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· 论著 ·

## 急性视网膜坏死伴视网膜中央动脉阻塞的临床观察

闵洁, 张丽珠, 马银燕, 李娟娟

(云南省第二人民医院眼科, 云南省眼科疾病研究重点实验室, 云南省眼科医院, 昆明 650021)

**[摘要]** 目的: 观察急性视网膜坏死(acute retinal necrosis, ARN)并视网膜中央动脉阻塞(central retinal artery occlusion, CRAO)的临床特征并进行文献复习。方法: 回顾云南省第二人民医院于2015年1月至2019年9月确诊的ARN合并视网膜中央动脉的患者6例(8眼), 结合病史、病情发展、转归及影像学检查表现进行分析, 并结合以往相关文献报道, 对ARN合并视网膜中央动脉这一少见病例的临床表现进行总结。结果: 眼底彩色照相及超广角照相可见玻璃体轻至中度混浊, 视网膜苍白水肿, 以周边视网膜明显, 后极部视网膜动脉白线, 周边视网膜血管闭塞, 伴动脉走行可见大量出血, 视网膜大片斑状黄白色渗出; 眼底荧光造影可见荧光素充盈不同程度延迟, 视网膜散在少许斑状出血遮蔽荧光, 视网膜动脉管径细, 各方向周边视网膜血管闭塞, 大片低荧光无灌注区形成。眼底(optical coherence tomography, OCT)结果显示后极部视网膜水肿增厚, 以内层视网膜水肿危重, 层次结构欠清晰。部分区域可见神经上皮液。结论: ARN合并CRAO虽然较为少见, 但会进一步严重破坏患者视功能, 因此CRAO应该被知晓为一类ARN严重并发症, 在对ARN患者诊断和治疗的过程中应加强对CRAO的风险认识和评估。

**[关键词]** 急性视网膜坏死; 视网膜中央动脉阻塞; 临床观察

## Clinical observation of acute retinal necrosis complicated with central retinal artery occlusion

MIN Jie, ZHANG Lizhu, MA Yinyan, LI Juanjuan

(Department of Ophthalmology, Second People's Hospital of Yunnan Province, Yunnan Key Laboratory of Ophthalmic Diseases, Yunnan Eye Hospital, Kunming 650021, China)

**Abstract** **Objective:** To observe the clinical features of acute retinal necrosis (ARN) complicated with central retinal artery occlusion (CRAO). **Methods:** Six patients (8 eyes) diagnosed with ARN complicated with CRAO in our hospital from January 2015 to September 2019 were reviewed. The medical history disease progression, prognosis and

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通信作者 (Corresponding author): 李娟娟, Email: ljj800502@163.com

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the performance of fundus imaging were analyzed to summarize the clinical manifestations of these rare cases. **Results:** Color photography and ultra-wide-angle photography of the fundus showed mild to moderate opacity of the vitreous body, pale edema of the retina, white lines of posterior pole retinal arteries, occlusion of peripheral retinal vessels, massive bleeding with arterial course, and large patches of yellow retina. Fundus fluorescein detected different degrees of fluorescein filling delay, scattered light spots in the retina to block the fluorescence, small retinal arterial diameter, peripheral retinal vessel occlusion in all directions, and large areas of non-perfusion area. The fundus OCT showed that the posterior pole retinal edema was thickened, the inner retinal edema was severe, and the layered structure was not clear. Subepithelial fluid was seen in some areas. **Conclusion:** Although ARN complicated with CRAO is relatively rare, it can aggravate damage to the visual function of patients. Therefore, CRAO should be known as a serious complication of ARN. The risk of CRAO should be monitored and assessed during the diagnosis and treatment of ARN.

