



Case Report

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# Rectifying A Misjudgment in Performing Trabeculectomy on Advanced Stage Closed Angle Glaucoma: A Case Report. Sulastiwaty R1, Pasaribu U1 JEC Eye Hospitals and Clinics, Indonesia



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### Abstract

**Background:** Given that there are many currently available options for glaucoma treatment, the best election must be taken in order to produce the best expected outcome for the patients and to minimize the risk of complications. Case Presentation: We report the case of a 54-year-old man with Primary Closed angle glaucoma with 1.0 cc pinhole vision for the right eye and blind left eye. The condition of the patient was inadequately maintained by the medications as the patient experienced some adverse reactions and difficulties on taking them. A trabeculectomy was then performed to lower the Intra Ocular Pressure (IOP) but then the complications occurred and the visual acuity was dropped to hand movement. A series of surgical procedures were performed to improve the outcomes. We then decided to close the trabeculectomy flap and performed phacoemulsification to the patient. The patient is then treated with multiple medications. After 9 months of follow up the visual acuity was improved to 1.0 cc and the IOP was maintained to its safe point.

**Conclusion:** Choosing the best treatment option is challenging given the high expectation of the patient to preserve the best visual acuity and the goal to reduce the IOP. A good assessment of possible etiology of angle closure will contribute as an aid to make a better surgical decision management. This case is a lens related problem, early lens removal can be beneficial to lower the IOP and open the angle at the same time before proceeding to trabeculectomy.

**Keywords:** Angle closure glaucoma; closed angle glaucoma; phacoemulsification; trabeculectomy; lens extraction

## Background

Up to nowadays, Glaucoma remains as the most common cause of irreversible blindness around the world. Anatomically, glaucoma can be divided into open and closed angles. The burden disease of the closed angle glaucoma is projected to increase as the number of people diagnosed with it is estimated to rise within the next few years. This is due to the increase of ageing population and improved health care awareness. In Asia, it is known that the occurrence of closed angle glaucoma is as common as open-angle glaucoma. By 2020, it is estimated that 20 million people will be affected by angle-closure glaucoma with a quarter of them predicted to experience blindness [1]. There are many currently available treatment options for closed angle glaucoma [2]. In this case report, we were presented with a patient with advanced stage of closed angle glaucoma accompanied with cataract. Considering the risks and benefits, we are challenged to select the best and the most suitable treatment.

## Case Presentation

The patient was a 54-year-old male presented with a closed angle with presentation of tunnel vision in Humphrey visual field of right eye (RE), while his left eye (LE) was already blind. Visual acuity of RE was 1.0 with mild cataract. The patient underwent a peripheral iridectomy at previous hospital. Intraocular pressure (IOP) was 22 mmHg maintained with Prostaglandin and Timolol eye drop. The patient experienced some adverse events regarding the medications he used. He also complained about the difficulty to access the medication and stated that he often forgets to administer his eye drops. Given this adverse events and bad compliance in medication, we decided to go for surgery. After we explained thoroughly to the patient, he agreed to be performed the surgery with the expectation of ceasing his current medications and improving his vision. We considered some suitable options for the patient. But after the thorough explanation about the

procedures and their risks, the patient was hesitant to be performed a combined surgery and chose trabeculectomy as the single procedure. The trabeculectomy was then performed.

On post-operative day 1, the patient's visual acuity was assessed as 1.0 cc. The examination found that the anterior chamber was slightly shallow and IOP was measured at 6 mmHg. The bleb was low diffused and the Seidel test was performed but the result was negative. We put on bandage lens as the precaution of unsuspected leakage and continued the observation. On post-operative day 3, the bandage lens was taken out since the chamber deepened and IOP increased to 10 mmHg. The patient came back on post-operative day 10 and his vision was dropped to 0.3, IOP was stable at 10 mmHg. The cornea was swollen with Descemet membrane folding due to the corneolens are touching each other. Several early trabeculectomy complications occurred, which were hypotonia, shallow anterior chamber (AC), corneal edema and Descemet's tear even after several surgical attempts to reform the anterior chamber. After those unsuccessful attempts, we finally decided to close the trabeculectomy flap and did phacoemulsification. The visual acuity at that time, was dropped to hand movement.

The patient was then treated with antibiotics eye drop, steroid eye drop, and hyperosmotic agent eye drop for almost a year before we started to taper down all his medications. The condition was resolved, and the visual acuity improved to 1.0 cc after 9 months of follow up with anti-inflammation and hyperosmotic agent eye drop continuously. IOP was controlled without post-operative medication until the last follow up.

