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超声乳化人工晶状体植入术治疗高度近视合并白内障的效果*

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摘要 目的:探讨超声乳化人工晶状体植入术在高度近视合并白内障中的应用及对中央角膜厚度(CCT)、角膜内皮细胞计数(CEC)、图像视觉诱发电位(P-VEP)与黄斑光学相干断层成像(OCT)的影响。**方法:**选择 2014 年 1 月至 2016 年 6 月我院接诊的 96 例高度近视合并白内障患者,通过随机数表法分为观察组(n=48)和对照组(n=48)。对照组行白内障囊外摘出人工晶状体植入术,观察组行超声乳化人工晶状体植入术。手术 1 个月后,比较两组 CCT、CEC、P-VEP、黄斑 OCT、最佳矫正视力以及并发症的发生情况。**结果:**手术后,观察组 CCT、CEC 均明显高于对照组($P<0.05$)。P-VEP 检测结果显示观察组 P100 波振幅明显高于对照组, P100 波潜时显著低于对照组($P<0.05$)。黄斑 OCT 结果显示观察组黄斑中心凹厚度明显低于对照组($P<0.05$);观察组最佳矫正视力明显高于对照组($P<0.05$);观察组并发症的总发生率明显低于对照组 ($P<0.05$)。**结论:**应用超声乳化人工晶状体植入术治疗高度近视合并白内障患者的效果显著,可有效减轻对角膜内皮的损伤,促进视力恢复,提高视觉质量。

关键词:高度近视;白内障;超声乳化术;人工晶状体植入

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Application of Phacoemulsification and Intraocular Lens Implantation in Treatment of High Myopia with Cataract*

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ABSTRACT Objective: To study the application of phacoemulsification and intraocular lens implantation in the treatment of high myopia with cataract and its effects on the central corneal thickness (CCT), corneal endothelial cell count (CEC), pattern visual evoked potential(P-VEP) and macular optical coherence tomography(OCT). **Methods:** 96 patients of high myopia with cataract who were treated from January 2014 to June 2016 in our hospital were selected. According to the random number table, those patients were divided into the observation group (n=48) and the control group (n=48). The control group was treated with extracapsular cataract extraction and intraocular lens implantation, while the observation group was treated with phacoemulsification and intraocular lens implantation. At 1 month after the operation, the CCT, CEC, P-VEP, macular OCT, best corrected visual acuity and complication were compared. **Results:** After operation, the CCT and CEC of observation group were significantly higher than those in the control group ($P<0.05$). The P100 wave amplitude in the observation group were significantly higher than those in the control group, the P100 wave potential in the observation group were significantly lower than those in the control group ($P<0.05$); the macular central thickness in the observation group was significantly lower than those in the control group ($P<0.05$); the best corrected visual acuity in the observation group was significantly higher than those in the control group ($P<0.05$); the incidence of complications in the observation group was significantly lower than those in the control group($P<0.05$). **Conclusion:** Phacoemulsification and intraocular lens implantation was effective for high myopia with cataract, which could effectively reduce the damage of corneal endothelium, promote the visual recovery, improve the visual quality.

Key words: High myopia; Cataract; Phacoemulsification; Intraocular lens implantation

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前言

高度近视合并白内障在中老年人中较为多发,是我国眼科致盲性疾病之一。高度近视患者眼球的病理性结构较为独特,

难以耐受外源性损伤,手术难度大,多数患者术后会出现不同程度的并发症^[1]。且、手术过程中极易改变角膜微环境,在组织饥结构修复上较为困难,局部神经功能衰退,部分患者即便经过手术,视力也不得到令人满意的改善,甚至会持续下降,对生

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活质量造成严重影响^[2]。而最大程度的使手术产生的外源性损伤降低,保持角膜结构正常对提高患者视觉质量具有积极意义。近年来,随着微创技术的不断发展,超声乳化术在眼科治疗中取得了较好的效果^[3,4]。本研究分别应用白内障囊外摘出人工晶状体植入术以及超声乳化人工晶状体植入术治疗高度近视合并白内障患者,探讨了其对角膜细胞、视觉质量的影响。

