


# Incident Numbers of Toxic Anterior Segment Syndrome and Posterior Capsular Opacification in Patients Post Senile Cataract Operation at Jec-Orbita Eye Clinic Makassar 2022

Feryansyah Akhbar Syamsir<sup>1\*</sup>, Sri Irmandha Kusumawardhani<sup>2</sup>, Siti Suleha Umar<sup>3</sup>, Zulfikri Khalil Novriansyah<sup>4</sup>, Diah Tantri Darkhutni<sup>5</sup>

<sup>1</sup>Program Studi Profesi Dokter Fakultas Kedokteran, Universitas Muslim Indonesia, <sup>2,3,4,5</sup>Departemen Ilmu Kesehatan Mata Fakultas Kedokteran, Universitas Muslim Indonesia

Article Info	ABSTRACT
<b>Keywords:</b> Senile Cataract, TASS, PCO	Cataracts are defined as an opacification process in the lens that prevents light from entering the deeper parts of the eye. Surgery is currently the definitive treatment for cataracts to optimize the patient's visual function. However, despite the benefits of surgery to optimize visual function, cataract surgery is not free from complications that can occur after surgery such as Toxic Anterior Segment Syndrome (TASS) and Posterior Capsular Opacification (PCO). This study aims to find out how many complications occur after cataract surgery in senile cataract patients in the form of TASS and PCO at the JEC-Orbita Makassar Eye Clinic in 2022. This research is a type of quantitative research using descriptive studies. The data used is secondary data in the form of medical record data taken from the JEC-Orbita Makassar Eye Clinic. The results obtained were that a total of 64 patients suffered from TASS and PCO after cataract surgery, with 52 patients (81.25%) suffering from PCO and 12 patients (18.75%) suffering from TASS. The most common gender was female as many as 41 patients (64.07%), the most common age range was 61-75 years as many as 37 patients (57.82%), the most surgical technique used was Phacoemulsification as many as 64 patients (100%) and the highest The highest maturity before surgery was grade IV senile cataract, 39 patients (60.94%).
This is an open access article under the <a href="https://creativecommons.org/licenses/by-nc/4.0/">CC BY-NC</a> license 	<b>Corresponding Author:</b> Feryansyah Akhbar Syamsir Program Studi Profesi Dokter Fakultas Kedokteran, Universitas Muslim Indonesia <a href="mailto:feryansyahsyamsir@gmail.com">feryansyahsyamsir@gmail.com</a>

## INTRODUCTION

Cataract is defined as an eye disease caused by the opacification process in the lens which was initially clear and becomes opaque, thus preventing the entry of light into the deeper parts of the eye. This disease is a progressive disease and can cause blindness. Cataracts initially begin without affecting the sufferer's daily activities, but as time goes by, especially around the fourth or fifth decade of life, cataracts can mature, causing the lens to become blurry and begin to interfere with daily vision. (Nizami & Gulami, 2022)

According to WHO, globally at least around 2.2 billion people suffer from visual impairment. Around 94 million people with visual impairment are caused by cataracts. (WHO, 2021) In addition, WHO estimates that population growth and aging will increase the risk of more people experiencing visual impairment. (Ang & Afshari, 2021) In Indonesia cataracts are also a cause most blindness. The estimated incidence of cataracts is 0.1% per year or around 1,000 people each year experience cataracts. Indonesia also tends to suffer from cataracts 15 years earlier than countries with subtropical climates. (Detty et al., 2021)

Surgery is currently the definitive treatment for cataracts. Supplementation has been proven to slow the progress of cataracts but cannot eliminate cataracts themselves. Surgery is performed to optimize the patient's visual function. (Astari, 2018) However, apart from the benefits of surgery to optimize visual function, cataract surgery cannot be free from complications that can occur both during and after surgery. One complication that can occur is posterior capsular opacification. Around 21.3% of patients suffer from posterior capsular opacification (PCO) as a long-term complication of post-cataract surgery. (Terveen et al., 2022) Another complication that can occur is toxic anterior segment syndrome (TASS) as a short-term complication. Research conducted by Gunawan et al. in 165 patients, it was found that 8 patients suffered from post-surgical complications suffering from toxic anterior segment syndrome. (Gunawan et al., 2019)

Based on the description above, researchers are interested in examining how many TASS and PCO complications occur in post-operative cataract patients. This was used as a background in creating a scientific paper with the title Incidence Rates of Toxic Anterior Segment Syndrome and Posterior Capsular Opacification in Patients After Senile Cataract Surgery at Jec-Orbita Eye Clinic Makassar in 2022.

