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PHACOMORPHIC GLAUCOMA WITH SENILE IMMATURE CATARACT: A CASE REPORT

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ABSTRACT

Phacomorphic glaucoma is a secondary angle-closure glaucoma caused by lens thickening due to cataract formation process, potentially leading to increased intraocular pressure and a risk of permanent optic nerve damage, resulting in visual impairment. This report discusses a case involving a 57-year-old female presenting with blurred vision and pain in one eye, diagnosed with phacomorphic glaucoma with senile immature cataract based on history taking, and ophthalmological examination. The findings revealed decreased visual acuity, lens opacity in the left eye with a positive shadow test, increased iop, and shallow anterior chamber. the patient initially received medical therapy to lower intraocular pressure, followed by definitive treatment, which consisted of a combination of phacoemulsification with intraocular lens implantation and trabeculectomy. postoperative results showed symptom and visual acuity improvement, although the prognosis for visual function depends on the degree of optic nerve damage prior to treatment. primary management of phacomorphic glaucoma involves cataract extraction, which causes pupil block, that is often combined with trabeculectomy to effectively control intraocular pressure.
Keywords: glaucoma, phacomorphic, cataract, phacoemulsification, trabeculectomy

INTRODUCTION

Cataracts and glaucoma are the leading causes of visual impairment in Asia. In Mongolia, cataract and glaucoma contribute to 36% and 35% of blindness respectively. As both are diseases of old age, they can coexist and under certain circumstances, one disease can even cause the other (Kamar & Gupta, 2023). Glaucoma is a group of disorders that share the common characteristic of progressive degeneration of the optic nerve, with loss of retinal ganglion cells, thinning of the retinal nerve fiber layer, and increased optic disc damage (Schuster et al., 2020). Elevated intraocular pressure (intraocular pressure) is a risk factor for this disease (Ariesti, 2018). The risk of glaucoma can be diagnosed from several factors such as race, gender, degree and refractive error, elevated intraocular pressure, genetics, and family history of the disease (McMonnies, 2017). Glaucoma based on its cause is classified into two, namely, primary and secondary. Based on their anatomy and pathophysiology, both have open and closed angle types (Allison et al., 2020). Meanwhile, cataract is an eye disease characterized by clouding of the lens of the eye, which interferes with the entry of light into the eye. Cataracts can be caused by disruption of the water and electrolyte balance control mechanism, due to denaturation of lens proteins or a combination of both. About 90% of cataract cases are age-related; other causes are congenital and trauma (Astari, 2018).

Phacomorphic glaucoma is a secondary angle-closure glaucoma caused by thickening of the lens which can occur due to cataract formation (Ciputra, 2022). In a study, some of the most common causes of all secondary glaucoma cases were found to be lens induced glaucoma 2.5% followed by neovascular glaucoma 0.95%, uveitis glaucoma 0.4% and steroid induced glaucoma 0.2% (Soemantri et al., 2018).

Facomorphic glaucoma is a disease unique to developing countries like India (3.91% of all cataract surgeries performed), where the incidence of cataracts far exceeds the total number of surgeries.

In developing countries with uneven distribution of eye care facilities and economic constraints, many patients with age-related cataracts cannot get cataract surgery in time and present with phakomorphic glaucoma (Harpet, 2016).

METHOD

Case Study

A 57-year-old woman came to the eye clinic of RSUD Bangkinang, Riau with complaints of blurry and aggravated vision of the left eye since approximately 1 month before entering the hospital. The vision felt blurry as if it was covered with smoky fog, felt when looking far and near. The patient also claimed to often feel glare if he was in a bright place, especially from morning to evening, decreasing at night. Complaints are accompanied by pain in the left eye that radiates to the head and is felt to arise, there are also complaints of red eyes in the left eye. Previous medical history there is a history of asthma but the patient does not regularly take medication, and there is a history of migraines that are often experienced in and out of the last 1 month. The patient is a trader, does not have a habit of smoking or alcohol consumption.

On physical examination, the general condition was found to be moderately ill with GCS composmentis, blood pressure 130/78 mmHg, pulse frequency 78 times per minute, respiratory frequency 19 times per minute, temperature 36.2 degrees Celsius, oxygen saturation 98%. Nutritional status was found normal with a body weight of 56 kg and height of 155 cm. In ophthalmology status, abnormalities were found in the sinistra oculi, namely, visus 1/2/60, accompanied by conjunctival injection, there was udema on the cornea, the front eye chamber was shallow, the lens was found cloudy with a positive shadow test, and increased intraocular pressure, namely N + 2 (table 1).

