.个案报道.

脑血管造影术后并发高位截瘫1例

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【摘要】造影剂脑病(CIE)是一种在血管内使用造影剂后出现神经功能缺损的罕见疾病,通常有自限性,不会产生严重的后遗症。本文报道1例CIE,51岁女性,有高血压病史,术前无明显神经功能缺损的症状,使用碘克沙醇造影剂行DSA后出现高位截瘫的严重并发症,病人四肢肌力进行性下降至0级,感觉丧失,但病人意识清楚,经过积极治疗后症状未见明显缓解。这是极其罕见的CIE,提示临床医生应该预防其发生。

【关键词】造影剂脑病;脑血管造影术;高位截瘫

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A case of high paraplegia after cerebral digital subtraction angiography

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【**Abstract**】Contrast-induced encephalopathy (CIE) is a rare condition characterized by neurological impairment following intravascular exposure to contrast media. Typically self-limiting, it does not result in significant long-term consequences. We reported a 51-year-old female patient with CIE, who had a history of hypertension and exhibited no apparent signs of neurological deficits prior to digital subtraction angiography (DSA). Following DSA using iodixanol contrast media, she experienced a severe complication manifesting as high-level paraplegia. The patient exhibited progressive grade 0 limb muscle weakness and sensory loss, while maintaining consciousness. Despite active treatment, the symptoms remained unimproved. This case is exceptionally rare in clinic, emphasizing the importance for clinicians to implement preventive measures for CIE.

【**Key words**】Contrast-induced encephalopathy; Digital subtraction angiography (DSA); High paraplegia

1 病例资料

51岁女性,因右手麻木3个月于2021年12月29日入院。既往有高血压病1年,规律口服硝苯地平和厄贝沙坦,血压控制可。入院体格检查:神志清楚;双侧瞳孔等大等圆,对光反射灵敏;四肢肌力5级,肌张力正常;病理征阴性。外院头部CTA显示基底动脉动脉瘤。入院后,完善术前检查,于12月30日行脑血管造影术,未发现颅内动脉瘤(图1A、1B),安返病房。术后2 h,病人突发左侧上肢无力,肌力3级,暂予观察;术后3 h,病人左侧肢体肌力降至2级,右下肢肌力3级,急查头部CT显示造影剂广泛渗漏(图1C)。随后,病人四肢肌力进行性下降至0级,感觉丧失,但病人意识清楚,脑膜刺激征阴性,立即行腰大池引流术,并给予速尿进行利尿以促进造影剂排泄,予以甲强龙1 g、甘露醇250 mg脱水、补液、护胃、改善脑组织水肿、预防脑血管痉挛及继发性癫痫治疗,24 h补液4 000 ml,症状无明显好转。术后第二天凌晨,病人突发昏迷,GCS评分3分,叹息样呼吸,双侧瞳孔直径2.5 mm,对光反射迟钝,病理征阴性,急查头部CT显示急性脑水肿(图1D)。随即转入重症监护病房,血压降至68/40 mmHg,动脉血气分析显示2型呼吸衰竭,床旁超声显示双下肺肺不张、下腔静脉宽度0.9 cm。病人血压下降考虑与颅内压降低、有效循环血量不足、中枢性呼吸衰竭及继发性脑干功能损害有关,立即行气管插管呼吸机辅助通气,予以快速补液、甲强龙1 g、去甲肾上腺素泵升压、镇静、护胃、脱水、抗感染、抗凝、预防脑血管痉挛及继发性癫痫等治疗。术后第三天,病人意识恢复,呼之睁眼。术后第五天,病人可遵嘱睁眼闭眼及点头,四肢肌力无好转,胸2水平以下感觉丧失,病理征阳性。术后第7天,拔除腰大池引流管及气管插管,予以气管切开术。术后第13天,行头颈部MRI显示颈髓弥漫T_2像信号增高(图1E、1F),考虑造影剂渗漏导致颈髓水肿,继续脱水治疗。术后42 d,神志清楚,GCS评分12分,双侧瞳孔等大等圆,直径1.5 mm,对光反射迟钝,上肢肌力0级,下肢肌力1级,肌张力低,胸2水平以下感觉丧失,病理征阳性,出院后继续行高压氧和康复锻炼治疗。出院后5个月随访,四肢肌力及感觉无明显改善。

2 讨 论

CIE是一种在血管内使用造影剂后出现神经功能缺损的罕见疾病,通常发生于术后数分钟至数小时,一般在数天内可恢复[1];不良反应有皮质盲、无菌性脑膜炎、偏瘫、语言障碍、癫痫发作等,具有自限性和可逆性;危险因素包括高血压、糖尿病、肾脏疾病等[2,3]。目前,CIE无明确的诊断标准,需