## METHOD

This type of research uses a quantitative descriptive study with a retrospective approach. This research will be carried out at the JEC-Orbita Makassar Eye Clinic, Jl. A.P. Petterani, Makassar City. The instrument used in this research is medical record data from senile cataract patients who experienced post-operative TASS and PCO at the JEC-Orbita Makassar Eye Clinic on January 1 2022 – December 31 2022. The population that will be taken in this study are patients who have undergone cataract surgery and diagnosed with TASS and PCO caused by cataract surgery at the JEC-Orbita Makassar Eye Clinic from January to December 2022 with one operating operator. The sampling technique in research is total sampling. Total sampling is a sampling technique with the number of samples equal to the population. The data used in this research is secondary data. Data is obtained by looking at the diagnosis written in the patient's medical record. Medical records will be taken from the JEC-Orbita Makassar Eye Clinic at a certain time interval. In collecting data, the researcher explained and asked for approval from the medical records manager of the JEC-Orbita Makassar Clinic. The confidentiality of patient information in medical records is guaranteed by researchers.

## RESULTS

This research was carried out by taking data from the JEC-Orbita Makassar Eye Clinic, South Sulawesi. This research was carried out by collecting secondary data in the form of medical records of patients after cataract surgery who were diagnosed with complications after cataract surgery by one operator from January 2022 to December 2022. From the data collection carried out, a total of 64 patients who met the criteria were obtained. A total of 64 patients were distributed according to the patient's demographic characteristics based on gender, age, surgical technique, maturity level, and complications that occurred in the patient..

**Table 1.** Patient characteristics by gender

Variabel	Frequency	
Gender	n	%
Man	23	35,93%
Woman	41	64,07%
Total	64	100%

Of the 64 patients, a gender distribution was obtained, namely 41 (63.07%) female patients and 23 (36.93%) male patients from the total number of patients.

**Table 2.** Patient characteristics based on age

Age	Frequency	
	N	%
25 – 44 Years	4	6,25%
45 – 60 Years	14	21,87%
61 – 75 Years	37	57,82%
76 – 90 Years	8	12,5%
>90 Years	1	1,56%
Total	64	100%

Of the 64 patients, the distribution for age distribution was obtained, namely in the age range 61-75 years, namely 37 patients (57.82%) while the lowest distribution was in the age range above 90 years, namely 1 patient (1.56%).

**Table 3.** Patient characteristics based on surgical technique

Operational Techniques	Frequency	
	N	%
Fakoemulsifikasi	64	100%
SICS	0	0%
ICCE	0	0%
ECCE	0	0%
Total	64	100%

Of the 64 patients, it was found that all surgical techniques performed on 64 patients used the phacoemulsification surgical technique (100%).

**Table 4.** Patient characteristics based on cataract maturity

Operational Techniques	Frequency	
	N	%
Grade I (Lamellar)	0	0%
Grade II (Iminens)	0	0%
Grade III (Imatur)	15	23,43%
Grade IV (Matur)	39	60,94%
Grade V (Hiper matur)	10	15,63%
Total	64	100%

Of the 64 patients, 15 patients (23.43%) suffered from immature cataracts, 39 patients (60.94%) suffered from mature cataracts, and 10 patients (15.63%) suffered from hypermature cataracts.

**Table 5** Patient characteristics based on complications suffered

Operational Techniques	Frequency	
	N	%
TASS	12	18,75%
PCO	52	81,25%
Total	64	100%

Of the 64 patients, 12 patients (18.75%) suffered from toxic anterior segment syndrome (TASS), and 52 patients (81.25%) suffered from posterior capsular opacification (PCO).

## Discussion

Cataract is a disease that has caused the most blindness, especially in Indonesia. Advances in technological developments, especially in the medical field, have made rapid progress in providing definitive management of cataracts, namely surgery. However, advances in cataract management still do not rule out the possibility of eliminating complications in the future. (Nizami & Gulami, 2022)

This research was conducted by looking at 64 medical records of patients who had undergone cataract surgery and experienced complications resulting from a history of previous cataract surgery. The results obtained were that there were 2 diseases that occurred after cataract surgery. These diseases are Posterior Capsular Opacification (PCO) and Toxic Anterior Segment Syndrome (TASS).