Table 1. Ophthalmologic examination results

OD		OS
6/6	**Visus**	1/2/60
	Anterior Segment Examination	
Udem (-)	**Palpebra**	Udem (-)
Blepharitis (-) Secret (-)	**Secret Cilia**	Blepharitis (-) Secret (-)
Hyperemic (-), secretion (-)	**Conjunctiva/sclera**	Conjunctival injection (+), discharge (-)
Clear impression, keratopathy (-), cicatrix (-)	**Cornea**	Clear impression, edema (+), keratopathy (-), cicatrix (-)
Hyphema (-), hypopion (-), flare (-)	**BMD**	Shallow, hyphema (-), hypopion (-), flare (-)
Chocolate	**Iris**	Chocolate
Round, regular edges, light reflex (+)	**Pupil**	Round, regular edges, slow light reflex (+)
Clear, shadow test (-)	**Lenses**	Turbid, shadow test (+)
	Intraocular Pressure Check	
N		N+2

The patient was diagnosed with facomorphic glaucoma oculi sinistra (OS) + senile immature cataract oculi sinistra (OS). The patient was then given management in the form of acetazolamide tablets 250 mg 4x1, KSR tablets 600 mg 2x1, timolol 0.25% eye drops 3x1 gtt OS, polydex eye drops 5 ml 6x1 gtt OS and directed to return to control 1 week later. After 1 week, the patient used the medicines that had

been given previously, no significant results were obtained from complaints or from the results of the physical examination, where the patient's ophthalmology status was obtained, complaints of blurred left eye and pain was still felt, with left eye vision 1/2/60, cloudy lens, shallow anterior chamber, and intraocular pressure N+2. Furthermore, phacoemulsification + IOL implantation OS + trabeculectomy OS was planned.

RESULT AND DISCUSSION

Phacomorphic glaucoma is a secondary angle-closure glaucoma caused by thickening of the lens which can result from cataract formation, where a cataract is a clouding of the lens of the eye that can occur due to hydration, denaturation of lens proteins or both, which is progressive. This will cause a narrowing of the angle that occurs slowly along with the formation of cataracts, resulting in pushing the iris forward and will result in obstruction of the aquos flow between the edge of the pupil and the anterior capsule of the lens, or causing pupillary blockade (Ciputra, 2022). In the patient, there were complaints of decreased vision, where the left eye felt like it was covered with fog accompanied by a vision examination result of 1/2/60, turbidity in the lens, corneal edema, and a positive shadow test result indicating that the patient had immature senile cataract (intumescent). The clinical manifestations in the immature stage of cataracts are a decrease in vision to 5/60 to 1/60, a positive shadow test, a shallow front eye chamber, and a narrow eye chamber angle (Ilyas & Yulianti, 2017). At this stage, the degenerative lens begins to absorb ocular fluid into the lens so that the lens becomes convex.

As a result of the swollen lens, the iris is pushed forward, so that the eye chamber becomes shallow and the angle of the eye chamber will be narrow or closed, and this can later cause the onset of facomorphic glaucoma (Suhardjo, 2012). The patient was also found to have signs such as pain in the left eye that radiated to the head, often recurring, nausea, accompanied by conjunctival injection, corneal edema, and shallow front eye chambers, as well as increased intraocular pressure that only occurred in one eye (asymmetrical), thus strengthening the patient's diagnosis of facomorphic glaucoma oculi sinistra with immature cataract seinilis oculi sinistra.

The definitive management of phakomorphic glaucoma is management of the cause, which is surgery to extract the cataract. Before surgery is performed, intraocular pressure and inflammation need to be lowered with glaucoma medications and anti-inflammatory corticosteroids (PERDAMI, 2018). Glaucoma medications that can be given are oral and topical acetazolamides. In addition to acetazolamide which can work as a carbonic anhydrase inhibitor to reduce aquatic humor production, there are several other drug options, namely, beta-adrenergic inhibitor drugs (betaxolol 0.5% eye drops, timolol 0,5% eye drops) which work by inhibiting the production of cyclic adenosine monophosphate in the ciliary body so that the production of aquatic humor decreases, alpha-adrenergic agonists (apraclonidine, briminodine eye drops) which reduce the production of aquatic humor by lowering episcleral venous pressure and also improving trabecular pathway outflow. There are also drugs that work by increasing the outflow of aquatic humor, such as, prostaglandin analogues (latanaprost, travaprost) which are thought to increase the fascia distance of the ciliary body muscles thereby increasing uveoscleral and trabecular outflow, and parasympathomimetic drugs or myotics (pilocarpine) which cause contraction of the longitudinal muscles of the ciliary body and tighten the trabecular webbing thereby increasing aquatic humor ejection. If the intraocular pressure is still high, hyperosmotic agents such as glycerin and mannitol can be given intravenously (Suhardjo, 2012). After intraocular pressure control, in phakomorphic glaucoma, cataract extraction is performed, either by intra capsular cataract extraction (ICCE), extra capsular cataract extraction (ECCE), small incision cataract surgery

(SICS), or phacoemulsification. After cataract extraction, invasive treatments for glaucoma can be performed, namely, laser iridotomy, laser trabeculoplasty or surgical trabeculectomy (Sitorus et al., 2020).

