• 指南与共识 •

《中国视网膜静脉阻塞临床诊疗路径专家共识》解读

苗恒[1]　黎晓新[1,2]　赵明威[1]

[1]北京大学人民医院眼科　北京眼科疾病与视光研究所　视网膜与脉络膜疾病诊断与治疗北京市重点实验室 北京大学医学部视光学院, 北京 100044；[2]厦门大学附属厦门眼科中心, 厦门 361003

通信作者: 赵明威，Email：dr_zhaomingwei@163.com

【摘要】 视网膜静脉阻塞（RVO）是我国导致视功能严重丧失的常见眼底血管性疾病之一。近年来多种新兴的影像学技术和新药的出现，不但深化了对该病自然病程的认识，也改变了该病传统上以视网膜激光光凝为金标准的治疗模式，进而显著改善了患者的视功能预后。但目前我国各地区各层级医院对RVO的诊断和治疗仍以自己的经验积累为主，各地眼科医师对RVO的干预意识与知识的普及率仍有待提高，需要规范化的临床诊疗路径以满足大部分患者的诊治需求。由中华医学会眼科学分会眼底病学组和中国医师协会眼科医师分会眼底病专业委员会牵头，在综合国内外现有循证证据的基础上，遵循共识制定的原则，编纂了《中国视网膜静脉阻塞临床诊疗路径专家共识》一文，系统全面地阐述了RVO的规范化诊疗路径。针对该共识中的要点进行解读，有助于突显其中的核心要点和思想，提高各级眼科医师对RVO诊治的规范性和有效性。

【关键词】 视网膜静脉阻塞；　诊疗路径；　共识解读

DOI: 10.3760/cma.j.cn511434-20240218-00071

Interpretation of *Expert consensus on clinical diagnosis and treatment path of retinal vein occlusion in China*

Miao Heng[1],　Li Xiaoxin[1,2],　Zhao Mingwei[1]

[1]Department of Ophthalmology, Peking University People's Hospital, Eye Diseases and Optometry Institute, Beijing Key Laboratory of Diagnosis and Therapy of Retinal and Choroid Diseases, College of Optometry, Peking University Health Science Center, Beijing 100044, China; [2]Xiamen Eye Center of Xiamen University, Xiamen 361003, China

Corresponding author: Zhao Mingwei, Email: dr_zhaomignwei@163.com

【Abstract】 Retinal vein occlusion (RVO) is one of the most important retinal vascular diseases in China that leads to severe loss of vision. In recent years, the emergence of various emerging imaging technologies and new drugs has not only deepened our understanding of the natural course of this disease, but also significantly changed the traditional treatment mode of retinal laser photocoagulation as the gold standard, thereby significantly improved the visual prognosis. However, currently in various regions and levels of hospitals in China, the diagnosis and treatment of RVO still rely mainly on their own experience. The awareness and knowledge of RVO among ophthalmologists in various regions still need to be improved. A standardized clinical diagnosis and treatment pathway is needed in order to meet the needs of most RVO patients. Led by the Fundus Disease Group of the Ophthalmology Branch of the Chinese Medical Association and the Fundus Disease Professional Committee of the Ophthalmology Branch of the Chinese Medical Association, based on the existing evidence-based evidence at home and abroad, and following the principles of consensus formulation, *Expert consensus on clinical diagnosis and treatment path of retinal vein occlusion in China* has been compiled. The consensus systematically and comprehensively elaborated a standardized diagnosis and treatment pathway for RVO. Interpreting the key points in this consensus is helpful to highlight the core ideas, and improve the utilization of this consensus by ophthalmologists from all levels of hospitals.