**Keywords** acute retinal necrosis; central retinal artery occlusion; clinical observation

急性视网膜坏死(acute retinal necrosis, ARN)是由病毒感染引起的视网膜全层的炎性疾病<sup>[1]</sup>。临床上较为常见的眼底表现有视网膜动脉炎、黄色动脉粥样套袖、视网膜分支动脉狭窄以及阻塞<sup>[2]</sup>。大部分患者的病变规律为病灶从视网膜周边开始逐步向后极部发展<sup>[3]</sup>。视网膜中央动脉阻塞(central retinal artery occlusion, CRAO)是一类报道较少的ARN并发症, CRAO使得ARN的疾病预后更为不佳。本文总结了6例(8眼)ARN并CRAO患者的临床资料, 结合病史、病情发展、转归及影像学检查表现, 对其进行分析, 并回顾文献, 讨论其发病机制及两者相关性, 以期在临床工作中增强对ARN合并CRAO的认识, 对病变的发展方向加以重视。

## 1 对象与方法

### 1.1 对象

回顾性分析云南省第二人民医院于2015年1月至2019年9月经眼科多模式影像技术、术中玻璃体标本聚合酶链反应病毒检测等手段确诊的6例(8眼)ARN合并CRAO患者, 其中男4例, 女2例, 年龄(44.0±2.5)岁。其中单眼发病4例, 双眼发病2例。患者均以视力骤降就诊, 视力手动~0.1, 均有眼前段炎症反应, 玻璃体混浊, 眼底可见闭塞性视网膜血管炎以周边水肿坏死视网膜病灶。患者均通过眼底荧光血管造影确诊合并CRAO。排除标准: 可能与ARN相混淆的其他原因引起的葡萄膜炎及脉络膜视网膜炎, 如巨细胞病毒性视网

膜炎、梅毒性视网膜炎、外源性细菌性眼内炎、Behcet病性葡萄膜炎等; 由心血管疾病引起的CRAO<sup>[4]</sup>。

### 1.2 方法

患者均行双眼最佳矫正视力(best corrected visual acuity, BCVA)、裂隙灯显微镜、散瞳后间接检眼镜及眼底彩色照相及超广角眼底照相、眼底视网膜荧光血管造影(fundus fluorescein angiography, FFA)、光相干断层扫描(optical coherence tomography, OCT)等检查。眼底彩色照相采用NIDEK眼底照相机; 超广角眼底照相采用英国Optos 200Tx; 眼底血管荧光造影检查采用德国海德堡HRA眼底血管造影仪。给予患者静脉注射10%荧光素钠2.5 mL快速推注入肘静脉内, 8~10 s后加滤光片进行各个象限拍摄, 起初为连续拍摄, 后改为间歇拍摄, 获取FFA像。采用海德堡Spectralis HRA OCT进行OCT检查, 扫描参数为: 扫描深度5~8 mm, 扫描部位以黄斑区为中心进行水平扫描。最终结合患者病史、病情发展、转归、各影像学检查表现及以往相关文献报道, 对ARN合并视网膜中央动脉这一少见病例的临床表现作出分析总结。

## 2 结果

### 2.1 眼底彩色照相

6例(8眼)ARN合并CRAO患者中, 1眼的眼底彩色照相可见玻璃体轻至中度混浊, 眼底模糊; 5

眼后极部可见视盘及视网膜水肿, 动脉白线, 中周部大片出血及黄白色渗出(图1A); 3眼可见坏死病变较轻, 主要位于周边部, 后极部视网膜水肿明显, 血管尚有血流灌注, 其中一眼睫网动脉患者, 相应区域视网膜颜色正常(图1B)。

## 2.2 超广角眼底照相

6例(8眼)ARN合并CRAO患者双眼超广角眼底照相, 其中5眼可见玻璃体轻至中度混浊, 视网膜苍白水肿, 以周边视网膜明显, 后极部视网膜动脉白线, 周边视网膜血管闭塞, 伴动脉走行可见大量出血, 视网膜大片斑状黄白色渗出(图2A)。3眼可见视网膜动脉管径狭窄, 后极部视网膜苍白水肿, 视盘水肿, 盘周出血, 视网膜少许斑片状出血(图2B)。