1 资料与方法

1.1 一般资料

选择2014年1月至2016年6月我院接诊的96例高度近视合并白内障患者。纳入标准:^①晶状体核硬度Ⅱ~Ⅳ级;^②眼压 ≤ 21 mmHg;^③通过泪液分泌试验以及泪膜破裂时间检查结果均正常;^④同意参与此次研究。排除标准^⑤:^①伴有青光眼、视网膜脱离、虹膜炎、角膜疾病等影响术后视力恢复的患者;^②既往有眼外伤或眼部手术史;^③伴有有可能引发眼部疾病的全身性疾病;^④无法耐受手术。通过随机数表法分为观察组和对照组,各48例。观察组(57眼)男26例(32眼),女22例(25眼);年龄45~76岁,平均 (53.48 ± 2.10) 岁;近视病程3~21年,平均 (12.83 ± 2.40) 年;白内障病程1~14年,平均 (7.84 ± 1.32) 年;核硬度分级Ⅱ级21例,Ⅲ级19例,Ⅳ级8例。对照组(55眼)男25例(31眼),女23例(24眼);年龄46~79岁,平均 (53.55 ± 2.04) 岁;近视病程4~23年,平均 (12.90 ± 2.34) 年;白内障病程1~15年,平均 (7.79 ± 1.35) 年;核硬度分级Ⅱ级24例,Ⅲ级17例,Ⅳ级7例。本次研究已获得我院伦理委员会批准,两组一般资料比较差异均无统计学意义($P > 0.05$),具有可比性。

1.2 治疗方法

对照组:球周麻醉使用20 g/L的利多卡因(规格2 mL:20 mg,厂家:辰欣药业股份有限公司,国药准字H20052352),表面麻醉在结膜囊内滴4 g/L倍诺喜眼液(规格20 mL,厂家:参天制药株式会社 Santen Pharmaceutical Co, Ltd, 国药准字J20100128),开睑器开睑,在2点钟的位置,实施透明角膜辅助切口,将11点位置作为中心,行反眉形角巩膜隧道切口,外切口长度大约在5.0~7.0 mm,内切口距离透明角膜缘内的距离大

约为1.0~1.5 mm,长度8.0~9.0 mm,再做一个2.5 mm的前房穿刺口,将粘弹剂注入后,使用撕囊镊进行连续环形撕囊,直径约6.0 mm,充分水分离,娩核,抽取干净晶状体皮质后,再次注入粘弹剂,扩大切口,在囊袋内植入人工晶状体,缝合切口。

观察组:表面麻醉使用4 ng/L的盐酸丙美卡因滴眼液(规格15 mL, 厂家:s.a. ALCON-COUVREUR n.v., 国药准字H20090082),开睑器开睑,使用改良反眉形巩膜隧道外切口,弧顶距离角膜缘大约0.5~1.0 mm的距离,再垂直于主切口,取侧切口进入前房,将粘弹剂注入,进行连续环形撕囊,直径直径5.0~5.5 mm,充分水分离,超声乳化晶状体核,乳化吸出晶状体核碎裂,使用注吸系统,将残留晶状体皮质抽吸,扩大切口,再次在前房注入粘弹剂,在囊袋内植入人工晶状体,水密切口,在结膜囊处常规涂抹典必殊眼膏(规格3.5 g, 厂家:s.a. ALCON-COUVREUR n.v, 国药准字H20080660)。

1.3 观察指标

术后1个月,比较以下结果:^①使用角膜地形图检测中央角膜厚度(CCT),并使用TSWH2SW-7000北京西化仪检测角膜内皮细胞计数(CEC);^②使用德国罗兰 Roland Scan 21 检测图像视觉诱发电位(P-VEP),包括P100波振幅及潜时的变化;^③使用蔡司 Zeiss Cirrus HD- 黄斑光学相干断层成像(OCT)4000型对黄斑中心凹厚度的变化进行检测;^④采用国际标准视力检查表检测最佳矫正视力;^⑤记录并发症的发生情况。

