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# 超声乳化手术治疗慢性闭角型青光眼合并白内障的临床疗效分析\*

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**摘要 目的:**探讨超声乳化手术治疗慢性闭角型青光眼合并白内障的临床效果。**方法:**慢性闭角型青光眼合并白内障 64 例(64 眼)根据治疗方法的不同分为治疗组与对照组各 32 例,对照组采用传统小梁切除手术,治疗组采用超声乳化手术。**结果:**(1)两组术前视力对比无明显差异,治疗后视力情况都明显改善,同时组间对比有明显差异( $P<0.05$ )。(2)两组术前眼压比较无显著性差异,术后两组组间与组内对比都有明显差异( $P<0.05$ )。(3)两组术前前房深度比较无显著性差异,治疗后都有明显上升( $P<0.05$ ),同时组间对比差异明显( $P<0.05$ )。(4)两组患者术中与术后都无严重并发症发生。**结论:**对于慢性闭角型青光眼合并白内障患者行超声乳化手术具备加深前房、控制眼压、提高视力的作用,同时安全性好,可作为标准治疗选择。

**关键词:**超声乳化手术;慢性闭角型青光眼;白内障;小梁切除术;眼压

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## The Clinical Analysis of Phacoemulsification Surgery for Chronic Angle-Closure Glaucoma with Cataract\*

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**ABSTRACT Objective:** To investigate the clinical effects of phacoemulsification surgery for chronic angle-closure glaucoma with cataract. **Methods:** 64 cases (64 eyes) with chronic angle-closure glaucoma with cataract accorded to the treatment methods were equally divided into treatment group and control group, the control group were used conventional trabeculectomy, the treatment group were used phacoemulsification. **Results:** The preoperative visual acuity compared had no significant difference and were significantly improved after treatment, while had significant differences between the groups compared( $P<0.05$ ), so that were to the IOP and anterior chamber depth ( $P<0.05$ ). Two groups of patients had no intraoperative and postoperative complications. **Conclusion:** Phacoemulsification surgery for chronic angle-closure glaucoma with cataract has the values of deepening the anterior chamber, controlling intraocular pressure and improving the vision, while the security is good, it can be used as standard treatment options.

**Key words:** Phacoemulsification; Chronic angle-closure glaucoma; Cataract; Trabeculectomy; IOP

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### 前言

青光眼是致盲性眼病中占第二位的疾病,主要类型有继发性青光眼、原发性青光眼和先天性青光眼,其分类方法也可以根据房角是否关闭又分为开角型青光眼和闭角型青光眼<sup>[1]</sup>。闭角型青光眼又分为急性闭角型青光眼和慢性闭角型青光眼两种,后者比较常见<sup>[2]</sup>。临床主要表现为视力下降、眼睛胀痛、头痛等,如果不进行及时治疗,可导致不可逆的视神经损害,形成慢性闭角型青光眼合并白内障<sup>[3]</sup>。在治疗方法中,随着超声乳化白内障吸出手术的日益普及,其已经得到了广泛应用,其具备术后眼压稳定、视力恢复快、并发症减少等特点,使超声乳化白内障吸出术作为慢性闭角型青光眼合并白内障的治疗方法已成为可能<sup>[4-5]</sup>。本文为此具体探讨了超声乳化手术治疗慢性闭角型青光眼合并白内障的临床效果。现报告如下。