【Key words】 Retinal vein occlusion;　Pathways for clinical diagnosis and treatment;　Interpretation of expert consensus

DOI: 10.3760/cma.j.cn511434-20240218-00071

视网膜静脉阻塞（RVO）是我国常见的视网膜血管性疾病之一，也是继糖尿病视网膜病变之后导致视力下降甚至丧失的第二大眼底疾病[1]。近年来，随着抗血管内皮生长因子（VEGF）类药物和眼内糖皮质激素缓释剂等药物的出现和广泛使用，RVO患者的视功能预后得到了显著的改善。但与此同时，不充分/不规范的药物应用和过度/不足的视网膜激光光凝治疗等问题也在眼全科医师和各地区基层眼科医师中普遍存在。此外，因对RVO的原发病因管理/处置和自然病程的认识不够充分，很多RVO患者没能接受针对原发疾病的治疗和全病程管理，致使患者虽然能在治疗初期恢复一定的视功能，但却因原发疾病没有得到处置或自然病程的恶化进展而最终发生新生血管性青光眼（NVG），以致永久性视功能丧失[2]。为满足大部分RVO患者的诊治需求，《中国视网膜静脉阻塞临床诊疗路径专家共识》[3]从RVO的定义与分型、病因和发病机制、初诊病情评估、临床路径共识和复诊病情评估和随诊管理等五个方面，对RVO进行了全面的描述，并提供了极具实用性的诊疗路径图以供临床医生参考。临床医师在应用本共识时还应考虑患者的个体情况，根据病情、可选择的治疗方案、患者的经济承受能力等因素综合采取治疗措施。

1 理解RVO分型的定义、阶段性及其与自然病程的关系

为使诊疗路径更具可操作性，本共识按静脉阻塞发生的位置将RVO分为视网膜中央静脉阻塞（CRVO）和视网膜分支静脉阻塞（BRVO）两种类型[1]。按荧光素眼底血管造影（FFA）所示视网膜毛细血管无灌注区（NP）面积，每种类型又可进一步分为缺血型和非缺血型[4]。缺血型CRVO指基线时NP面积“足够大”（标准7视野FFA中NP＞10个视盘面积、超广角FFA中NP＞75个视盘面积和缺血指数≥35%）且随访中更容易发生眼前后节新生血管事件的RVO[5-7]，其判断通常需要综合视力、瞳孔反射、眼底表现和FFA/光相干断层扫描（OCT）血管成像（OCTA）/视网膜电图等辅助检查综合完成[7-10]。缺血型BRVO的定义尚有争议，因其较少发生NVG，所以界定不像缺血型CRVO那般紧迫[11]。

RVO的NP面积可随起病后时间延长而发生从无到有或进行性扩大的动态变化，因此基线时非缺血型RVO患眼可在随访中转化为缺血型，进而继发眼前后节新生血管性事件。长期规律随访和全病程管理不但有助于稳定RVO患眼的视功能，也对改善其长期预后具有重要意义[2]。

2 强调RVO患者初诊时全面病情评估的重要性

初诊RVO患者的评估内容包括寻找病因和危险因素、判断眼部病情严重程度和寻找需要密切关注/立即处置的并发症三个方面。

RVO的发病机制大致可分为并发于低灌注压的RVO、并发于系统性或眼局部炎性疾病的RVO、并发于系统性或眼局部非炎性疾病的RVO，以及原发性RVO四大类[12-14]。除原发性RVO外，其余三种RVO的发生皆与系统性疾病或眼局部血管性/非血管性因素有关。初诊时，临床医生需根据诱因和发病过程等病史，结合眼部体征和眼外症状/体征寻找潜在的危险因素或病因，重点关注心血管方面的问题[15]，并与形似RVO的其他眼病相鉴别。本共识中也给出了初诊时推荐的全身和眼科辅助检查内容，接诊医师可根据实际情况有倾向性地选取相应的项目进行过筛[4, 16]。

对发现存在异常结果的患者，还需联合其他专业科室医生共同完成评估和处置。RVO并非孤立的眼科疾病，其原发疾病/危险因素的管理和处置对改善RVO患者的长期预后非常重要。但不应过分强调寻找病因而因此延误眼部治疗。病因/危险因素的筛查过程应与眼部并发症的诊疗过程同步进行[16]。

黄斑水肿、NP和眼前后节新生血管形成，以及晚期玻璃体积血、视网膜脱离甚至NVG发生，既是RVO眼部主要并发症，也是RVO危害视功能的主要方式[16]，因此也成为基线时应重点评估的眼科内容。强调OCT、超广角FFA和超广角OCTA在基线时对评估患眼是否需要治疗、需要何种治疗及治疗紧迫性的作用[9]。对病程超过2个月的患眼，无论眼前节是否存在新生血管，还应强调房角镜检查，以发现常规裂隙灯显微镜检查不可见的房角新生血管。已存在眼前后节新生血管的患眼需要更为迫切的治疗和密切的随访，以避免晚期并发症的发生。

3 规范、合理、综合地应用现有治疗手段

玻璃体腔注射抗VEGF药物、糖皮质激素缓释剂治疗和视网膜激光光凝是现有的针对RVO眼部并发症的主要干预手段[6, 11, 17-32]。对存在病因/危险因素的RVO患者，应强调原发因素的综合管理和控制，以改善RVO的自然病程和长期预后[16]。

规范的“3+按需治疗”模式的抗VEGF药物治疗，即首诊开始每个月注射1次，连续注射3次，可下调眼内VEGF水平，暂时性减轻/消除黄斑水肿并改善视力。单克隆抗体类和融合蛋白类抗VEGF药物在安全性和有

效性方面并无显著差异[33-35]，均可作为存在眼局部并发症的RVO患眼的一线治疗选择。当患眼对抗VEGF药物治疗反应不佳，且无眼内糖皮质激素使用禁忌时可考虑使用玻璃体腔注射糖皮质激素缓释剂作为二线治疗选择[17, 24-26]。当患者存在抗VEGF药物治疗的绝对/相对禁忌证（易发心脑血管事件、妊娠等），无眼内糖皮质激素使用绝对禁忌，以及并发于系统性/眼局部炎性疾病的RVO，和（或）因各种因素需要降低玻璃体腔注射频率等极特殊的情况下，方可考虑糖皮质激素缓释剂作为RVO患眼的一线治疗选择，且应警惕用药后糖皮质激素相关的眼部不良事件[36]。

虽然视网膜/黄斑激光光凝曾是RVO的金标准治疗手段，但在抗VEGF药物治疗大行其道的今天，该方法仅在特定情况下才作为一线/挽救治疗手段而使用[4, 37]。本共识中以表格的形式对激光光凝的适用条件和光凝方式进行了推荐。强调全视网膜激光光凝（PRP）因无助于改善视功能，也无助于预防非缺血型RVO向缺血型RVO转化[6, 28]，因而当患眼周边部视网膜存在大面积NP时可在远周边NP内行播散光凝，而PRP则仅在眼前后节新生血管形成/NVG发生后方考虑使用[38]。对CRVO，除非患者不具备规律复诊条件，否则不推荐在仅存NP而无眼前节新生血管时即给予预防性PRP[16, 31]；强调因黄斑区格栅样激光光凝无助于改善CRVO患眼的视功能，而不推荐此种光凝方式[6]。对BRVO，黄斑部局部光凝仅在病程晚期，用于因黄斑部侧支循环渗漏伴黄斑水肿、顽固黄斑水肿合并中心凹附近毛细血管扩张患眼的挽救性治疗，病程早期的黄斑水肿仍以抗VEGF药物和（或）糖皮质激素为一线治疗选择[16, 28, 32]。

4　全病程管理的重要性

RVO在起病后的至少2年内均可缓慢自行进展，表现为视网膜NP的进行性扩大甚至非缺血型向缺血型RVO的转化[2]。因此每位RVO患者均应接受定期规律随访直至首诊后至少2年[16]。患者每次复诊时，眼科检查的内容和关注点均与首诊时相同，全面评估RVO的三大并发症（黄斑水肿、眼前后节新生血管和NVG）是否存在/新发，重点寻找非缺血型RVO向缺血型RVO转化的相关证据，并据此给予患眼恰当、规范的治疗。

对存在病因/危险因素的RVO患者，若随访中发现视网膜缺血加重的相关证据，或对连续抗VEGF药物/糖皮质激素缓释剂治疗反应不佳的黄斑水肿患者，还应强调重新评估病因/危险因素的重要性[16]，确保相关因素已被充分发掘并已得到充分恰当的管理和控制，进而从根本上改善此类患者的长期视功能预后。

5　小结

《中国视网膜静脉阻塞临床诊疗路径专家共识》从首诊评估、开展诊疗至长期随访等RVO临床诊疗的全过程均提供了全面和详实的推荐建议，有助于基层眼科医师和眼科全科医师对RVO患者的综合管理和处置。随着眼底影像学技术的进步，更多新型药物的涌现，以及对该病发病机制和自然病程更为全面深入的认识，该共识仍有进一步更新拓展的空间，以期为改善RVO患者的长期视功能预后提供更多帮助。

利益冲突　所有作者均声明不存在利益冲突

6　参考文献

[1] Romano F, Lamanna F, Gabrielle PH, et al. Update on retinal vein occlusion[J]. Asia Pac J Ophthalmol (Phila), 2023, 12(2): 196-210. DOI: 10.1097/APO.0000000000000598.

