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## 玻璃体切除术后高度近视合并白内障患者行白内障摘除联合人工晶体植入术后悬韧带及囊袋的变迁

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**[摘要]** 目的: 观察玻璃体切除术后高度近视合并白内障患者行白内障摘除联合人工晶体植入术后悬韧带及囊袋的变迁。方法: 选取2016年6月至2018年3月河南省省立医院收治的玻璃体切除术后高度近视合并白内障患者80例, 依据白内障摘除联合人工晶体植入术是否联合囊袋张力环(capsular tension ring, CTR)植入将这些患者分为植入CTR组(植入组,  $n=40$ )和未植入CTR组(未植入组,  $n=40$ ), 统计分析2组患者术后1周、1个月、3个月的前囊开口直径、视力、眼压、术后并发症发生情况。结果: 两组患者术后1周、1个月、3个月的前囊开口直径均逐渐增大( $P<0.05$ ), 术后1周、1个月、3个月植入组患者的前囊开口直径均显著大于未植入组( $P<0.05$ )。两组患者术后1周、1个月、3个月的视力均逐渐提升( $P<0.05$ ), 术后1周、1个月、3个月植入组患者的视力均显著高于未植入组( $P<0.05$ )。两组患者术后1周、1个月、3个月的眼压均逐渐降低( $P<0.05$ ); 术后1周、1个月、3个月植入组患者的眼压均显著低于未植入组( $P<0.05$ )。植入组患者的术后并发症发生率5.0%(2/40)显著低于未植入组45.0%(18/40,  $P<0.05$ )。结论: 玻璃体切除术后高度近视合并白内障患者行白内障摘除联合人工晶体植入术联合CTR植入较未联合CTR植入效果好, 更能有效增大患者的前囊开口直径, 提升患者视力, 降低患者眼压及术后并发症发生率, 值得在临床推广使用。

**[关键词]** 玻璃体切除术; 高度近视; 白内障摘除联合人工晶体植入术; 悬韧带; 囊袋

## Changes of suspensory ligament and capsular bag after vitrectomy in patients with high myopia and cataract after cataract extraction combined with intraocular lens implantation

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**Abstract** **Objective:** To observe the changes of suspensory ligament and capsular bag after cataract extraction and intraocular lens implantation in patients with high myopia and cataract after vitrectomy. **Methods:** A total of 80

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patients with high myopia and cataract after vitrectomy were enrolled in our hospital from June 2016 to March 2018. The patients were divided into the implanted tension ring group (implanted group,  $n=40$ ) and a non-implantation tension ring group (non-implantation group,  $n=40$ ), according to whether cataract extraction combined with intraocular lens implantation combined with tension ring implantation. Statistical analysis was performed between two groups at postoperative 1 week, 1 month, and 3 months. The anterior capsule opening diameter, visual acuity, intraocular pressure, and postoperative complications occurred. **Results:** The diameter of the anterior capsule in two groups was increased gradually at 1 and 3 months after operation ( $P<0.05$ ). The diameter of the anterior capsule at 1 week, 1 month and 3 months after the operation was significantly greater than that in the non-implantation group ( $P<0.05$ ). The visual acuity in two groups after 1 and 3 months was increased gradually ( $P<0.05$ ). The visual acuity of the patients at 1 week, 1 month and 3 months after the operation was significantly higher than that in the non-implantation group ( $P<0.05$ ). The intraocular pressure in two groups after 1 and 3 months was decreased ( $P<0.05$ ), and the intraocular pressure of the patients in the implanted group at 1 week, 1 month and 3 months after the operation was significantly lower than that in the non-implanted group ( $P<0.05$ ). The incidence of postoperative complications in the implanted group was 5% (2/40), which was significantly lower than 45% (18/40) in the non-implanted group ( $P<0.05$ ). **Conclusion:** Cataract extraction, intraocular lens implantation combined with tension ring implantation in patients with high myopia and cataract after vitrectomy is more efficacious than that without the implantation of tension ring, which can effectively increase the diameter of the anterior capsule opening and improve the visual acuity. It can also reduce the intraocular pressure and the incidence of postoperative complications.

**Keywords** vitrectomy; high myopia; cataract extraction combined with intraocular lens implantation; suspensory ligament; capsular bag

在白内障手术中, 作为辅助性植入器械, 囊袋张力环(capsular tension ring, CTR)发挥着极为重要的作用, 其主要应用于晶状体悬韧带断裂的患者的治疗<sup>[1]</sup>。与普通白内障相比, 高度近视合并白内障患者具有较高的术后前囊收缩、后发性白内障发生率, 发生这一现象的原因为其具有较长的眼轴、较差的悬韧带弹性、较为松弛的晶状体囊袋<sup>[2]</sup>。此外, 玻璃体切除术后患者也易发生晶状体悬韧带断裂<sup>[3]</sup>。因此, 本研究比较玻璃体切除术后高度近视合并白内障患者行白内障摘除联合人工晶体植入术联合CTR植入与未联合CTR植入的效果, 现报道如下。

