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Clear Lens Extraction for Early Angle-Closure Glaucoma: Revolution or Overtreatment?

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Dear Editor,

Glaucoma is the first cause of irreversible blindness in the world. It is predicted that in 2040, 34 million people worldwide will be suffering from glaucoma, and 5.3 million of them will be blind [1]. Primary angle-closure glaucoma is the main type of glaucoma in Asia, especially in East Asia [2]. Its etiology is not clear. The abnormal anatomy of the anterior segment (shallow anterior chamber, narrow angle) is the anatomical basis of pathogenesis. The presence of pupillary block, non-pupillary block, or the combined pathogenesis causes the peripheral iris to experience sudden or slow progressive occlusion of the trabecular meshwork, thereby blocking aqueous humor discharge and causing intraocular pressure to increase rapidly or progressively [3]. If the course of disease is not effectively controlled, then it will eventually cause optic nerve damage and even blindness [4].

The treatment of angle-closure glaucoma varies according to the course of the disease. The general treatment is surgery after drug control. For patients with goniosynechia more than 180° or significant optic atrophy, trabeculectomy combined with antimebolites is the treatment option [5]. Patients with advanced blindness are treated with ciliary body photocoagulation [5]. Patients with goniosynechia less than 180° are treated with laser peripheral iridectomy [5]. Cataract extraction combined with angle separation has also been used in the treatment of angle-closure glaucoma [6]. Its advantage is the ability to effectively separate surrounding anterior adhesion. Cataract extraction can further widen and open the angle, deepen the anterior chamber and reduce intraocular pressure. However, this treatment is not the same for different stages of glaucoma patients.

Azuara-Blanco et al. [7] recently published a research paper in which clear lens extraction and laser peripheral iridectomy were conducted on 419 patients with early angle-closure glaucoma. A

comparative analysis of vision, intraocular pressure, complications and other phenomena after surgery showed that clear lens extraction was better than laser peripheral iridectomy in the control of intraocular pressure and does not require reoperation [7]. Therefore, clear lens extraction is more effective for the treatment of early glaucoma and is recommended as the first-line treatment. This recommendation is contrary to the 2014 European Glaucoma Guidelines [8], which indicate the following: (a) laser peripheral iridectomy can deepen the angle for patients with angle-closure combined with plateau-iris glaucoma; (b) laser peripheral iridectomy can be used as the first choice for patients with acute angle closure glaucoma combined with pupillary block factors; and (c) peripheral iridectomy can be used as the initial treatment for all patients with chronic angle closure glaucoma. The advantages of peripheral iridectomy, especially laser peripheral iridectomy, are a high level of safety and fewer complications. The research by Azuara-Blanco et al. [7] indicated that the complications from clear cataract extraction were almost greater than those from laser peripheral iridectomy. Generally, the incidence of such complications is low. However, prolapse of vitreous, macular edema, post-operative inflammation, and other complications could lead to decreased vision and psychological burden to the patients with clear lens [9]. Furthermore, the lens is known to have an important physiological role, that is, it has the accommodation function [10] in which, for objects at different distances, the lens can change its curvature to change the diopter of the eyes and enable one to see the objects clearly [11]. Artificial lenses do not have such function. When a cataract occurs, the lens will gradually lose its accommodation function. For patients with transparent lens, the application of artificial lens is tantamount to eliminating its accommodation function.

In sum, clear lens extraction can effectively control the intraocular pressure in the long term, equivalent to opening the angle of patients with angle-closure glaucoma in the form of advanced treatment of cataract and deepening the anterior chamber. However, physicians also need to view issues from the perspective of patients and consider problems in a more humane term. For patients with early angle-closure glaucoma, laser peripheral iridectomy not only maintains the lens regulatory function but also has high operational safety, with fewer complications. Thus, early angle-closure glaucoma should continue to be treated in accordance with the provisions of the Glaucoma Guidelines.

References

- 1 Tham YC, Li X, Wong TY, et al: Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. *Ophthalmology* 2014;121:2081–2090.
- 2 Chan EW, Li X, Tham YC, et al: Glaucoma in Asia: regional prevalence variations and future projections. *Br J Ophthalmol* 2016;100:78–85.
- 3 Lai J, Choy BN, Shum JW: Management of primary angle-closure glaucoma. *Asia Pac J Ophthalmol (Phila)* 2016;5:59–62.
- 4 Wright C, Tawfik MA, Waisbourd M, et al: Primary angle-closure glaucoma: an update. *Acta Ophthalmol* 2016;94:217–225.
- 5 Anwar F, Turalba A: An overview of treatment methods for primary angle closure. *Semin Ophthalmol* 2017;32:82–85.
- 6 Tarongoy P, Ho CL, Walton DS: Angle-closure glaucoma: the role of the lens in the pathogenesis, prevention, and treatment. *Surv Ophthalmol* 2009;54:211–225.
- 7 Azuara-Blanco A, Burr J, Ramsay C, et al: Effectiveness of early lens extraction for the treatment of primary angle-closure glaucoma (EAGLE): a randomised controlled trial. *Lancet* 2016;388:1389–1397.
- 8 European Glaucoma Society: Terminology and Guidelines for Glaucoma, ed 4. Savona, Publicomm, 2014, pp 131–171.
- 9 Weinreb RN, Aung T, Medeiros FA: The pathophysiology and treatment of glaucoma: a review. *JAMA* 2014;311:1901–1911.
- 10 Hejtmancik JF, Riazuddin SA, McGreal R, et al: Lens biology and biochemistry. *Prog Mol Biol Transl Sci* 2015;134:169–201.
- 11 Snell RS, Lemp MA: *Clinical Anatomy of the Eye*, ed 2. Malden, Blackwell Publishing, 1998, pp 197–207.