## 2.3 眼底血管荧光造影

6例(8眼)患者眼底血管荧光造影结果显示: 5

眼坏死病变较为严重者玻璃体混浊遮蔽荧光, 视网膜出血及渗出遮蔽荧光, 视网膜动脉管径细, 动脉节段染色伴荧光渗漏, 各方向周边视网膜血管闭塞, 视网膜大片低荧光无灌注区(图3)。3眼病变较早期者臂-视网膜循环时间明显延长, 视网膜静脉荧光素充盈也明显延长, 脉络膜背景低荧光, 视盘周围及黄斑区低荧光明显, 视网膜散在少许斑状出血遮蔽荧光, 视网膜动脉管径细, 伴有少许荧光渗漏, 各方向周边视网膜血管闭塞, 大片低荧光无灌注, 视盘毛细血管扩张、荧光渗漏边界欠清(图4)。

## 2.4 OCT

6例(8眼)患者眼底OCT检查结果显示: 4眼屈光介质不清, 成像质量不佳, 4眼OCT可见后极部视网膜水肿增厚, 以内层视网膜水肿显著, 层次结构欠清晰。部分区域可见神经上皮下液(图5)。

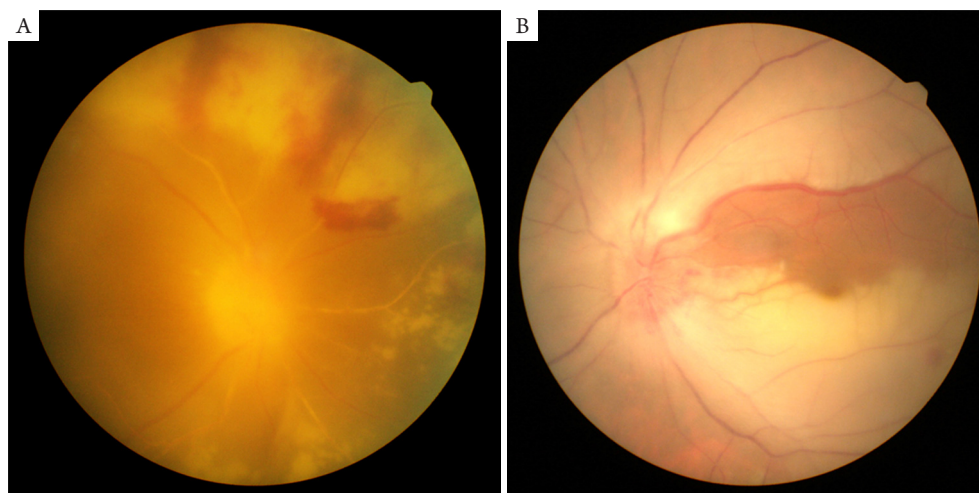


图1 ARN合并CRAO患者眼底彩色照相

### Figure 1 Color fundus photography of ARN complicated with CRAO

(A)患者1眼底彩色照相。玻璃体混浊, 眼底模糊, 后极部视盘及视网膜水肿, 动脉白线, 中周部大片出血及黄白色渗出; (B)患者2眼底彩色照相, 视网膜动脉狭窄, 除黄斑上方睫状视网膜动脉供应的区域外, 视网膜大片苍白水肿, 视盘水肿。  
(A) Color fundus photograph of case 1. Vitreous opacity, blurred fundus, optic disc and retinal edema of posterior pole, white lines of arteries, massive bleeding, and yellow-white exudation in middle and peripheral areas; (B) Color fundus photograph of case 2. Retinal artery stenosis. Except for the area supplied by the ciliary retinal artery above the macula, the retina showed large pale edema and optic disc edema.



