

# 玻璃体切割联合内界膜翻转覆盖术治疗高度近视黄斑裂孔性视网膜脱离

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## Clinical efficacy of vitrectomy combined with inverted internal limiting membrane flap technique for macular hole retinal detachment of high myopia

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## Abstract

• AIM: To evaluate the effectiveness of pars plana vitrectomy (PPV) combined with inverted internal limiting membrane (ILM) flap technique for macular hole retinal detachment (MHRD) of high myopia.

• METHODS: This was a retrospective case series. Totally 27 patients (27 eyes) who were diagnosed with MHRD of high myopia and underwent vitrectomy combined with inverted ILM flap covering technique were enrolled in this study. The diopter was  $\geq -6.00D$  and axial length was  $\geq 26mm$ . The mean age was  $53.69 \pm 7.23$  years. And there 9 males and 18 females. The logarithm of the minimum angle of resolution (LogMAR) best-corrected visual acuity (BCVA) was  $1.41 \pm 0.28$ . All patients were performed PPV with inverted ILM flap, resected the vitreous gel and cortex completely. Bright blue G stained the ILM around the fovea. The ILM was peeled off around the MH, and some portion of the ILM flap was left attached to the edge of the MH. Covering the MH with the ILM flap. Then,  $C_3F_8$  gas or silicone oil was injected into the vitreous cavity. The mean follow-up was more than 6mo and BCVA, MH closure, retinal

reattachment, complications were retrospectively observed.

• RESULTS: After surgery, visual acuity improved in 21 eyes (78%), unchanged in 4 eyes (15%), decreased in 2 eyes (7%). The mean LogMAR BCVA was  $0.84 \pm 0.40$ , the difference was significant ( $t = 7.32, P < 0.05$ ). The macular hole closure rate was 89% (24 eyes) and retinal reattachment rate was 93% (25 eyes). No severe complication was observed.

• CONCLUSION: PPV combined with inverted internal limiting membrane flap is an effective and safe management for the MHRD of high myopia.

• KEYWORDS: myopia; retinal perforations; retinal detachment; vitreoretinal surgery

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## 摘要

目的:观察玻璃体切割(pars plana vitrectomy, PPV)联合内界膜(internal limiting membrane, ILM)覆盖术治疗高度近视黄斑裂孔性视网膜脱离(macular hole retinal detachment, MHRD)的疗效。

方法:回顾性病例研究。收集2013-07/2017-11在我院就诊,屈光度数 $\geq -6.00D$ ,眼轴长度 $\geq 26mm$ ,经眼底检查确诊为高度近视MHRD的患者27例27眼,其中男9例9眼,女18例18眼,年龄41~70(平均 $53.69 \pm 7.23$ )岁,最佳矫正视力(best-corrected visual acuity, BCVA)为 $1.41 \pm 0.28$ (LogMAR)。所有患者均行经睫状体平坦部23G玻璃体切割术,伴有晶状体混浊影响手术者同时行晶状体咬切术。术中彻底切除玻璃体后皮质,亮蓝G染色黄斑区ILM,环形剥除黄斑中心凹周围血管弓内ILM,残留黄斑裂孔(MH)边缘少量ILM,将其反转覆盖于MH上,并行 $C_3F_8$ 或硅油填充。平均随访时间6mo以上。观察所有患者末次随访时BCVA、MH闭合、视网膜复位和眼部并发症情况。

结果:患者术后BCVA提高21眼(78%),视力不变4眼(15%),视力下降2眼(7%)。平均BCVA为 $0.84 \pm 0.40$ (LogMAR),与术前比较差异有统计学意义( $t = 7.32, P < 0.05$ )。术后MH闭合24眼(89%),视网膜解剖复位25眼(93%),所有患者无严重眼部和全身并发症。

