功率达到98.5%,治疗率为96.5%,并发症发生率为3.5%,死亡率为1%;与临床试验阶段研究报道相比,差异无统计学意义($P>0.05$)^[2,9]。

总之,Willis覆膜支架上市以来已广泛应用于临床,只要严格把握适应证,有效降低并发症,增加临床观察和随访,其应用前景非常可观。

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