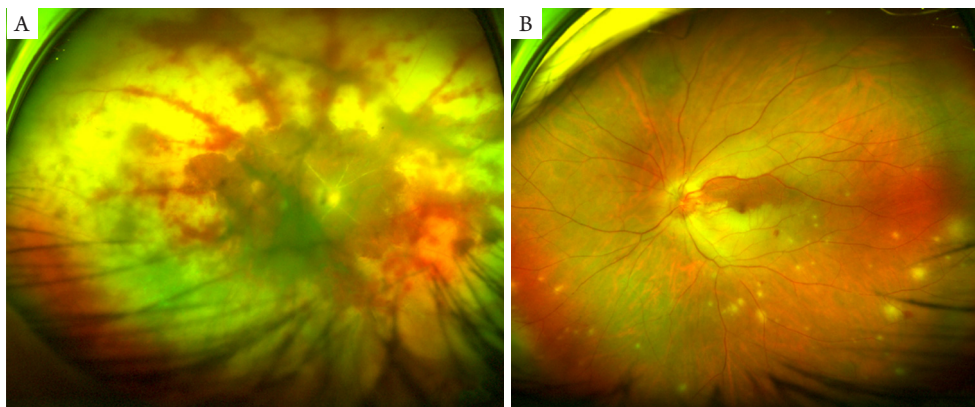


图2 ARN合并CRAO患者超广角眼底照相

**Figure Ultra wide-angle fundus photograph of ARN complicated with CRAO**

(A)患者1患眼超广角眼底照相。玻璃体轻至中度混浊，视网膜苍白水肿，以周边视网膜明显，后极部视网膜动脉白线，周边视网膜血管闭塞，伴血管走行可见大量出血，视网膜大片斑状黄白色坏死灶；(B)患者2患眼超广角眼底照相，视网膜动脉管径狭窄，除黄斑上方睫状视网膜动脉供应的区域外，后极部视网膜苍白水肿，视网膜周边小片状坏死灶。

(A) Ultra-wide-angle fundus photograph of case 1, with light to moderate vitreous opacity, pale edema of the retina, especially the peripheral retina, white line of the posterior retinal artery, occlusion of peripheral retinal vessels, and massive hemorrhage with large blood vessels. Spotted yellow-white necrotic foci. (B) Ultra-wide-angle fundus photograph of case 2. The diameter of the retinal artery was small. Except for the area supplied by the ciliary retinal artery above the macula, the retina was pale and edema, and small pieces of necrosis around the retina were observed.

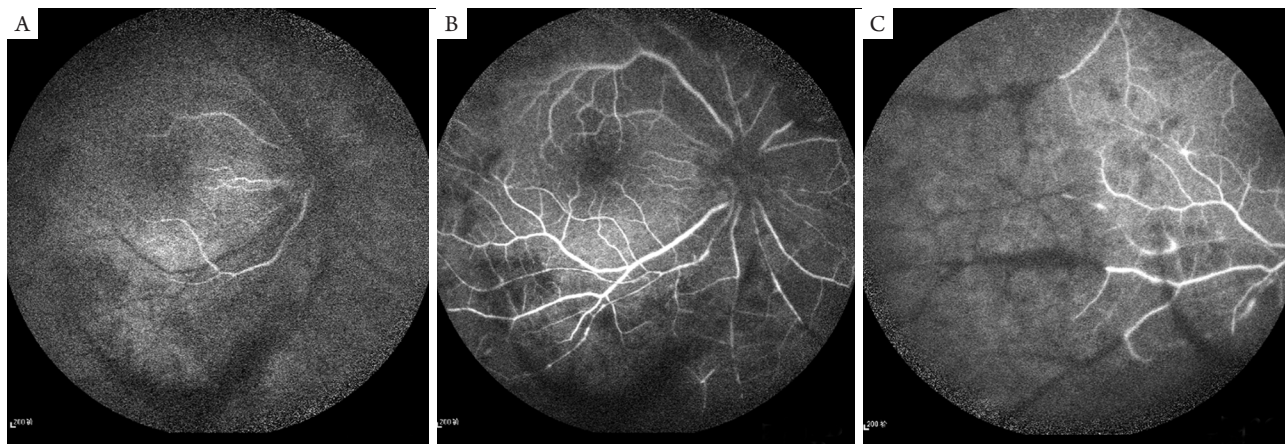


图3 患者1眼底荧光血管造影

**Figure 3 Fundus fluorescein angiograph of case 1**

(A)造影22.8"动脉前锋开始出现，大部分动脉仍无充盈；(B)造影36.89"所有动脉充盈完成，颞侧部分静脉充盈，鼻侧大部分静脉尚未充盈；(C)周边视网膜动脉管径细，动脉节段染色伴荧光渗漏，血管闭塞，视网膜大片低荧光无灌注。