结论:PPV联合ILM覆盖术治疗高度近视MHRD安全有效,可改善视力,裂孔闭合率、视网膜复位率高。

关键词:近视;视网膜穿孔;视网膜脱离;玻璃体视网膜手术

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## 0 引言

黄斑裂孔性视网膜脱离 (macular hole retinal detachment, MHRD) 是高度近视患者的常见并发症,如治疗不及时,往往导致不可逆性视网膜损伤,严重影响视力<sup>[1]</sup>。目前公认的手术方式是玻璃体切割手术 (pars plana vitrectomy, PPV) 联合内界膜 (internal limiting membrane, ILM) 剥除术,可达到较好的疗效,视网膜复位率高<sup>[2-5]</sup>,然而,由于高度近视眼的复杂性,常规 PPV 联合 ILM 剥除术黄斑裂孔闭合率低。近来有研究报道,ILM 翻转覆盖术能有效提高黄斑裂孔闭合率<sup>[6-7]</sup>。为了验证其有效性,本研究观察一组高度近视 MHRD 患者 PPV 联合 ILM 翻转覆盖术后视力恢复、MH 闭合、视网膜复位和眼部并发症的情况,现将结果报告如下。

## 1 对象和方法

**1.1 对象** 回顾分析 2013-07/2017-11 在我院就诊行 PPV 联合 ILM 翻转覆盖术治疗的高度近视 MHRD 患者的临床资料,共 27 例 27 眼纳入研究。其中男 9 例 9 眼,女 18 例 18 眼,年龄 41~70 (平均 53.69±7.23) 岁,病程 5d~3mo (平均 35d)。纳入标准:屈光度数≥-6.00D,眼轴长度≥26mm;经裂隙灯下前置镜检查、B 超、光学相干断层扫描 (optical coherence tomography, OCT) 确诊为高度近视 MHRD 的患者。排除标准:有眼外伤史,葡萄膜炎,玻璃体视网膜手术史,伴有糖尿病等全身系统性疾病,不能完成定期复查者。本研究经医院伦理委员会批准,所有患者均签署知情同意书。

**1.2 方法** 术前所有患者均行 Snellen 视力最佳矫正视力 (best-corrected visual acuity, BCVA)、眼压、裂隙灯下前置镜、三面镜、A/B 超、眼底照相、OCT 检查。为方便统计,我们将视力测量换算为最小分辨角对数 (LogMAR) 视力进行记录。

所有手术均由同一位经验丰富的手术医师完成。手术过程:在局部麻醉下行常规 23G 玻璃体切割术,据患者具体情况和术者经验联合或不联合白内障手术。曲安奈德辅助下彻底清除黄斑部玻璃体后皮质,剥除视网膜前膜,必要时巩膜顶压器辅助下观察周边部视网膜,对变性区行激光光凝或冷冻治疗。玻璃体腔注入适量重水压平后极部视网膜,亮蓝 G 染色 ILM,眼内镊于黄斑上方或颞侧周围血管弓约 3PD 范围内撕开 ILM,保留裂孔边缘不撕脱,制作成 1.5PD 大小 ILM 翻转瓣膜,向下方或鼻侧覆盖于黄斑裂孔 (MH),环形剥除其他象限 ILM。引流视网膜下液,笛针吸除重水,术毕患眼玻璃体腔注入 C<sub>3</sub>F<sub>8</sub> 或硅油至正常眼压。其中, C<sub>3</sub>F<sub>8</sub> 气体填充 8 眼,硅油填充 19 眼,硅油填充患者术后 3~6mo 据患眼视网膜复位情况行玻璃体腔硅油取出术。

术后所有患者均俯卧位休息 7~10d,手术后随访,分别在 1wk, 1, 3, 6mo 采用与术前相同的方法和设备对患者进行检查,行硅油取出术者继续随访 3mo 以上,观察末次随访时患眼 BCVA、视网膜复位、黄斑裂孔闭合情况和眼部并发症发生情况。根据 OCT 检查评价:视网

表 1 手术前后患眼 BCVA 分布

时间	0.4~0.7	0.8~1.1	1.2~1.5	1.6~2.0
术前	1	3	16	7
术后	18	3	4	2

膜神经上皮层与视网膜色素上皮 (retinal pigment epithelium, RPE) 层存在间隙为视网膜未复位,视网膜神经上皮层与 RPE 层无间隙为视网膜复位;黄斑裂孔两端未联结且抬高翘起,有视网膜下液,为裂孔未闭合;裂孔两端贴合于 RPE 层,为裂孔闭合。