## 1 对象与方法

### 1.1 对象

选取2016年6月至2018年3月在河南省省立医院收治的玻璃体切除术后高度近视合并白内障患者80例(80眼), 依据白内障摘除联合人工晶

体植入术是否联合CTR植入将这些患者分为植入CTR组(植入组)和未植入CTR组(未植入组), 每组各40例。其中植入组男22例, 女18例, 年龄41~68( $54.6\pm 9.4$ )岁; 眼轴长度26~32( $29.3\pm 4.6$ ) mm; 在核硬度分级方面, 11例为II级, 20例为III级, 9例为IV级。未植入组男21例, 女19例, 年龄42~68( $55.2\pm 9.6$ )岁; 眼轴长度26~33( $29.6\pm 4.8$ ) mm; 在核硬度分级方面, 10例为II级, 22例为III级, 8例为IV级。两组患者的一般资料比较差异无统计学意义( $P>0.05$ ), 具有可比性。本研究经河南省省立医院医学伦理委员会批准, 患者或家属均签署知情同意书。

纳入标准: PPV术后需行白内障摘除手术者; 眼轴 $>30$  mm, 并发白内障需行白内障摘除手术者; 患眼悬韧带松弛或断裂但断裂小于1/4象限。排除标准: 检查发现悬韧带断裂大于1/4象限者; 由于其他原因导致的悬韧带断裂者; 计划3月内行其他眼内手术者; 正参加其他可能影响眼部情况的临床研究者。

## 1.2 方法

未植入组患者接受白内障摘除联合人工晶体植入术治疗, 植入组患者接受白内障摘除联合人工晶体植入术联合CTR植入治疗, 具体操作为: 用爱尔卡因对术眼进行表面麻醉, 在角膜最大屈光度轴位将透明角膜切口制作出来, 长度为2.8 mm, 将粘弹剂注入前房, 连续环形撕囊, 直径5.0~5.5 mm, 充分分离, 采用意大利OPTIKON公司生产的Pulsar超声乳化仪将晶状体核及皮质乳化吸出, 低负压模式下抛光前后囊膜, 尽可能减少残余晶状体上皮细胞。经角膜切口将荷兰Ophtec公司生产的CTR植入, 长度为13 mm, 然后将美国Suncoast公司生产的亲水性丙烯酸酯人工晶状体植入。术后让患者用妥布霉素地塞米松滴眼液滴眼, 4次/d。

## 1.3 观察指标

1)前囊开口直径: 测量时间点为白内障术后1周、1个月、3个月, 测量方法为眼前节光学相干断层扫描。2)视力: 测量时间点为白内障术后1周、1个月、3个月, 测量方法为“E”视力表。3)眼压: 测量时间点为白内障术后1周、1个月、3个月, 测量方法为非接触式眼压计。4)术后并发症发生情况: 前囊收缩、后囊膜混浊、人工晶体倾斜偏位。

## 1.4 统计学处理

采用SPSS 21.0统计软件进行数据分析, 计数

资料用率表示, 用 $\chi^2$ 检验; 两组患者术后1周、1个月、3个月的前囊开口直径、视力、眼压等计量资料用均数 $\pm$ 标准差( $\bar{x}\pm s$ )表示, 采用 $t$ 检验, 检验水准 $\alpha=0.05$ 。 $P<0.05$ 为差异有统计学意义。

## 2 结果

### 2.1 前囊开口直径

两组患者术后1周、1个月、3个月的前囊开口直径均逐渐增大( $P<0.05$ ), 术后1周、1个月、3个月植入组患者的前囊开口直径均显著大于未植入组( $P<0.05$ , 表1)。

### 2.2 视力

两组患者术后1周、1个月、3个月的视力均逐渐提升( $P<0.05$ ), 术后1周、1个月、3个月植入组患者的视力均显著高于未植入组( $P<0.05$ , 表2)。

### 2.3 眼压

两组患者术后1周、1个月、3个月的眼压均逐渐降低( $P<0.05$ ); 术后1周、1个月、3个月植入组患者的眼压均显著低于未植入组( $P<0.05$ , 表3)。

### 2.4 并发症

植入组患者的术后并发症发生率显著低于未植入组( $P<0.05$ , 表4)。

表1 两组术后1周、1个月、3个月的前囊开口直径变化情况比较( $n=40$ )

Table 1 Comparison of the diameter of the anterior capsule opening between two groups at 1 week, 1 month and 3 months after operation ( $n=40$ )

| 组别   | 前囊开口直径/mm       |                 |                 |
|------|-----------------|-----------------|-----------------|
|      | 1周              | 1个月             | 3个月             |
| 植入组  | 5.06 $\pm$ 0.17 | 5.11 $\pm$ 0.10 | 5.36 $\pm$ 0.16 |
| 未植入组 | 4.07 $\pm$ 0.32 | 4.40 $\pm$ 0.12 | 4.80 $\pm$ 0.18 |
| $t$  | 6.965           | 4.541           | 3.365           |
| $P$  | 0.032           | 0.036           | 0.040           |