1.4 统计学分析

数据用spss18.0软件包处理,计量资料以均数 $\pm$ 标准差($\bar{x} \pm s$)表示,采用t检验,计数资料采用 χ^2 检验,以 $P < 0.05$ 表示差异具有统计学意义。

2 结果

2.1 两组治疗前后 CCT、CEC 水平的对比

手术前,两组CCT、CEC比较差异无统计学意义($P > 0.05$);手术后,两组CCT较治疗前比较均增加,CEC均减少($P < 0.05$),且观察组CCT、CEC均明显高于对照组($P < 0.05$),见表1。

表1 两组治疗前后 CCT、CEC 水平的对比($\bar{x} \pm s$)

Table 1 Comparison of the CCT and CEC levels before and after treatment between two groups ($\bar{x} \pm s$)

Groups		CCT(μ m)	CEC(mm ²)
Observation group(n=48)	Before operation	538.42 $\pm$ 65.91	2354.12 $\pm$ 276.41
	After operation	692.11 $\pm$ 70.03* [#]	1956.94 $\pm$ 235.13* [#]
Control group(n=48)	Before operation	540.31 $\pm$ 66.24	2358.02 $\pm$ 269.23
	After operation	617.23 $\pm$ 68.71*	1513.27 $\pm$ 211.21*

Note: Compared with the before operation, * $P < 0.05$; compared with the control group, [#] $P < 0.05$.

2.2 两组治疗前后 P-VEP、黄斑 OCT 对比

手术前,两组P-VEP、黄斑OCT比较差异无统计学意义($P > 0.05$);手术后,两组P100波和b波振幅及潜时结果均较治疗前显著改变($P < 0.05$);在P-VEP检测结果中,观察组P100波振幅高于对照组,P100波潜时低于对照组($P < 0.05$);黄斑OCT结果显示,观察组手术后黄斑中心凹厚度低于对照组($P <$

0.05),见表2。

2.3 两组治疗前后最佳矫正视力对比

手术前,两组最佳矫正视力比较差异无统计学意义($P > 0.05$);手术后,两组最佳矫正视力均较手术前明显增加($P < 0.05$),且观察组最佳矫正视力比对照组高($P < 0.05$),见表3。

2.4 两组并发症发生情况比较

观察组角膜水肿、囊膜浑浊、房水浑浊、高眼压并发症的总发生率为 10.42%, 明显低于对照组($P<0.05$), 见表 4。

表 2 两组治疗前后 P-VEP、黄斑 OCT 对比($\bar{x}\pm s$)

Table 2 Comparison of the P-VEP and macular OCT before and after treatment between two groups ($\bar{x}\pm s$)

Groups		P100 wave amplitude(μV)	P100 wave potential(ms)	Macular central thickness(μm)
Observation group(n=48)	Before operation	5.29 $\pm$ 1.24	121.03 $\pm$ 14.50	158.11 $\pm$ 11.26
	After operation	9.30 $\pm$ 1.79* [#]	101.18 $\pm$ 11.49* [#]	176.96 $\pm$ 15.60* [#]
Control group(n=48)	Before operation	5.32 $\pm$ 1.21	120.94 $\pm$ 14.53	157.94 $\pm$ 11.76
	After operation	7.81 $\pm$ 1.46*	114.03 $\pm$ 12.28*	189.84 $\pm$ 16.72*

Note: Compared with the before operation, * $P<0.05$; compared with the control group, [#] $P<0.05$.

表 3 两组治疗前后最佳矫正视力对比($\bar{x}\pm s, D$)

Table 3 Comparison of the best corrected visual acuity before and after treatment between two groups ($\bar{x}\pm s, D$)

Groups		Best corrected visual acuity
Observation group(n=48)	Before operation	0.14 $\pm$ 0.03
	After operation	0.68 $\pm$ 0.06* [#]
Control group(n=48)	Before operation	0.15 $\pm$ 0.02
	After operation	0.39 $\pm$ 0.05*

Note: Compared with the before operation, * $P<0.05$; compared with the control group, [#] $P<0.05$.