Posterior Capsular Opacification (PCO) is a condition where secondary cataract formation occurs and is the main complication that occurs after installing an intraocular lens. (Konopińska et al., 2021) In this study, 52 patients (81.25%) suffered from PCO. The results obtained are in line with Wang et al. which states that PCO is the most common late complication after cataract surgery. The incidence of PCO is around 18-50%, which

increases every year in senile cataracts. (Kohnen et al., 2022) This result is inversely proportional to the research of Gunawan et. The one with the most complications that occurred was at the Family Medical Center Hospital, TASS. (Gunawan et al., 2019) PCO can occur in up to 100% of children with congenital cataracts, but in the study no samples of children were found. PCO in children occurs due to migration and proliferation of residual lens epithelial cells that occur after cataract surgery. Generally, this situation occurs more frequently and is more severe in children with congenital cataracts due to increased mitotic activity. (Kwon et al., 2022)

Toxic Anterior Segment Chamber (TASS) is a post-operative non-infectious inflammatory condition of the anterior segment due to the presence of toxic substances in contact with the eye. Generally, this situation occurs acutely, namely 12 - 48 hours after surgery, but this situation can also occur several days to months after surgery. This disease can resemble endophthalmitis, which is also one of the complications that can occur after cataract surgery. Even though both have the same clinical condition, the management of both is different. (Hernandez-Bogantes et al., 2019) In this study, 12 patients (18.75%) experienced TASS. This finding is in line with research conducted by Gunawan et al. Those who received TASS were the most common complications at the Family Medical Center Hospital, namely 8 patients out of 165 patients who underwent cataract surgery. (Gunawan et al., 2019) However, research conducted by Natasya et al. At H. Abdul Manap Regional Hospital, Jambi City, there were no TASS complications from 193 patients undergoing cataract surgery. (Hanis et al., 2023) TASS generally occurs due to lack of sterilization of the tools that will be used in surgical activities. In research conducted by Choi et al. There were 15 cases of TASS that occurred after phacoemulsification surgery with five different operators. (Choi & Shyn, 2008)

In general, older age has a higher risk factor for complications after cataract surgery. In this study, it was found that only 4 patients were still in the young adult category, namely 25-44 years, while the rest were over the age of 44 years which could be said to be in the old adult to elderly category. The older you get, the more susceptible you are to complications due to the greater degeneration process in the eyeball. The study conducted by Lin et. al stated that complications generally occur more frequently in operated patients over 50 years of age. (Lin et al., 2021)

In this study, it was found that women were more likely to suffer complications after cataract surgery. These results are in line with research conducted by Lin et al. stated that male gender is not a significant factor for complications after cataract surgery. This is because there are other eye disorders that generally have a greater prevalence in women, such as glaucoma, so the ratio of male patients is lower..(Lin et al., 2021)

Advances in technological developments in the medical field have encouraged the discovery of therapies, especially in surgery, which increasingly minimize the risk of undesirable events occurring after surgery. In this study, it was found that the surgical technique was carried out on all patients by one operator who was chosen to use the phacoemulsification technique in carrying out the operation. (Adams & Steel, 2023)

Phacoemulsification is a technique using ultrasound technology so large sutures are rarely performed because the incisions made are small. This explains the lack of complications that occur due to the method used, namely the phacoemulsification method. There were no studies or articles related to the level of cataract maturity on the occurrence of complications after cataract surgery. Bearing in mind that in cataract surgery procedures the lens is generally removed completely without leaving the old lens behind. The author suggests that this could be a consideration for further research regarding the relationship between the level of cataract maturity and the occurrence of complications after surgery. The limitation of this research is that this research is a descriptive study, so this research only records complications that occur in patients without recording and correlating risk factors for eye disorders or systemic disorders that exist in patients that may be related to the complications that occur.

### CONCLUSION

After conducting research at the JEC-Orbita Makassar Eye Clinic, it can be concluded that there were 64 patients who experienced TASS and PCO complications after cataract surgery. Phacoemulsification technique is the most widely used surgical technique. Female gender, age range 61-75, and grade IV cataract maturity were the most common in 64 patients.