[2] 赵明威, 苗恒. 视网膜静脉阻塞诊疗重在全病程管理[J]. 中华眼科杂志, 2020, 56(4): 246-249. DOI: 10.3760/cma.j.cn112142-20200207-00052.
Zhao MW, Miao H. Whole course management is the key to retinal vein occlusion[J]. Chin J Ophthalmol, 2020, 56(4): 246-249. DOI: 10.3760/cma.j.cn112142-20200207-00052.

[3] 中华医学会眼科学分会眼底病学组, 中国医师协会眼科医师分会眼底病专业委员会. 中国视网膜静脉阻塞临床诊疗路径专家共识[J]. 中华眼底病杂志, 2024, 40(2): 175-185. DOI: 10.3760/cma.j.cn511434-20240201-00056.
Fundus diseases Group, Ophthalmology Branch of Chinese Medical Association, Ophthalmology Branch ofChinese Medical Doctor Association, Professional Committee of Fundus Diseases. Expert consensus on clinical diagnosis and treatment path of retinal vein occlusion in China[J]. Chin J Ocul Fundus Dis, 2024, 40(2): 175-185. DOI: 10.3760/cma.j.cn511434-20240201-00056.

[4] Flaxel CJ, Adelman RA, Bailey ST, et al. Retinal vein occlusions preferred practice pattern®[J]. Ophthalmology, 2020, 127(2): 288-320. DOI: 10.1016/j.ophtha.2019.09.029.

[5] Khayat M, Williams M, Lois N. Ischemic retinal vein occlusion: characterizing the more severe spectrum of retinal vein occlusion[J]. Surv Ophthalmol, 2018, 63(6): 816-850. DOI: 10.1016/j.survophthal.2018.04.005.

[6] Central Vein Occlusion Study Group. Central vein occlusion study of photocoagulation therapy. Baseline findings[J]. Online J Curr Clin Trials, 1993, 95: 1.

[7] Nicholson L, Vazquez-Alfageme C, Patrao NV, et al. Retinal nonperfusion in the posterior pole is associated with increased risk of neovascularization in central retinal vein occlusion[J]. Am J Ophthalmol, 2017, 182: 118-125. DOI: 10.1016/j.ajo.2017.07.015.

[8] Thomas AS, Thomas MK, Finn AP, et al. Use of the ischemic index on widefield fluorescein angiography to characterize a central retinal vein occlusion as ischemic or nonischemic[J]. Retina, 2019, 39(6): 1033-1038. DOI: 10.1097/IAE.0000000000002126.

[9] An W, Han J. Research progress of UWFFA and OCTA in retinal vein occlusion: a review[J]. Eur J Ophthalmol, 2021, 31(6): 2850-2855. DOI: 10.1177/11206721211027411.

[10] Tsai G, Banaee T, Conti FF, et al. Optical coherence tomography angiography in eyes with retinal vein occlusion[J]. J Ophthalmic Vis Res, 2018, 13(3): 315-332. DOI: 10.4103/jovr.jovr_264_17.

[11] Branch Vein Occlusion Study Group. Argon laser scatter photocoagulation for prevention of neovascularization and vitreous

hemorrhage in branch vein occlusion. A randomized clinical trial[J]. Arch Ophthalmol, 1986, 104(1): 34-41. DOI: 10.1001/archopht.1986.01050130044017.

[12] Terelak-Borys B, Skonieczna K, Grabska-Liberek I. Ocular ischemic syndrome-a systematic review[J]. Med Sci Monit, 2012, 18(8): 138-144. DOI: 10.12659/msm.883260.