表 4 两组并发症发生情况的比较(例, %)

Table 4 Comparison of the incidence of complication between two groups (n, %)

Groups	Corneal edema	Capsular opacity	Aqueous humor opacity	Intraocular hypertension	Total incidence rate
Observation group(n=48)	1(2.08)	2(4.17)	1(2.08)	1(2.08)	5(10.42)*
Control group(n=48)	7(14.58)	3(6.25)	3(6.25)	2(4.17)	15(31.25)

Note: Compared with the control group, * $P<0.05$.

3 讨论

高度近视合并白内障患者由于眼轴变长, 晶状体囊袋较薄, 会造成玻璃体腔以及巩膜葡萄肿的增加, 且具有较高的周边视网膜变性率, 极易增加手术风险, 尤其增加视网膜脱落的发生率^[7,8]。高度近视合并白内障患者手术后发生黄斑区病变、角膜水肿的概率明显比普通白内障患者更高^[9,10]。因此, 选择安全有效的手术方式至关重要。白内障超声乳化术是基于白内障现代囊外手术所发展而成的, 其优点是切口小、术后愈合快、角膜散光小等, 术中可维持前房稳定, 对前部组织的影响较少, 而且可使术中玻璃体移位以及对视网膜造成的影响降低, 术后可更早期的恢复视力, 目前该术式也在临床上得到逐渐开展^[11,12]。

有研究显示高度近视合并白内障患者实施手术过程中极易造成患者角膜内皮细胞的丢失^[13]。而角膜内皮细胞具有保护角膜房水的作用, 若细胞遭受到损伤或者功能降低, 则会导致房水深入到角膜基质, 造成角膜水肿、增厚等现象, 不仅对增加了患者的痛苦, 还会影响视力的恢复^[14,15]。因此, 手术过程中尽量减少对角膜内皮细胞的损伤, 在促进术后视力恢复中具有积极意义。本研究结果显示两种手术方式的患者术后 CEC 均有所降低, 证实手术的确会造成患者角膜内皮细胞的丢失, 但应用超声乳化人工晶状体植入的患者在术后 CEC 的表达明显较

高, 且 CCT 也较高, 表明该方式对角膜内皮的损伤较低, 可更好的使角膜的正常生理功能得以维持。Srinivasan B 等^[16]研究也证实由于超声乳化术是在相对密闭的状态下操作, 其具有操作时间短、侵袭性小的优点, 可使前房微环境得到较好的维持, 并可减少手术器械、外界环境对眼组织所产生的损伤或压迫。此外, 在术后最佳矫正视力中, 应用超声乳化人工晶状体植入的患者也明显较高, 且并发症较低, 显示其在减轻角膜内皮损伤后, 更有利于术后视力的恢复。

视觉诱发电位是使用图形或光刺激视网膜后, 由神经节细胞突触 - 轴索、视神经到枕叶视皮质视觉产生过程中所发生的电活动, 其可克服浑浊的障碍, 在检测视觉功能中可靠性高^[17]。而在视觉诱发电位中, P-VEP 可有效的反应黄斑到视皮层的功能。Soares TS 等^[18]研究证实白内障患者术后视觉恢复较好的患者中, P100 波振幅明显较高, 而 P100 波潜时较低, 在评估术后视觉功能中具有积极的指导价值。OCT 是种非接触光学影像学诊断技术, 可通过精细的空间尺度检查到眼睛后极部组织, 且检查时不会受到瞳孔直径、眼球像差、参考平面等影响, 在目前定量分析视网膜内部结构中已广泛应用^[19]。因此, 对高度近视合并白内障患者术前术后 P-VEP 及 OCT 检查可更加客观、直接对术后恢复进行评价。本研究结果显示应用超声乳化人工晶状体植入术的患者 P100 波振幅较高, P100 波潜时较

低,且黄斑中心凹厚度更低,显示该方式可极大程度上阻止或延缓眼底病变的发展,安全系数较高,原因和超声乳化人工晶状体植入术具有创伤小、并发症低等优点有关,有利于视觉质量的提高^[20]。

综上所述,超声乳化人工晶状体植入术治疗高度近视合并白内障患者的效果显著,可有效减轻对角膜内皮的损伤,促进视力恢复,提高视觉质量。

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