### REFERENCES

- Abel, R. (2018). Cataracts. In *Integrative Medicine: Fourth Edition* (Fourth Edi). Elsevier Inc. <https://doi.org/10.1016/B978-0-323-35868-2.00084-0>
- Adams, W., & Steel, D. H. (2023). 5.11. Phacoemulsification Fluidics. In *Ophthalmology*. INC. <https://doi.org/10.1016/B978-0-323-79515-9.00065-7>
- Ang, M. J., & Afshari, N. A. (2021). Cataract and systemic disease: A review. *Clinical and Experimental Ophthalmology*, 49(2), 118–127. <https://doi.org/10.1111/ceo.13892>
- Astari, P. (2018). Katarak: Klasifikasi, Tatalaksana, dan Komplikasi Operasi | Astari | Cermin Dunia Kedokteran. *Astari, Prilly*, 45 No. 10(CDK), 748–753. <http://103.13.36.125/index.php/CDK/article/view/584/362>
- Bailey, M. D., & Ahmed, M. U. (2023). 1. Pathology and Classification of Cataracts. In *Steinert's Cataract Surgery*. INC. <https://doi.org/10.1016/B978-0-323-56811-1.00001-8>
- Choi, J. S., & Shyn, K. H. (2008). Development of toxic anterior segment syndrome immediately after uneventful phaco surgery. *Korean Journal of Ophthalmology: KJO*, 22(4), 220–227. <https://doi.org/10.3341/kjo.2008.22.4.220>
- Cicinelli, M. V., Buchan, J. C., Nicholson, M., Varadaraj, V., & Khanna, R. C. (2023). *Seminar Cataracts*. 6736(22). [https://doi.org/10.1016/S0140-6736\(22\)01839-6](https://doi.org/10.1016/S0140-6736(22)01839-6)
- Detty, A. U., Artini, I., & Yulian, V. R. (2021). Karakteristik Faktor Risiko Penderita Katarak. *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(1), 12–17. <https://doi.org/10.35816/jiskh.v10i1.494>

- Gunawan, S., Lesmana, M. I., & Winaktu, G. J. M. . (2019). Prevalensi Komplikasi Operasi Katarak dengan Teknik Fakoemulsifikasi di Rumah Sakit Family Medical Center Periode Januari -Desember 2016. *Jurnal Kedokteran Meditek*, 24(67), 11–16. <https://doi.org/10.36452/jkdoktmeditek.v24i67.1680>
- Hanis, N., Mayani, G., & Hanina. (2023). Gambaran Perbaikan Visus Serta Komplikasi Intraoperasi atau Pascaoperasi Pada Pasien Operasi Katarak Senilis di RSUD H. Abdul Manap Kota Jambi Periode Januari 2021 - Desember 2021. *Joms*, 3(1), 22–38.
- Hernandez-Bogantes, E., Navas, A., Naranjo, A., Amescua, G., Graue-Hernandez, E. O., Flynn, H. W., & Ahmed, I. (2019). Toxic anterior segment syndrome: A review. *Survey of Ophthalmology*, 64(4), 463–476. <https://doi.org/10.1016/j.survophthal.2019.01.009>
- Hessen, Trexlet, M. (2022). *Clinical Overview of Cataract*. Elsevier, Singapore. [https://www.clinicalkey.com/#!/content/clinical\\_overview/67-s2.0-a56c8957-cec5-4bf3-9c32-8bd05fdf03da](https://www.clinicalkey.com/#!/content/clinical_overview/67-s2.0-a56c8957-cec5-4bf3-9c32-8bd05fdf03da)
- Hoffman, S. (2022). Cataracts. In *Ferri's Clinical Advisor 2022* (p. 346).
- Howes, F. W. (2022a). Indications for Lens Surgery/Indications for Application of Different Lens Surgery Techniques. In *Ophthalmology*. INC. <https://doi.org/10.1016/b978-0-323-04332-8.00060-3>
- Howes, F. W. (2022b). Manual Cataract Extraction. In *Ophthalmology*. INC. <https://doi.org/10.1016/b978-0-323-04332-8.00066-4>
- Howes, F. W. (2022c). Patient Work-up for Cataract Surgery. In *Ophthalmology*. INC. <https://doi.org/10.1016/b978-0-323-04332-8.00059-7>
- James, B., & Bron, A. (2011). The Lens and Cataract. In *Ophthalmology Lecture Note* (p. 118). <https://www.ptonline.com/articles/how-to-get-better-mfi-results>
- Kemendes, R. (2018). Infodatin Situasi Gangguan Penglihatan. *Kementrian Kesehatan RI Pusat Data Dan Informasi*, 11. <https://pusdatin.kemkes.go.id/download.php?file=download/pusdatin/infodatin/infodatin-Gangguan-penglihatan-2018.pdf>
- Khurana, A. (2018). *Comprehensive Ophthalmology*. In *Comprehensive Ophthalmology*. <https://doi.org/10.5005/jp/books/12532>
- Kohnen, T., Masker, S., Wang, L., & Friedman, N. (2022). Complications of cataract surgery. In *Ophthalmology* (Vol. 4). INC. <https://doi.org/10.1016/j.bloc.2017.09.002>
- Konopińska, J., Młynarczyk, M., Dmuchowska, D. A., & Obuchowska, I. (2021). Posterior capsule opacification: A review of experimental studies. *Journal of Clinical Medicine*, 10(13). <https://doi.org/10.3390/jcm10132847>
- Kwon, Y. R., Hwang, Y. N., & Kim, S. M. (2022). Posterior Capsule Opacification after Cataract Surgery via Implantation with Hydrophobic Acrylic Lens Compared with Silicone Intraocular Lens: A Systematic Review and Meta-Analysis. *Journal of Ophthalmology*, 2022. <https://doi.org/10.1155/2022/3570399>
- Lin, I. H., Lee, C. Y., Chen, J. T., Chen, Y. H., Chung, C. H., Sun, C. A., Chien, W. C., Chen, H. C., & Chen, C. L. (2021). Predisposing factors for severe complications after cataract

