

自体肝素化全血辅助内界膜撕除的短期评价

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Short-term study of autologous heparinized whole blood-assisted internal limiting membrane peeling for macular hole repair

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Abstract

• **AIM:** To evaluate the efficacy of autologous heparinized whole blood in assisting internal limiting membrane (ILM) peeling by coating the ILM for idiopathic macular hole (IMH) repair.

• **METHODS:** Six patients (7 eyes) with IMH were enrolled in this study. After standard vitrectomy, autologous heparinized whole blood was applied to cover the macula and to coat the surface of the macular area in the fluid-filled vitreous cavity. The redundant blood was removed and only a very thin film of blood was left on the macular area. The blood-coated ILM was removed by forceps.

• **RESULTS:** All 7 eyes in 6 patients completed at least 3 months of follow-up. The ILM were coated by autologous heparinized whole blood, removed without difficulty. The whole blood highlighted the contrast of the coated and non-coated areas during the ILM peeling procedure. The IMH were closed in all surgical eyes with a single surgery. No toxic fundus changes were observed during follow-up.

• **CONCLUSION:** Autologous heparinized whole blood coat the ILM and facilitate visibility during ILM peeling. Autologous heparinized whole blood is a cost-effective and useful tool for assisting IMH surgery.

• **KEYWORDS:** idiopathic macular hole; heparinized whole blood; internal limiting membrane; staining

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摘要

目的:评估自体肝素化全血在黄斑裂孔修补术中对视网膜内界膜(internal limiting membrane, ILM)染色的功效。

方法:对连续6例7眼特发性黄斑裂孔(idiopathic macular hole, IMH)患者实施自体肝素化全血 ILM 染色,重点观察全血染色是否有助于 ILM 撕除。玻璃体切割后,贴近黄斑区视网膜滴自体肝素化全血数滴,移走多余的血液,仅在黄斑区保留一层薄的血膜,然后进行环形撕除。

结果:所有6例7眼患者均完成至少术后3mo的随访,平均随访时间5.7mo,术中 ILM 容易被全血覆盖,撕除过程顺利,覆盖区和无覆盖区形成鲜明对比。所有黄斑裂孔均经一次手术闭合,术中及术后无并发症发生。

结论:自体肝素化全血 ILM 染色,提高了 ILM 可见度,相对于目前常用的 ILM 染色剂,全血辅助 ILM 撕除具有节俭、高效和实用的特点。

关键词:特发性黄斑裂孔;肝素化全血;内界膜;染色

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0 引言

自 Kelly 等^[1]率先报道借助玻璃体切割闭合特发性黄斑裂孔(idiopathic macular hole, IMH)以来,随着人们对 IMH 发病机制的认识加深和与之相关手术设备、器械的发展和改进,针对 IMH 的手术方式也发生了显著变化。其中 ILM 撕除已经被研究证明不仅有助于提高裂孔的闭合率,且还具有减少黄斑裂孔再开放的作用^[2,3]。然而,对于菲薄的 ILM 而言,在非染色下进行撕除仍然具有挑战性。吲哚青绿(indocyanine green, ICG)染色尽管被广泛应用,但人们对其潜在的视网膜毒性仍然心有余悸^[4-6];台盼蓝(Trypan blue)虽被人们认为相对安全,但也有研究证明其对视网膜的毒性,并且其染色效果也并不令人满意^[7,8]。曲安奈德作为染色剂也面临上述相似的问题^[9],此外,作为皮质类固醇药物,人们有理由担心它对黄斑裂孔闭合的不良影响。为此,2008年 McCannel^[10]率先将自体肝素化全血应用于 ILM 染色,本文将对我们 IMH 手术中使用自身肝素化全血辅助染色的短期效果进行总结。

1 对象和方法

1.1 对象 自2010-07/2011-01 我院眼科共对6例7眼IMH患者实施自体肝素化全血辅助内界膜撕除,其中男2例,女4例,平均年龄58.4岁。所有IMH的诊断及分期均依据患者的眼底所见,特别是光学相干断层扫描(optical coherence tomography, OCT)检查,同时除外诸如眼外伤及眼部手术、眼内炎症、高度近视等有可能导致继发黄斑病变的因素。患者在手术室于手术前从肘前静脉抽取大约2mL血液至无菌肝素化真空采血管中(WACUETTE, Made in Austria)。

1.2 方法 本组所有患者均接受了23G玻璃体切割手术,在完成玻璃体切割,确认视盘及黄斑区周围无玻璃体皮质残留后(3例进行了曲安奈德染色),降低眼内灌注,将肝素化全血数滴滴于黄斑区血管弓范围内(图1A),采用笛针将黄斑区过厚的血液移出,仅残留一层菲薄的血膜覆盖在黄斑区血管弓范围内(图1B),然后按照常规的ILM撕除进行操作(图1C, D),残余在黄斑区视网膜表面的血液在ILM剥离后被转移干净,完成气液交换,嘱患者后俯卧5~7d。其中有2例3眼同时接受了Phaco + IOL手术。