(A) Angiography 22.8" arterial front-peak began to appear, most of the arteries were still not filled; (B) Angiography 36.89" all arteries were filled, part of the temporal vein was filled, most of the nasal veins were not filled; (C) Peripheral retinal artery had a small diameter, arterial segment was stained accompanied with fluorescent leakage, vascular occlusion, and a large retinal low fluorescence without perfusion.

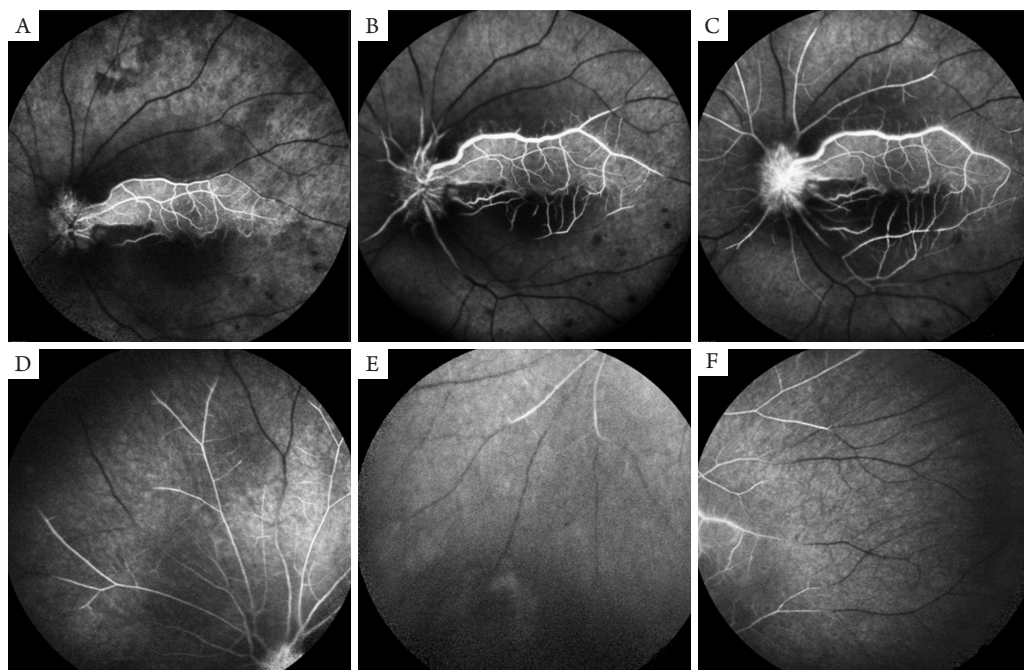


图4 患者2眼底血管荧光造影

**Figure 4 Fundus fluorescein angiograph of case 2**

(A) 造影33"见睫网动脉充盈完成, 其余动脉未见前锋出现; (B) 造影39.21"动脉前锋出现; (C) 造影1'50"动脉充盈仍未完成; (D, F) 周边视网膜血管闭塞, 大片低荧光无灌注。

(A) Angiography 33" showed the filling of the ciliary artery, and no front-peak was noted in the other arteries; (B) Angiography 39.21" arterial front-peak appears; (C) Angiography 1'50" arterial filling was not completed; (D, F) Peripheral retinal vessels were occluded and large areas of low fluorescence without perfusion were seen.

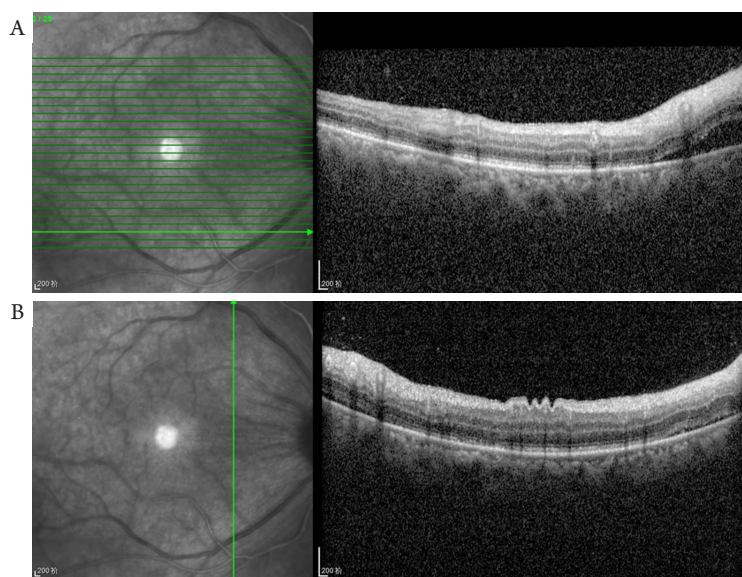


图5 患者1眼底OCT影像

**Figure 5 OCT image of case 1**

后极部视网膜水肿增厚, 以内层视网膜水肿明显, 层次结构欠清晰。部分区域可见神经上皮下液。

Posterior retinal edema was thickened, the inner layer of retinal edema was evident, the layered structure was not clear. Subepithelial fluid could be seen in partial areas.



### 3 讨论

ARN是一类以坏死性视网膜炎并严重葡萄膜炎的眼底感染性疾病,其较为典型的眼底表现为周边部开始发生进展的闭塞性视网膜动脉炎症,这一临床特征已成为诊断该病的一项临床指标。然而,这并不意味着视网膜中央动脉不受累,ARN并发CRAO虽较为少见,但也有包含不少病例的报道<sup>[5]</sup>。

对于ARN合并CRAO的发病机制,目前均认为与ARN本身的病毒感染有密切的相关性。ARN起始存在的血管病变致使视网膜中央动脉发生阻塞的趋势,其确切的阻塞机制目前尚不清楚,但病理检测结果<sup>[6]</sup>显示:血管内的肉芽肿性炎症反应、病毒的浸润以及免疫介导反应共同参与了血栓的形成。这种血栓在主要累及小血管的同时,也存在阻塞较大分支血管的可能性。而有学者<sup>[6]</sup>认为CRAO的发生是病毒活跃性较高的一种指标。除直接栓子形成的机制外,血液流变学的变化也被认为是发生血管阻塞的另一参与因素。在文献<sup>[7]</sup>中,发生ARN合并CRAO的患者具有高血压、高血脂等相关基础疾病。Yeh等<sup>[7]</sup>研究发现:对于先前患有血管病变的患者,在ARN环境下更容易发生中央视网膜病变,因此可以认为在ARN的基础上,CRAO的发病率可有所提高。但CRAO的发生与这些基础疾病之间是否具有直接关系,目前并不明确<sup>[8]</sup>。

就临床表现而言,由于ARN是以闭塞性血管病变为主要改变,且均主要累及视网膜动脉,尤其当病变进展至后极部,坏死病灶显著时,临床上容易忽略中央动脉的问题。在本组病例中,其中病变较重的患者,大部分血管均呈白线,需借助眼底荧光造影确诊CRAO;而病变较轻的患者继发CRAO时由于眼底的表现特征性相对明显,同时受屈光介质和坏死病灶的影响较少,因此诊断较为明确。ARN合并CRAO会对患者的预后带来更为严重的影响。在本组病例中,患者均主诉视力急剧下降,视力手动到0.1不等,视力损害均较严重。Shah等<sup>[9]</sup>研究认为:ARN在CRAO的背景下,使视力更加恶化。

综上,ARN合并CRAO虽然较为少见,但对患者视功能带来进一步严重的破坏,因此CRAO应该被知晓为一类ARN严重并发症,在对ARN患者诊断和治疗的过程中应加强对CRAO的风险认

识和评估。

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