### 1 资料与方法

#### 1.1 研究对象

选择 2009 年 6 月至 2013 年 3 月期间我科收治的慢性闭角型青光眼合并白内障 64 例(64 眼),入选标准:由房角镜检查确认为慢性闭角型青光眼合并白内障;晶状体均有不同程度的混浊;裂隙灯检查均有浅前房、房角狭窄、虹膜周边膨隆情况;药物治疗可局部控制;单眼发病;均无抗青光眼手术史及其他内眼手术史;无严重并发症与精神疾病;患者知情同意。其中男性患者 30 例,女性患者 34 例;年龄最小 40 岁,最大 83 岁,平均年龄为  $(69.53 \pm 6.51)$  岁。术前最佳矫正视力检查:  $\geq 0.8$  0 例,  $0.3-0.8$  4 例,  $0.1-0.3$  19 例,  $\leq 0.1$  41 例。晶状体核硬度 LOCS II 分级: II 级核 22 眼、III 级核 42 眼;平均眼压为  $(27.63 \pm 12.12)$  mmHg。根据治疗方法的不同分为治疗组与对照组各 32

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例,两组的一般资料对比无显著性差异( $P>0.05$ )。

## 1.2 手术方法

对照组:采用传统小梁切除手术进行治疗:术前2天停用缩瞳剂,手术前进行球周麻醉,以角膜缘为基底做结膜瓣,以上方角膜缘为基底,做1/2巩膜厚度、4 mm×4 mm面积的巩膜瓣,依据患者情况合理应用丝裂霉素C(0.33 mg/ml)贴敷,时间约为2分钟,应用100 mL平衡盐液冲洗,切除1.5 mm×3 mm面积的小梁及角巩膜组织,然后10/0尼龙线缝合巩膜瓣,于巩膜瓣两侧经上方角膜缘行应用可吸收缝线连续缝合球结膜。

治疗组:采用超声乳化手术:术前2天停用缩瞳剂,手术前首先在患者结膜囊的表面进行麻醉后,用浓度为0.9%生理盐水进行冲洗,铺放消毒铺巾后再角膜颞侧的右侧部位行隧道式透明角膜切口(切口宽度以2.5厘米左右为宜),为了增大前房的深度,需要为患者注入适量的粘弹剂,而后行5厘米左右的环形撕囊(为了达到防止晶状体在囊袋内部转动的目的,撕囊下需要保持有充分的水分)。采用infiniti型超声乳化仪器,应用功率设置为40%,负压吸引数值设置为150 mmHg,应用拦截劈裂的方法对晶状体核进行分块的超声乳化吸出操作,以

彻底清除残留的晶状体皮质组织,与此同时,在囊袋内放置折叠式人工晶体,放置完成后彻底吸出粘弹剂。术毕结膜囊内涂复方妥布霉素眼药膏,包扎单眼。

## 1.3 观察指标

所有患者在手术前1天与手术后1个月给予视力检查、Goldman眼压检查、前房深度、裂隙灯等各种检查,观察术后并发症,所有检查均有副主任医师完成。

## 1.4 统计方法

统计资料经过平均值(以平均值加减标准差表示:)计算后,数据录入SPSS17.0统计学软件包中进行分析,计量资料组间比较选用t检验方法,以 $\alpha=0.05$ 为检验标准比较组间差异性。

# 2 结果

## 2.1 视力对比

经过观察,两组术前视力对比无明显差异,治疗后视力情况都明显改善,同时组间对比有明显差异( $P<0.05$ )。见表1。

表1 两组手术治疗前后视力的变化(n)

Table 1 Comparison of changes in visual acuity before and after surgery (n)

| Groups          | n  | Before surgery |         |         |            | After surgery |         |         |            |
|-----------------|----|----------------|---------|---------|------------|---------------|---------|---------|------------|
|                 |    | $\geq 0.8$     | 0.3-0.8 | 0.1-0.3 | $\leq 0.1$ | $\geq 0.8$    | 0.3-0.8 | 0.1-0.3 | $\leq 0.1$ |
| Treatment group | 32 | 0              | 2       | 10      | 20         | 10            | 20      | 2       | 0          |
| Control group   | 32 | 0              | 2       | 9       | 21         | 6             | 10      | 10      | 6          |
| Uc              |    | 0.236          |         |         |            | 4.593         |         |         |            |
| P               |    | >0.05          |         |         |            | <0.05         |         |         |            |