In this case, the patient was given initial medical therapy, namely acetazolamide tablets 4x1, KSR tablets 2x1 to prevent hypokalemia due to acetazolamide administration, timolol 0.25% eye drops 3x1 gtt, and polydex eye drops 5x1 gtt to help lower intraocular pressure before finally definitive management of the patient, namely surgery. The patient was selected for combined surgery, namely phacoemulsification surgery + IOL implantation OS + trabeculectomy OS. Based on the literature, the definitive management of secondary glaucoma, especially those caused by cataracts, is to perform cataract extraction. In addition to cataract extraction, a combination of phacoemulsification and trabeculectomy is also often performed (Artini, 2018). Trabeculectomy is recommended if the patient's intraocular pressure is not controlled even with medical therapy (PERDAMI, 2018). A phakotrabeculectomy provides two advantages, namely, facilitating the outflow of aquatic fluid by creating a shunt from the back eye chamber to the front eye chamber and subconjunctiva, and enlarging the front eye chamber by replacing the convex crystalline lens with a much thinner intraocular lens. There have been studies that show a significant reduction in intraocular pressure within 15 years with a reduction in intraocular pressure of more than 30% (Artini, 2018).

At the postoperative control, complaints of pain were found to be reduced, and an increase in the results of the sinistra ocular visus examination where the results were obtained 6/12, with the front eye chamber deep enough, and there was an intraocular lens in the left eye. The prognosis for visual function depends on the severity of the optic nerve damage before the action is taken, then periodic follow-up is carried out on the patient postoperatively.

CONCLUSION

This case report describes a patient diagnosed with facomorphic glaucoma associated with senile immature cataract. This condition is one of the complications of untreated cataract, where the cataracted lens eventually leads to a significant increase in intraocular pressure. However, many patients do not have their cataract eyes examined until they develop complications such as phacomorphic glaucoma, especially in elderly patients in developing countries who have limited access to healthcare, economic problems, and so on. On the other hand, the prognosis of treatment outcomes in patients with phakomorphic glaucoma accompanied by cataracts is highly dependent on the state of optic nerve damage prior to treatment. These cases need to be treated with a multi-disciplinary approach, including intraocular pressure management and cataract extraction surgery. Early diagnosis, appropriate treatment and patient education are essential to prevent further damage to the eye structures and preserve visual function.

REFERENCES

Allison, K., Patel, D., & Alabi, O. (2020). Epidemiology of glaucoma: The past, present, and predictions for the future. *Cureus.* https://doi.org/10.7759/cureus.11686

Ariesti, A., & Herriadi, D. (2018). Profile of glaucoma at The Dr. M. Djamil Hospital Padang, West Sumatra. *Journal of FK Unand.* Retrieved from http://jurnal.fk.unand.ac.id

Artini, W. (2018). The effectiveness of combined cataract and glaucoma surgery one step and two steps in primary angle closure glaucoma patients. *eJournal Kedokteran Indonesia, 6*(3). https://doi.org/10.23886/ejki.6.10106

Astari, P. (2018). Cataract: Classification, management, and complications of surgery. *CDK 269, 45*(10).

Faculty of Medicine UGM.
Ciputra, F. (2022). Phacomorphic glaucoma: A literature review. *JKU, 11*(2), 887-896.
Harpet, G. (2016). Medscape: Phacomorphic glaucoma.
Ilyas, & Yulianti, S. (2017). *Eye disease science* (5th Edition). Faculty of Medicine Indonesia.
Kumar, J., & Gupta, A. (2023). Risk factors for development of phacomorphic glaucoma in mature cataract - A hospital-based study. *Jhansi International Journal of Advanced Research, 11*(April), 1395-1399.
McMonnies, C. W. (2017). Glaucoma history and risk factors. *Journal of Optometry, 10*(2), 71-78. https://doi.org/10.1016/j.optom.2016.02.003
PERDAMI. (2018). *National guidelines for glaucoma medical services.*
Schuster, A. K., Erb, C., Hoffmann, E. M., Dietlein, T., & Pfeiffer, N. (2020). The diagnosis and treatment of glaucoma. *Dtsch Arztebl Int.* https://doi.org/10.3238/arztebl.2020.0225
Sitorus, R., Sitompul, R., Widyawati, S., & Bani, A. (2020). *Textbook of ophthalmology* (First edition). University of Indonesia Publishing.
Soemantri, I., & Ilahi, F. (2018). *National guidelines for glaucoma medical services.*
Suhardjo. (2012). *Eye lens and cataract in eye health science* (2nd Edition). Faculty of Medicine UGM.