统计学分析:采用 SPSS17.0 软件进行统计学分析,BCVA 视力以均数±标准差表示,手术前后视力的比较采用配对样本 *t* 检验。以 *P*<0.05 为差异有统计学意义。

## 2 结果

末次随访,患者 BCVA 提高 21 眼 (78%), 视力不变 4 眼 (15%), 视力下降 2 眼 (7%), 视力分布见表 1。术后 BCVA 为 0.84±0.40, 与术前 BCVA (1.41±0.28) 比较, 差异具有统计学意义 (*t*=7.32, *P*<0.05)。硅油填充者于术后 3~6mo 据情况行玻璃体腔硅油取出术, 术后无复发性视网膜脱离患者。末次随访, 视网膜脱离复位 25 眼 (93%), 黄斑裂孔闭合 24 眼 (89%)。术中所有患者未出现明显眼底出血, 无全身不良反应。术后随访期间眼压高于正常者 4 眼 (15%, 25~34mmHg), 予以局部降眼压治疗后恢复正常。硅油填充者并发白内障 7 眼 (37%), 均于取出硅油时联合白内障手术。所有患者未发生眼内炎和其他严重并发症。

## 3 讨论

高度近视 MHRD 的产生主要是由于黄斑部视网膜受到切线方向的牵拉, 治疗的关键在于解除牵拉, 封闭裂孔。由于高度近视眼伴随着长眼轴、后巩膜葡萄肿、黄斑部脉络膜萎缩等复杂病变, 使得常规 PPV 联合 ILM 剥除手术后视力恢复和裂孔闭合率不甚理想, 其黄斑裂孔闭合率 10%~91%<sup>[8]</sup>。自 2010 年, Michalewska 等<sup>[9]</sup>报道采用 ILM 翻转术治疗大孔径黄斑裂孔后, 陆续有研究使用此方法治疗高度近视 MHRD, 并证实了其有效性, 黄斑裂孔闭合率为 75%~100%<sup>[6-7, 10-14]</sup>。ILM 翻转覆盖术提高裂孔闭合率的机制在于翻转瓣膜在黄斑裂孔表面形成支架结构, 刺激胶质细胞的增生, 促进黄斑裂孔组织的填充, 并为光感受器细胞的重新形成提供构架, 从而促进黄斑裂孔的闭合和视力的提高, 同时, 闭合的 MH 有利于视网膜下液的吸收, 从而促进视网膜的解剖复位<sup>[9]</sup>。

本研究回顾性分析 PPV 联合 ILM 翻转覆盖术治疗高度近视 MHRD 的疗效, 其中黄斑裂孔闭合率为 89%, 视网膜脱离复位率为 93%, 均达到较高水平, 且手术后患者平均视力有所提高。我们认为 ILM 翻转覆盖术在提高高度近视 MHRD 患者视力和黄斑裂孔闭合率上疗效显著。术中使用气体填充或硅油填充根据手术医师经验决定, 一般情况下, 硅油填充能延长裂孔修复时间, 利于黄斑裂孔的闭合。对于对侧眼视功能欠佳或年老患者术后不能严格俯卧位休息的患者多采用硅油填充<sup>[8]</sup>。本研究显示, 硅油填充增加了术后晶状体混浊的发生, 可于取油时联合白内障手术以获得最佳视力。术后患者视力预后差异大, 与术前比较, 视力提高 21 眼, 不变者 4 眼, 下降者 2 眼, 其差异可能与黄斑裂孔大小、病程

(裂孔发生时间、视网膜脱离时间)和视网膜脉络膜萎缩程度相关。

目前,PPV联合ILM翻转覆盖术逐渐成为治疗高度近视MHRD的主要术式,并不断有所创新,衍生出单层瓣膜覆盖法、多层瓣膜覆盖法。近来有研究报道,单纯制作ILM而不进行黄斑裂孔的覆盖同样能实现裂孔的闭合<sup>[15]</sup>。由于该术式的研究形式单一,疗效评价不尽相同,其有效性有待进一步探索。本研究的不足之处为:回顾性非随机对照、样本量小、随访时间短、评价指标局限,尚需大样本、多中心、前瞻性研究,延长随访时间以评价远期疗效,观察黄斑部显微结构的变化和全面视功能的检查。

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