## 2.2 眼压对比

两组术前眼压比较无显著性差异,术后两组组间与组内对比都有明显差异( $P<0.05$ )。见表2。

## 2.3 前房深度对比

两组术前后房深度比较无显著性差异,治疗后都有明显上升( $P<0.05$ ),同时组间对比差异明显( $P<0.05$ )。见表3。

表2 两组治疗前后眼压的变化(mmHg,  $\bar{x} \pm s$ )

Table 2 Pressure changes of patients in two groups before and after the treatment (mmHg,  $\bar{x} \pm s$ )

| Groups          | n  | Before surgery | After surgery |
|-----------------|----|----------------|---------------|
| Treatment group | 32 | 27.56± 3.36    | 11.26± 3.25   |
| Control group   | 32 | 27.78± 4.16    | 16.98± 4.11   |
| t               |    | 0.159          | 4.698         |
| P               |    | >0.05          | <0.05         |

表3 两组治疗前后前房深度对比(mm,  $\bar{x} \pm s$ )

Table 3 The real depth of patients in two groups before and after the treatment (mm,  $\bar{x} \pm s$ )

| Groups          | n  | Before surgery | After surgery |
|-----------------|----|----------------|---------------|
| Treatment group | 32 | 2.26± 0.41     | 4.06± 0.32    |
| Control group   | 32 | 2.24± 0.45     | 3.71± 0.56    |
| t               |    | 0.156          | 4.512         |
| P               |    | >0.05          | <0.05         |

## 2.4 并发症对比

两组患者术中均未发生后囊破裂、玻璃体脱出等并发症,术后也没有出现视网膜脱离、人工晶体夹持与黄斑囊样水肿等并发症。

## 3 讨论

白内障和青光眼都是常见眼病,如果两种眼病伴随发生,彼此将产生叠加效应,加重眼病<sup>[6]</sup>。其中慢性闭角型青光眼合并白内障会导致视神经的不可逆损害,也多发生于老年人,常伴有周边虹膜前粘连、房角狭窄、甚至关闭等,给患者造成严重的后果<sup>[7-9]</sup>。从机制上分析,随着年龄的增大,人体的晶体会逐渐增厚、并且发生位置的前移,使虹膜进一步贴向小梁网,晶状体与虹膜的接触面增大,因此解除了晶体的制约因素,就能有效缓解青光眼<sup>[10-12]</sup>。

传统的慢性闭角型青光眼合并白内障手术治疗原则是根据房角粘连程度选择小梁切除手术或周边虹膜切除术,但术后往往加速白内障的形成,导致治疗效果不佳<sup>[13,14]</sup>。且由于手术难度增高,操作复杂,增加了手术风险。随着显微手术技术、材料和设备的日臻完善,超声乳化手术治疗青光眼合并白内障的安全性与其有效性均大为提高<sup>[15-17]</sup>。

超声乳化手术可用于矫正大范围的近视、远视和散光,无须进行手术后缝合。同时超声乳化切口小,术后前房形成好、术后视力恢复快、术中虹膜脱出可能性小,可以减少对虹膜刺激,而且保留了完整的球结膜<sup>[13,14]</sup>。本文两组术前视力对比无明显差异,治疗后视力情况都明显改善,同时组间对比有明显差异( $P < 0.05$ )。两组术前眼压比较无显著性差异,术后两组组间与组内对比都有明显差异( $P < 0.05$ )。两组术前后房深度比较无显著性差异,治疗后都有明显上升( $P < 0.05$ ),同时组间对比差异明显( $P < 0.05$ )。两组患者术中均未发生后囊破裂、玻璃体脱出等并发症,术后也没有出现视网膜脱离、人工晶体夹持与黄斑囊样水肿等并发症。说明与证实了超声乳化手术能取得更好的效果。

不过在超声乳化手术的应用要注重以下事项:应充分解除瞳孔粘连,尽可能完成环形撕囊,促进皮质粘连完全分层<sup>[18,19]</sup>。术中对硬核的处理,宜采用劈核、碎核技术,减少角膜内皮损伤。术前采用药物降低眼压并尽量控制在正常范围后行手术治疗,术前应停用缩瞳剂。术毕充分吸除干净残存粘弹剂,防止术后眼压升高对视神经的进一步损害<sup>[20]</sup>。

总之,对于慢性闭角型青光眼合并白内障患者行超声乳化手术具备加深前房、控制眼压、提高视力的作用,同时安全性好,可作为标准治疗选择。

### 参考文献(References)

- [1] 张磊,王强,雷宁玉,等.超声乳化白内障吸除术联合人工晶状体植入术治疗闭角型青光眼的临床观察[J].国际眼科杂志,2008,8(4):742-744  
Zhang Lei, Wang Qiang, Lei Ning-yu, et al. Effect of phacoemulsification with foldable posterior chamber intraocular lens implantation in management of acute angle-closure glaucoma [J]. International Journal of Ophthalmology, 2008, 8(4): 742-744
- [2] Chen YH, Lu DW, Cheng JH. Trabeculectomy in patients with primary angle-closure glaucoma[J]. Ophthalmology, 2003, 11(10): 1799-1806
- [3] Huang P, Shi Y, Wang X, et al. Use of microperimetry to compare macular light sensitivity in eyes with open-angle and angle-closure glaucoma[J]. Jpn J Ophthalmol, 2012, 56(2): 138-144
- [4] Liu X, Li M, Zhong Y, et al. The damage patterns of retinal nerve fiber layer in acute and chronic intraocular pressure elevation in primary angle closure glaucoma[J]. Eye Sci, 2011, 26(3): 154-160
- [5] Li A, Zhang X, Zheng D, et al. Sustained elevation of extracellular ATP in aqueous humor from humans with primary chronic angle-closure glaucoma[J]. Exp Eye Res, 2011, 93(4): 528-533
- [6] Schwenn O. Acute angle closure, chronic angle-closure glaucoma and their differential diagnoses [J]. Klin Monbl Augenheilkd, 2011, 228(7): R95-104
- [7] Bodh SA, Kumar V, Raina UK, et al. Inflammatory glaucoma[J]. Oman J Ophthalmol, 2011, 4(1): 3-9
- [8] Jiang H, Zhong LD, Zhang J. Comparison of the Effects of Two Surgeries for Angle-Closure Glaucoma with Cataract [J]. Ophthalmology, 2009, 18(2): 331-334
- [9] Fang AW, Yang Xj, Nie L, et al. Endoscopically controlled goniosynechialysis in managing synechial angle-closure glaucoma [J]. Journal of glaucoma, 2010, 19(2): 19-23
- [10] Kiuchi Y, Tsujino C, Nakamura T, et al. Phacoemulsification and trabeculectomy combined with goniosynechialysis for uncontrollable chronic angle-closure glaucoma[J]. Ophthalmic Surg Lasers Imaging, 2010, 41(2): 348-354
- [11] Kulachanpises C, Yuttitham K, Wanichwecharungruang B. Ultrasound biomicroscopy measured anterior and posterior chamber diameters--a novel way to evaluate angle-closure glaucoma [J]. J Med Assoc Thai, 2011, 94(5): 579-584
- [12] 李世宏,叶剑,尹小磊.超声乳化人工晶体植入在白内障膨胀期原发性房角关闭治疗的长期观察[J].第三军医大学学报,2010,31(2):2013-2015  
Li Shi-hong, Ye Jian, Yin Xiao-lei. Phacoemulsification and intraocular lens implantation for acute primary angle closure with cataract in expansion phase: a long-term efficiency study [J]. Acta Academiae Medicinae Militaris Tertiae, 2010, 31(2): 2013-2015
- [13] 张春元,唐志刚,奚婷,等.超声乳化白内障吸出联合房角分离术治疗原发性闭角型青光眼并发白内障的疗效观察[J].现代生物医学进展,2012,12(35):6901-6904  
Zhang Chun-yuan, Tang Zhi-gang, Xi Ting, et al. Observation on the Clinical Effect of Phacoemulsification Combined with Goniosynechialysis in the Treatment of Primary Angle Closure Glaucoma with Cataract[J]. Progress in Modern Biomedicine, 2012, 12(35): 6901-6904
- [14] Dada T, Mohan S, Bali SJ, et al. Ultrasound biomicroscopic assessment of angle parameters in patients with primary angle closure glaucoma undergoing phacoemulsification[J]. Eur J Ophthalmol, 2011, 21(5): 559-565
- [15] Nongpiur ME, Ku JY, Aung T. Angle closure glaucoma: a mechanistic review[J]. Curr Opin Ophthalmol, 2011, 22(2): 96-101
- [16] Kong X, Liu X, Huang X, et al. Damage to the blood-aqueous barrier in eyes with primary angle closure glaucoma [J]. Mol Vis, 2010, 8(16): 2026-2032

- 2005, 2(2): 399-409
- [16] Pak M, Lopez MA, Gabayan V, et al. Suppression of hepcidin during anemia requires erythropoietic activity [J]. *Blood*, 2006, 108 (11): 3730-3735
- [17] Tanno T, Porayette P, Sripichai O, et al. Identification of TWSG1 as a second novel erythroid regulator of hepcidin expression in murine and human cells[J]. *Blood*, 2009, 114(1): 181-186
- [18] Tanno T, Noel P, Miller JL. Growth differentiation factor 15 in erythroid health and disease [J]. *Curr Opin Hematol*, 2010, 17 (2): 184-190
- [19] Lin L, Goldberg YP, Ganz T. Competitive regulation of hepcidin mRNA by soluble and cell-associated hemojuvelin [J]. *Blood*, 2005, 106(25): 2884-2889
- [20] Du X, She E, Gelbart T, et al. The serine protease TMPRSS6 is required to sense iron deficiency[J]. *Science*, 2008, 320(10): 1088-1092
- [21] Finberg KE, Heeney MM, Campagna DR, et al. Mutations in TMPRSS6 cause iron-refractory iron deficiency anemia (IRIDA)[J]. *Nat Genet*, 2008, 40(2): 569-571
- [22] Delaby C, Pilard N, Hetet G, et al. A physiological model to study iron recycling in macrophages[J]. *Exp Cell Res*, 2005, 310(1): 43-53
- [23] Knutson MD, Vafa MR, Haile DJ, et al. Iron loading and erythrophagocytosis increase ferroportin 1 (FPN1) expression in J774 macrophages[J]. *Blood*, 2003, 102(55): 4191-4197
- [24] Yang F, Liu XB, Quinones M, et al. Regulation of reticuloendothelial iron transporter MTP1 (Slc11a3) by inflammation [J]. *J Biol Chem*, 2002, 277(26): 39786-39791
- [25] Theurl I, Aigner E, Theurl M, et al. Regulation of iron homeostasis in anemia of chronic disease and iron deficiency anemia: diagnostic and therapeutic implications[J]. *Blood*, 2009, 113(26): 5277-5286
- [26] Ripley BJ, Goncalves B, Isenberg DA, et al. Raised levels of interleukin 6 in systemic lupus erythematosus correlate with anaemia[J]. *Ann Rheum Dis*, 2005, 64(3): 849-853
- [27] Nikolaisen C, Figenschau Y, Nossent JC. Anemia in early rheumatoid arthritis is associated with interleukin 6-mediated bone marrow suppression, but has no effect on disease course or mortality [J]. *J Rheumatol*, 2008, 35(2): 380-386
- [28] Zhang DL, Hughes RM, Ollivierre-Wilson H, et al. A ferroportin transcript that lacks an ironresponsive element enables duodenal and erythroid precursor cells to evade translational repression [J]. *Cell Metab*, 2009, 9(5): 461-473
- [29] Keel SB, Abkowitz JL. The microcytic red cell and the anemia of inflammation[J]. *N Engl J Med*, 2009, 361(19): 1904-1906
- [30] Dallaglio G, Law E, Means RT Jr. Hepcidin inhibits in vitro erythroid colony formation at reduced erythropoietin concentrations [J]. *Blood*, 2006, 107(7): 2702-2704