[13] Chen TY, Uppuluri A, Zarbin MA, et al. Risk factors for central retinal vein occlusion in young adults[J]. Eur J Ophthalmol, 2021, 31(5): 2546-2555. DOI: 10.1177/1120672120960333.

[14] Deobhakta A, Chang LK. Inflammation in retinal vein occlusion[J/OL]. Int J Inflam, 2013, 2013: 438412[2013-04-03]. https://pubmed.ncbi.nlm.nih.gov/23653882/. DOI: 10.1155/2013/438412.

[15] Zhong P, He M, Yu H, et al. A meta-analysis of cardiovascular events associated with intravitreal anti-VEGF treatment in patients with retinal vein occlusion[J]. Curr Eye Res, 2020, 45(5): 615-622. DOI: 10.1080/02713683.2019.1687727.

[16] Schmidt-Erfurth U, Garcia-Arumi J, Gerendas BS, et al. Guidelines for the management of retinal vein occlusion by the European Society of Retina Specialists (EURETINA)[J]. Ophthalmologica, 2019, 242(3): 123-162. DOI: 10.1159/000502041.

[17] Gao S, Zhang Y, Li X, et al. Comparative efficacy of pharmacotherapy for macular edema secondary to retinal vein occlusion: a network meta-analysis[J/OL]. Front Pharmacol, 2021, 12: 752048[2021-12-08]. https://pubmed.ncbi.nlm.nih.gov/34955825/. DOI: 10.3389/fphar.2021.752048.

[18] Sun Z, Zhou H, Lin B, et al. Efficacy and safety of intravitreal conbercept injections in macular edema secondary to retinal vein occlusion[J]. Retina, 2017, 37(9): 1723-1730. DOI: 10.1097/IAE.0000000000001404.

[19] Wei W, Weisberger A, Zhu L, et al. Efficacy and safety of ranibizumab in Asian patients with branch retinal vein occlusion: results from the Randomized BLOSSOM Study[J]. Ophthalmol Retina, 2020, 4(1): 57-66. DOI: 10.1016/j.oret.2019.08.001.

[20] Chen X, Hu TM, Zuo J, et al. Intravitreal conbercept for branch retinal vein occlusion induced macular edema: one initial injection versus three monthly injections[J]. BMC Ophthalmol, 2020, 20(1): 225. DOI: 10.1186/s12886-020-01494-x.

[21] Zeng HY, Liu Q, Li XX, et al. One-year efficacy of intravitreal conbercept injection for macular oedema secondary to central retinal vein occlusion in Chinese patients[J]. Eye (Lond), 2020, 34(8): 1459-1464. DOI: 10.1038/s41433-020-0827-y.

[22] Chengdu Kanghong Biotech Co. L. 2017. Conbercept ophthalmic injection for patients of central retinal vein occlusion (CRAVE)[EB/OL]. [2022-07-13]. https://www.clinicaltrials.gov/ct2/show/study/NCT03223714.

[23] Chengdu Kanghong Biotech Co. L. 2017. Conbercept ophthalmic injection for patients with macular edema caused by branch retinal vein occlusion (BRAVE)[EB/OL]. [2022-06-13]. https://www.clinicaltrials.gov/ct2/show/study/NCT03108352.

[24] Mushtaq Y, Mushtaq MM, Gatzioufas Z, et al. Intravitreal fluocinolone acetonide implant (ILUVIEN®) for the treatment of retinal conditions. A review of clinical studies[J]. Drug Des Devel Ther, 2023, 17: 961-975. DOI: 10.2147/DDDT.S403259.

[25] Coelho J, Pessoa B, Meireles A. Long-term management of non-ischemic central retinal vein occlusion with fluocinolone acetonide intravitreal implant 190 mug (ILUVIEN®)[J/OL]. Ther Adv Ophthalmol, 2019, 11: 2515841418820755[2019-01-05]. https://pubmed.ncbi.nlm.nih.gov/30643869/. DOI: 10.1177/2515841418820755.

[26] Jain N, Stinnett SS, Jaffe GJ. Prospective study of a fluocinolone acetonide implant for chronic macular edema from central retinal vein occlusion: thirty-six-month results[J]. Ophthalmology, 2012, 119(1): 132-137. DOI: 10.1016/j.ophtha.2011.06.019.