### Discussion

The condition of the patient can be classified into the advanced stage of primary angle-closure glaucoma (PACG) uncontrolled with medications. There are many currently available options for the treatment of his condition. Those options are then narrowed down based on the severity of the disease. Earlier stage of the disease can be treated with medications and less invasive surgery such as lens extraction, or laser surgeries. While for the later stage, trabeculectomy remains as the main recommended treatment [2,3]. For initiating the treatment especially for the early stage, several regimens of medication are recommended, as the clinician then can add more medication to maintain the desirable intraocular pressure. But this is very much affected by the resources and the patients' compliance [2]. Prior to our treatments, the patient underwent a surgery which was peripheral iridectomy, and has taken some medications to control the IOP. His condition was not adequately maintained as the IOP was still measured at 22 mmHg with a 1.0 cc pinhole vision for the right eye and blind left eye. There are currently available treatment options for this patient, and we considered a combined surgery of phacoemulsification and trabeculectomy will produce the best outcome [3,4]. We tried to explain thoroughly regarding the benefits and risks of each options to the patient. The patient

was afraid that he will lose his vision and decided to be performed trabeculectomy only as the single procedure. The surgeon also thought that trabeculectomy can benefit in lowering the IOP without interfering the baseline visual acuity of the patient and with the aim to cease the current patient's medications as well. This decision was also considered to be the safest as performing lens extraction in patient with closed angle glaucoma is a challenging task due to the narrow angle [5-7].

For the efficacy, several studies have compared the outcomes of phacoemulsification as the single procedure, trabeculectomy as the single procedure, and the combined surgery. In chronic angle-closure glaucoma, after 24-months of follow up, both phacoemulsification and trabeculectomy can lower the patients' IOP with the reduction of 8.4 mmHg and 8.9 mmHg respectively ( $p = 0.76$ ). The study also mentioned that the occurrence of adverse event was higher in the trabeculectomy group than in the phacoemulsification group [4]. A review by American Association of Ophthalmology (AAO) showed that after some times of follow up, phacoemulsification can lower the IOP in patients with any types of glaucoma and can reduce the medications needed for the patients. The same review also mentioned that some of the studies stated that the need for further trabeculectomy can be decreased after phacoemulsification is successfully performed [8]. A multi centered randomized control trial was conducted to determine the outcomes of early lens extraction as the treatment of primary angle-closure glaucoma and reported to be more effective than laser peripheral iridotomy [9,10]. For the combined surgery of phacoemulsification and trabeculectomy, also known as phacotrabe had a greater IOP lowering effect and also decreasing the number of medications needed. This meta-analysis also mentions that although the combined surgery can provide the greater and better outcomes, it also carries the higher risk of complications [odds ratio (OR)=0.04, 95% CI (0.01 to 0.16), <0.00001] [4,11].

Although we agreed that surgical lens extraction is also beneficial, since age related growth of the lens plays a major role in the mechanism of PACG. It helps to improve the vision, reducing IOP and widened the angle. But cataract surgery in angle closure is always a challenging task. Shallow anterior chamber, poor mydriasis, weakness of zonular fibers that usually occurred in angle closure, can cause poor maneuver for the surgeon while performing cataract surgery [5-7]. This condition is prone to the occurrence of severe complications when performed incorrectly and requires a very expert surgeon in order to maximize the result [12]. Trabeculectomy is considered as an effective way to reduce IOP without risking the visual acuity according to the previous study [12,13]. After some considerations the trabeculectomy was then performed as the single procedure for this patient.

The IOP of the patient was maintained at 10 mmHg but the patient's visual acuity was decreased gradually and reached its lowest point where it was only able to distinguish hand

movement. On examination we found several early trabeculectomy complications which were hypotonia, shallow anterior chamber (AC), and corneal edema. Corneal edema and a profound Descemet membrane folding resulted in a very low vision [6,7]. We then performed another surgeries in order to reform the anterior chamber. Scrapping and removing corneal epithelial will help in order to have a clearer visibility. During the surgery, we found poor mydriasis of the pupil caused by the posterior synechiae and lens moving forward because of the zonulysis. Zonulysis was not found in the previous slit lamp examination, no phacodonesis sign was detected until that time. These procedures still could not improve the visual acuity. We then decided to close the trabeculectomy flap and perform the phacoemulsification.

After the lens extraction, the patient was given several medications and the visual acuity was increased slowly. After patiently waited, at 9 months of follow up, the visual acuity was back to 1.0 cc and IOP was maintained to its safe point. Deciding the best treatment for patients with closed angle glaucoma maybe challenging and requires correct and thorough assessment prior to the decision. The surgeon must also aware of any possible complications regarding the treatment that is chosen. Trabeculectomy remains as the best option in lowering the IOP but also carries the high risk of complications if it is not performed carefully. In this patient, the zonulysis occurred undetected when a prolonged iridolenticular contact causing the lens to adhere to the posterior part of the iris which also known as the synechiae. A good assessment of possible etiology of angle-closure glaucoma will contribute as a useful aid to make a better surgical decision management. This case was a lens related problem, early lens removal can be beneficial to lower the IOP and widen the angle at the same time before proceeding to trabeculectomy as the more definitive treatment.

## Conclusion

A careful and thorough assessment must be made prior to deciding which treatment is the most suitable for the patient. Treating the patient based on etiology and pathogenesis will provide the best outcomes. If the procedure fails, we should consider continuing the treatment as the improvement may appear late in the follow up.

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