- [31] Moldawer LL, Marano MA, Wei H, et al. Cachectin/tumor necrosis factor-alpha alters red blood cell kinetics and induces anemia in vivo [J]. *FASEB J*, 1989, 3(11): 1637-1643
- [32] Manodori AB, Kuypers FA. Altered red cell turnover in diabetic mice [J]. *J Lab Clin Med*, 2002, 140(3): 161-165
- [33] Mityling BL, Singh JA, Furne JK, et al. Use of breath carbon monoxide measurements to assess erythrocyte survival in subjects with chronic diseases[J]. *Am J Hematol*, 2006, 81(6): 432-438
- [34] Brugnara C. Iron deficiency and erythropoiesis: new diagnostic approaches[J]. *Clin Chem*, 2003, 49(10): 1573-1578
- [35] Allen LA, Felker GM, Mehra MR, et al. Validation and potential mechanisms of red cell distribution width as a prognostic marker in heart failure[J]. *J Card Fail*, 2010, 16(3): 230-238
- [36] Ferring-Appel D, Hentze MW, Galy B. Cell-autonomous and systemic context-dependent functions of iron regulatory protein 2 in mammalian iron metabolism[J]. *Blood*, 2009, 113(3): 679-687
- [37] Skikne BS. Serum transferrin receptor [J]. *Am J Hematol*, 2008, 83 (11): 872-875
- [38] Kroot JJ, Kemna EH, Bansal SS, et al. Results of the first international round robin for the quantification of urinary and plasma hepcidin assays: need for standardization [J]. *Haematologica*, 2009, 94 (12): 1748-1752
- [39] Ganz T, Olbina G, Girelli D, et al. Immunoassay for human serum hepcidin[J]. *Blood*, 2008, 112(10): 4292-4297
- [40] Coyne DW, Kapoian T, Suki W, et al. Ferric gluconate is highly efficacious in anemic hemodialysis patients with high serum ferritin and low transferrin saturation: results of the Dialysis Patients' Response to IV Iron with Elevated Ferritin (DRIVE) Study[J]. *J Am Soc Nephrol*, 2007, 18(3): 975-984

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- [17] 殷秀丽, 陈卓, 付安安, 等. 1300 眼超声乳化吸除白内障及人工晶体植入术的围手术期护理 [J]. *现代生物医学进展*, 2012, 12(34): 6723-6725, 6733
- Yin Xiu-li, Chen Zhuo, Fu An-an, et al. 1300 Phacoemulsification Cataract and Intraocular Lens Implantation in Perioperative Nursing [J]. *Progress in Modern Biomedicine*, 2012, 12(34): 6723-6725, 6733
- [18] Sowka J, Girgis N. Bilateral phacomorphic angle-closure glaucoma in a highly myopic patient secondary to isolated spherophakia[J]. *Optometry*, 2010, 81(9): 432-436
- [19] Neuburger M, Bhringer D, Reinhard T, et al. Recovery of corneal hysteresis after reduction of intraocular pressure in chronic primary angle-closure glaucoma[J]. *Am J Ophthalmol*, 2010, 149(4): 687-688
- [20] Razeghinejad MR, Rahat F. Combined phacoemulsification and viscosynechialysis in the management of patients with chronic angle closure glaucoma[J]. *Int Ophthalmol*, 2010, 30(4): 353-359