[27] Haller JA, Bandello F, Belfort R Jr, et al. Randomized, sham-controlled trial of dexamethasone intravitreal implant in patients with macular edema due to retinal vein occlusion[J]. Ophthalmology, 2010, 117(6): 1134-1146. DOI: 10.1016/j.ophtha.2010.03.032.

[28] The Central Vein Occlusion Study Group M. Evaluation of grid pattern photocoagulation for macular edema in central vein occlusion[J]. Ophthalmology, 1995, 102(10): 1425-1433. DOI: 10.1016/s0161-6420(95)30849-4.

[29] The Central Vein Occlusion Study Group N. A randomized clinical trial of early panretinal photocoagulation for ischemic central vein occlusion[J]. Ophthalmology, 1995, 102(10): 1434-1444. DOI: 10.1016/S0161-6420(95)30848-2.

[30] The Branch Vein Occlusion Study Group. Argon laser photocoagulation for macular edema in branch vein occlusion[J]. Am J Ophthalmol, 1984, 98(3): 271-282. DOI: 10.1016/0002-9394(84)90316-7.

[31] Mohamed Q, McIntosh RL, Saw SM, et al. Interventions for central retinal vein occlusion: an evidence-based systematic review[J]. Ophthalmology, 2007, 114(3): 507-519. DOI: 10.1016/j.ophtha.2006.11.011.

[32] McIntosh RL, Mohamed Q, Saw SM, et al. Interventions for branch retinal vein occlusion: an evidence-based systematic review[J]. Ophthalmology, 2007, 114(5): 835-854. DOI: 10.1016/j.ophtha.2007.01.010.

[33] Sangroongruangsri S, Ratanapakorn T, Wu O, et al. Comparative efficacy of bevacizumab, ranibizumab, and aflibercept for treatment of macular edema secondary to retinal vein occlusion: a systematic review and network meta-analysis[J]. Expert Rev Clin Pharmacol, 2018, 11(9): 903-916. DOI: 10.1080/17512433.2018.1507735.

[34] Casselholm de Salles M, Amren U, Kvanta A, et al. Injection frequency of aflibercept versus ranibizumab in a treat-and-extend regimen for central retinal vein occlusion: a randomized clinical trial[J]. Retina, 2019, 39(7): 1370-1376. DOI: 10.1097/IAE.0000000000002171.

[35] Liu W, Li Y, Cao R, et al. A systematic review and meta-analysis to compare the efficacy of conbercept with ranibizumab in patients with macular edema secondary to retinal vein occlusion[J/OL]. Medicine (Baltimore), 2020, 99(21): e20222[2020-05-22]. https://pubmed.ncbi.nlm.nih.gov/32481293/. DOI: 10.1097/MD.0000000000020222.

[36] Massa H, Georgoudis P, Panos GD. Dexamethasone intravitreal implant (OZURDEX®) for macular edema secondary to noninfectious uveitis: a review of the literature[J]. Ther Deliv, 2019, 10(6): 343-351. DOI: 10.4155/tde-2019-0024.

[37] Regnier SA, Larsen M, Bezlyak V, et al. Comparative efficacy and safety of approved treatments for macular oedema secondary to branch retinal vein occlusion: a network meta-analysis[J/OL]. BMJ Open, 2015, 5(6): e007527[2015-06-05]. https://pubmed.ncbi.nlm.nih.gov/26048209/. DOI: 10.1136/bmjopen-2014-007527.

[38] 中华医学会眼科学分会青光眼学组. 中国新生血管性青光眼诊疗专家共识(2019年)[J]. 中华眼科杂志, 2019, 55(11): 814-817. DOI: 10.3760/cma.j.issn.0412-4081.2019.11.005.
Glaucoma Group, Society of Ophthalmology, Chinese Medical Association. Expert consensus on diagnosis and treatment of neovascular glaucoma in China (2019)[J]. Chin J Ophthalmol, 2019, 55(11): 814-817. DOI: 10.3760/cma.j.issn.0412-4081.2019.11.005.

（收稿日期：2024-02-18）
（本文编辑：杨婷婷）