2 结果

在全血染色过程中,血液被滴注在拟定区域并沉降,而没有在充满液体玻璃体腔内扩散,与背景视网膜形成良好的对比(图1A)。在ILM撕除过程中,已经撕除的区域和尚未撕除的仍被全血覆盖的区域非常容易辨别,而浮起或脱离的ILM边缘也由于有全血的附着而容易再次被眼内镊夹取。本组病例属于3期IMH者3眼,4期者4眼,黄斑裂孔直径848~1510(平均1168) μm 。6例患者术后随访3~9(平均5.7)mo。所有7眼术后1wk, OCT扫描均证实黄斑裂孔闭合,至末次随访黄斑裂孔未见开放。

3 讨论

尽管ICG染色已在临床广泛应用,但鉴于其对视网膜组织毒性的担忧,特别ICG直接与黄斑区组织接触,且会在视网膜上残留很长时间,因此人们始终没有停止对ILM染色剂的探索和改进。虽然有学者尝试在ICG辅助染色时将ICG的浓度降低或者用其他诸如黏弹剂、全氟化碳或者自体全血来阻挡ICG与RPE的直接接触,但仍避免不了有少量ICG残留在视网膜表面^[11-14]。随后的替代染色剂如台盼蓝和曲安奈德,也被发现对视网膜组织有潜在毒性作用^[7-9]且前者价格相对昂贵。

一项灵长类动物研究表明短期使用肝素化全血对视网膜无害^[15],对体外培养的人类RPE细胞的实验研究也没呈现毒性^[12],众多临床报道似乎也给予了支持和验证^[16-18]。在本组病例中,术后1wk, OCT检查发现黄斑裂孔闭合且至末次随访,未有裂孔重新开放病例。我们虽没有对本组患者进行黄斑功能的客观测评,但从患者的主观感觉和中心视力来看,均较术前有不同程度的改善(限于样本数量较少和随访时间相对较短,没有进行统计学检验)。至于全血染色后是否有助于ILM撕除操作,术者体会与ICG染色后的操作没有明显差异,在ILM撕除过程中,全血覆盖与未覆盖区能够形成对比,未撕除ILM的边界也很容易界定,不存在学习曲线问题。另外,本组病例虽没有对撕除组织进行组织学检查,但术者根据染色前黄

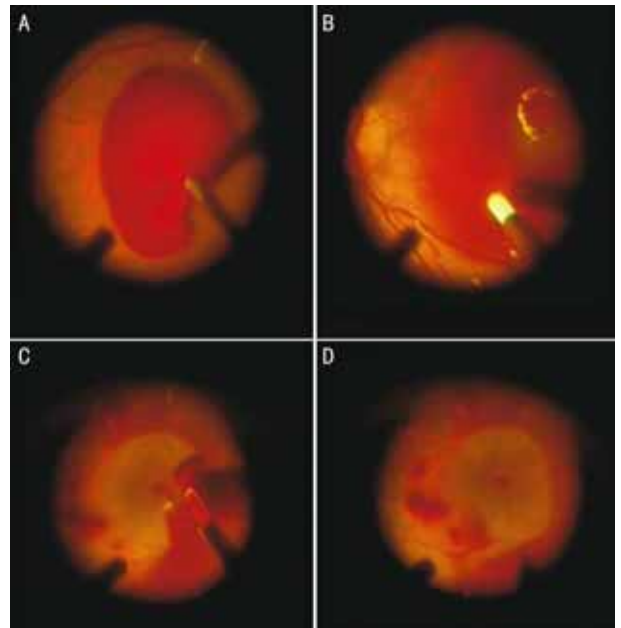


图1 自体肝素化全血辅助内界膜撕除 A:全血被缓慢滴注在黄斑血管弓视网膜表面;B:过厚的血液被笛针移出眼外;C:正在撕除被全血附着的ILM;D:完成ILM撕除后,圆形撕除区与周围形成良好对比。

斑区玻璃体已经被彻底清除以及术中所获得的膜状光滑组织的事实,仍然可以推断所撕除的即为被全血覆盖的ILM, Lai等^[18]曾对此全血染色撕除的组织进行过电镜观察,证实ILM的存在。

全血辅助ILM撕除的优势在于取材方便和近乎无费用,并且可以反复进行;ILM撕除后残留的少量血液也可非常容易的被移出玻璃体腔外。理论上,对于全血辅助撕除不成功的患者,更可以随时更换为ICG等染色剂进行辅助染色。鉴于全血染色与ICG染色有所不同,血细胞仅仅是覆盖ILM表面,而非选择性对ILM的染色^[18],因此在操作过程中,如何尽可能减少玻璃体腔内液流对沉降全血的扰动显得尤为必要,这可以通过降低灌注高度、减少玻璃体腔内液体过度溢出和不必要的器械反复进出以及采用23G甚至25G来实现。

尽管本研究存在如下缺憾,如患者数量较少,缺乏对照和长期随访,但从本研究的主要观察指标即全血是否有助于协助ILM撕除角度来看,我们认为作为一种可供选择的染色替代技术,自体肝素化全血有助于ILM顺利撕除。另外尚需注意到该操作本身还牵涉到血液采集及玻璃体腔内应用可能增加感染的风险,因此,进一步随机对照和大样本的研究显得尤为必要。

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