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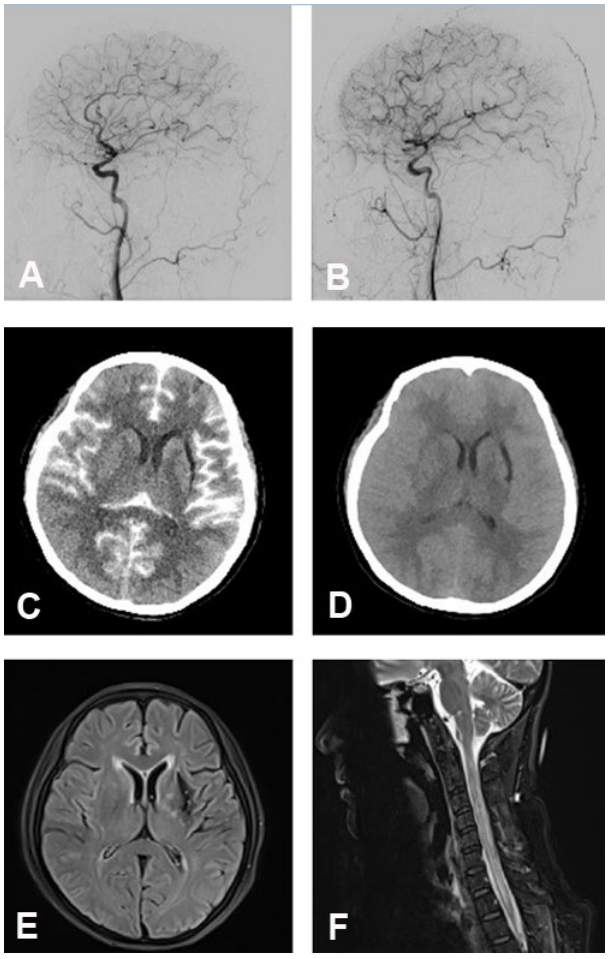

图1 脑血管造影术后并发高位截瘫病人的影像表现

A、B. DSA表现；C. DSA后3 h脑部CT示脑沟、脑裂、脑池、第三脑室、第四脑室及脊髓外蛛网膜下腔广泛密度增高，脑实质稍显肿胀；D. DSA后3 d复查CT示未见广泛密度增高，但脑实质弥漫肿胀、侧脑室受压较前捎加重；E、F. DSA后13 d头颈部MRI示双侧大脑半球白质区、双侧基底节区及脑桥区散在多发腔隙性脑梗死灶，颈髓弥漫条片状T_2信号增高

Figure 1 Imaging findings of a patient with high-level paraplegia after cerebral angiography

A-B: DSA findings; C: Brain CT 3 hours after DSA showed extensive increased density in the sulcus cerebri, fissure cerebri, cistern cerebri, third ventricle, fourth ventricle and extraspinal subarachnoid space, and slight swelling of brain parenchyma; D: CT 3 days after DSA showed no extensive increased density, but diffuse swelling of brain parenchyma and increased lateral ventricular compression; E-F: Head and neck MRI 13 days after DSA showed multiple lacunar infarcts scattered in the white matter of bilateral cerebral hemispheres, basal ganglia and pons, and diffuse lamellar T_2 signal increase in the cervical spinal cord.

与急性脑卒中、蛛网膜下腔出血等疾病鉴别，一般通过临床表现、影像学检查进行排他性诊断[4,5]。目前，CIE的发病机制尚不明确，可能与造影剂直接神经毒性有关，造影剂可损伤血管内皮，破坏血脑屏障，从而渗入脑组织，引起脑水肿[6,7]。

本文病例CIE继发高位截瘫、中枢性呼吸衰竭和脑干功能衰竭，发病后根据神经内科意见完善自身免疫相关抗体检查排除自身免疫性疾病、脊髓或周围神经病变等隐匿性疾病，造影剂主要滞留在蛛网膜下腔及脑池，为减少造影剂对神经的毒性作用，使用利尿剂、腰大池引流等，以便将造影剂尽快排除体外。腰大池引流时应测颅内压，监测生命体征，同时控制性放液引流，警惕颅内压下降过快。本文病人因自身原因未行电视野、头部DWI及脑电图检查，排除高位截瘫与颅内运动区域有关，目前考虑高位截瘫主要与造影剂对颈髓产生直接毒性刺激，或合并有相应节段脊髓动脉痉挛导致脊髓缺血相关。研究表明大多数CIE表现为局限性造影剂渗漏和脑组织水肿，而本文病例造影剂波及范围大，包括整个脑组织和脊髓，且经过积极治疗后症状未见明显缓解。

总之，鉴于本文病例的不良预后，我们认为，对于具有CIE高风险因素的病人，应做好术前准备，对CIE有较为清晰的认识和判断，发病早期积极行激素冲击、脱水、补液等对症处理尤为关键，以减少造影剂对病人的损害。

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