表2 两组术后1周、1个月、3个月的视力变化情况比较( $n=40$ )Table 2 Comparison of visual acuity between two groups at 1 week, 1 month and 3 months after operation ( $n=40$ )

| 组别       | 视力          |             |             |
|----------|-------------|-------------|-------------|
|          | 1周          | 1个月         | 3个月         |
| 植入组      | 0.38 ± 0.14 | 0.66 ± 0.10 | 0.90 ± 0.13 |
| 未植入组     | 0.11 ± 0.13 | 0.44 ± 0.14 | 0.61 ± 0.15 |
| <i>t</i> | 4.303       | 3.182       | 2.776       |
| <i>P</i> | 0.026       | 0.028       | 0.018       |

表3 两组术后1周、1个月、3个月的眼压变化情况比较( $n=40$ )Table 3 Comparison of intraocular pressure changes between two groups at 1 week, 1 month and 3 months after operation ( $n=40$ )

| 组别       | 眼压/mmHg    |            |            |
|----------|------------|------------|------------|
|          | 1周         | 1个月        | 3个月        |
| 植入组      | 14.1 ± 2.3 | 13.2 ± 2.4 | 12.5 ± 2.0 |
| 未植入组     | 15.0 ± 2.8 | 14.7 ± 2.5 | 13.5 ± 2.6 |
| <i>t</i> | 6.965      | 4.541      | 3.365      |
| <i>P</i> | 0.033      | 0.030      | 0.028      |

表4 两组术后并发症发生情况比较( $n=40$ )Table 4 Comparison of postoperative complications between two groups ( $n=40$ )

| 组别       | 前囊收缩/[例(%)] | 后囊膜混浊/[例(%)] | 人工晶体倾斜偏位/[例(%)] | 总计/[例(%)] |
|----------|-------------|--------------|-----------------|-----------|
| 植入组      | 0 (0.0)     | 2 (5.0)      | 0 (0.0)         | 2 (5.0)   |
| 未植入组     | 7 (17.5)    | 9 (22.5)     | 2 (5.0)         | 18 (45.0) |
| $\chi^2$ |             |              |                 | 16.01     |
| <i>P</i> |             |              |                 | 0.004     |

### 3 讨论

CTR属于一种开放式弹性环,能够使人工晶状体居中得到有效保持<sup>[4-5]</sup>。CTR在晶状体囊袋赤道部直接作用能够更好地维持囊袋的生理状态,同时将直接机械屏障作用发挥出来,对前囊膜残留的上皮细胞迁移、分化进行有效抑制,在一定程度上促进囊袋收缩、后发性白内障发生的减少<sup>[6-8]</sup>。CTR在预防晶状体悬韧带断裂中有极为重要的应用价值。

本研究进一步探讨CTR植入在玻璃体切除术后高度近视合并白内障患者进行白内障摘除联合

人工晶体植入术中的应用效果,结果发现:两组患者术后1周、1个月、3个月的前囊开口直径均逐渐增大( $P<0.05$ ),术后1周、1个月、3个月植入组患者的前囊开口直径均显著大于未植入组( $P<0.05$ )。两组患者术后1周、1个月、3个月的视力均逐渐提升( $P<0.05$ ),术后1周、1个月、3个月植入组患者的视力均显著高于未植入组( $P<0.05$ )。两组患者术后1周、1个月、3个月的眼压均逐渐降低( $P<0.05$ );术后1周、1个月、3个月植入组患者的眼压均显著低于未植入组( $P<0.05$ )。植入组患者的术后并发症发生率5.0%(2/40)显著低于未植入组45.0%(18/40)( $P<0.05$ )。提示CTR植入在玻璃体切

除术后高度近视合并白内障患者进行白内障摘除联合人工晶体植入术中也可表现较好的应用效果。

研究<sup>[9-12]</sup>表明:在高度近视合并白内障患者的治疗中,白内障手术中和未植入CTR组相比,植入CTR组患者具有显著较低的后发性白内障发生率、显著较大的前囊膜开口直径;同时,未植入CTR组患者中显著前囊膜收缩9例,其中前囊膜开口完全闭合2例,而植入CTR组患者无前囊膜收缩、开口完全闭合等现象发生,因此认为CTR能够极大地抑制前囊膜收缩、后发性白内障发生。植入CTR能够在一定程度上将良好的前提条件提供给前囊膜收缩、后发性白内障发生的减少,但是仍然需要相关学者进一步观察其长期疗效<sup>[13-15]</sup>。此外,玻璃体切除术后患者如需进一步行白内障摘除联合人工晶体植入术,则明显增加了手术风险,尤其是晶状体悬韧带断裂。术中联合CTR植入是重要的预防途径。

综上所述,玻璃体切除术后高度近视合并白内障患者行白内障摘除联合人工晶体植入术联合CTR植入较未联合CTR植入效果好,更能有效增大患者的前囊膜开口直径,提升患者视力,降低患者眼压及术后并发症发生率,值得推广。本研究仍存在一些不足之处:仅对随访3个月内的患者资料进行了临床对比,不能说明CTR植入是否同样产生积极的远期效果,因此仍需要进一步研究。

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