- surgery: A nationwide population-based study. *Journal of Clinical Medicine*, 10(15). <https://doi.org/10.3390/jcm10153336>
- Mcguffey, C. D., Hackett, N., Basti, S., & Houser, K. (2023). Preparation of the Cataract Patient. In *Steinert's Cataract Surgery*. INC. <https://doi.org/10.1016/B978-0-323-56811-1.00002-X>
- Nastya, F. (2022). *Gambaran Perbaikan Visus Serta Komplikasi Intraoperasi atau Pascaoperasi Pada Pasien Operasi Katarak Senilis di RSUD H. Abdul Manap Jambi Periode Januari 2021 - Desember 2021*.
- Nizami, A., & Gulami, A. (2022). Cataract. *StatPearls*. <https://www.ncbi.nlm.nih.gov/books/NBK539699>
- Packer, M. (2023). 5.13. Small-Incision and Femtosecond Laser-Assisted Cataract Surgery. In *Ophthalmology*. INC. <https://doi.org/10.1016/B978-0-323-79515-9.00067-0>
- Park, C. Y., Lee, J. K., & Chuck, R. S. (2018). Toxic anterior segment syndrome-an updated review. *BMC Ophthalmology*, 18(1), 1–9. <https://doi.org/10.1186/s12886-018-0939-3>
- Salmon, J. (2022). Lens. In *Kanski's Clinical Ophthalmology* (pp. 307–343).
- Terveen, D., Berdahl, J., Dhariwal, M., & Meng, Q. (2022). Real-World Cataract Surgery Complications and Secondary Interventions Incidence Rates: An Analysis of US Medicare Claims Database. *Journal of Ophthalmology*, 2022. <https://doi.org/10.1155/2022/8653476>
- Thompson, J., & Lakhani, N. (2015). Cataracts. *Primary Care - Clinics in Office Practice*, 42(3), 409–423. <https://doi.org/10.1016/j.pop.2015.05.012>
- Wevill, M. (2022). Epidemiology, Pathophysiology, Causes, Morphology, and Visual Effects of Cataract. In *Ophthalmology*. INC. <https://doi.org/10.1016/b978-0-323-04332-8.00073-1>
- WHO. (2021). Key Facts: Blindness and vision impairment. *World Health Organization*, 11(2018), 5–9. <https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment>