

## Case Report

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## Case Report: Choroidal Detachment following Trabeculectomy in a 60-Year-Old Female with Type 2 Diabetes

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### ABSTRACT

This case report describes a rare complication of choroidal detachment following trabeculectomy in a 60-year-old female with type 2 diabetes. The patient, on-compliant with her diabetes medication regimen, presented with elevated Intraocular Pressure (IOP) and glaucomatous optic neuropathy. preoperative examination revealed open-angle glaucoma with a Shaffer grade of 30 degrees, optic nerve cupping, haemorrhage, and a cup-to-disc ratio greater than 0,7 Optical Coherence Tomography (OCT) confirmed non-proliferative diabetic retinopathy. trabeculectomy with an inverted scleral flap valve mechanism was performed under local anaesthesia.

postoperatively, the patient experienced severe leakage from the surgical site, followed by choroidal detachment one-day post-surgery, presenting with blurred vision, scotoma, pain, photophobia, shallow anterior chamber, and low IOP (3mm HG). B scan ultrasonography revealed a large anterior, serous choroidal detachment. OCT showed choroidal thickening and hypo reflective areas consistent with fluid accumulation. initial management included a pressure patch, cycloplegics, intravenous fluids, and IOP-lowering medications.

Surgical intervention was also performed. close monitoring, close monitoring and follow-up examinations with IOP measurements, B scan, and OCT documented progressive resolution of the choroidal detachment over one year. Final assessment indicated complete resolution with stable IOP and no significant visual impairment. this case highlights the risk of choroidal detachment, particularly in patients with diabetes, even after seemingly uncomplicated trabeculectomy. it emphasizes the importance of meticulous surgical technique, vigilant postoperative monitoring, and prompt management to minimise vision- threatening complications.

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### Overview of Glaucoma and its Surgical Treatments

Glaucoma is a group of eye conditions that damage the optic nerve, often due to high Intraocular Pressure (IOP). It is a leading cause of blindness, particularly in older adults. The two main types are open-angle glaucoma and angle-closure glaucoma [1].

### Surgical Treatment Options

#### Trabeculectomy

- **Procedure:** Creates a new drainage pathway for the aqueous humour to lower IOP.
- **Indications:** Used when medications and laser treatments are insufficient.
- **Risks:** Includes infection, bleeding, and complications like choroidal detachment [2].

### Glaucoma Drainage Devices (Shunts)

- **Procedure:** Involves implanting a small tube to help drain excess fluid from the eye.
- **Indications:** Often used in cases where trabeculectomy has failed or is not suitable.
- **Risks:** Similar to trabeculectomy, with additional risks related to the implant.

### Laser Surgery

- **Types:** Includes laser trabeculoplasty, iridotomy, and cyclophotocoagulation.
- **Procedure:** Uses laser energy to improve fluid drainage or reduce fluid production.
- **Indications:** Often a first-line treatment or used in conjunction with medications.
- **Risks:** Generally lower risk, but may include inflammation and temporary increase in IOP.

### Minimally Invasive Glaucoma Surgery (MIGS)

- **Procedure:** Involves smaller incisions and devices to enhance fluid outflow.
- **Indications:** Suitable for mild to moderate glaucoma.
- **Risks:** Lower risk of complications compared to traditional surgeries

These surgical options aim to reduce IOP and prevent further optic nerve damage, thereby preserving vision. The choice of surgery depends on the type and severity of glaucoma, as well as the patient's overall health and response to previous treatments. **Choroidal detachment** is a relatively rare but serious complication that can occur after ocular surgeries, including glaucoma procedures. It involves the separation of the choroid, a vascular layer of the eye, from the sclera. This condition can be classified into two types: serous (fluid-filled) and haemorrhagic (blood-filled) detachments.

- Choroidal detachment is uncommon, particularly in the context of glaucoma surgery. Its incidence varies but is generally low compared to other postoperative complications.
- Haemorrhagic choroidal detachment is even rarer and typically occurs due to the rupture of choroidal vessels, often during or after surgery.

### Significance

- **Visual Impact:** Choroidal detachment can lead to significant visual impairment if not promptly diagnosed and treated. It can cause symptoms such as blurred vision, eye pain, and a sensation of pressure in the eye.
- **Complication Management:** Managing choroidal detachment requires careful monitoring and, in some cases, surgical intervention to drain the accumulated fluid or blood. The timing and approach to surgery are critical to prevent further complications and preserve vision.
- **Risk Factors:** Factors such as hypotony (low intraocular pressure), surgical trauma, and systemic conditions like diabetes can increase the risk of developing choroidal detachment.

Understanding the rarity and potential severity of choroidal detachment underscores the importance of vigilant postoperative care and patient education to ensure early detection and effective management.

### Patient Information

- **Age and Gender:** 60-year-old female
- **Medical History:** Known case of type 2 diabetes, managed with glibenclamide and metformin
- **Medication Adherence:** Non-compliant with medication regimen
- **Current Medications:** Latanoprost, Timolol, and Brimonidine eye drops
- **Surgical and Other Medical History:** No other significant surgical or medical history reported
- **Vital Signs:** BCVA=1\10 WITH SNELEN CHART
- **Blood Glucose Levels:** Within normal range
- **Diagnostic Tests and Equipment**
- **Ophthalmic Examination**
- **Slit-Lamp Examination:** To assess the anterior segment of the eye.
- **Findings:** Corneal epithelium was swollen, but other parts of the anterior segment appeared normal.
- **Gonioscopy:** To evaluate the angle between the iris and cornea.
- **Findings:** Using a three-mirror lens, the angle was open with

a Shaffer grade of 30 degrees.

- **Fundus Examination:** To check the retina and optic nerve head.
- **Findings:** significant signs of diabetic non retinopathy were observed. However, key glaucoma indicators were present, including a clear optic nerve cupping, optic nerve haemorrhage, and a cup-to-disc ratio greater than 0.7.

### Diagnostic Tests and Equipment

#### Ophthalmic Examination

**Slit-Lamp Examination:** To assess the anterior segment of the eye.

- **Findings:** Corneal epithelium was swollen, but other parts of the anterior segment appeared normal.

**Gonioscopy:** To evaluate the angle between the iris and cornea.

- **Findings:** Using a three-mirror lens, the angle was open with a Shaffer grade of 30 degrees.

**Fundus Examination:** To check the retina and optic nerve head.

- **Findings:** No significant signs of diabetic retinopathy were observed. However, key glaucoma indicators were present, including a clear optic nerve cupping, optic nerve haemorrhage, and a cup-to-disc ratio greater than 0.7.

### Imaging and Measurements

#### Optical Coherence Tomography (OCT)

- **Findings:** OCT of the optic nerve head and retina showed signs of non-proliferative diabetic retinopathy.

#### B-scan Ultrasonography

- **Findings:** Preoperative B-scan was normal.

### Intraocular Pressure (IOP) Monitoring

#### Goldmann Applanation Tonometry

- **Findings:** IOP was measured four times, with an average preoperative IOP of 21 mmHg.

**Diurnal IOP Variation:** Monitoring IOP at different times of the day to understand fluctuations.

### Laboratory Tests

#### Blood Glucose Levels

- **Findings:** Daily blood glucose monitoring was performed, with an average preoperative.140mmg.

#### HbA1c

- **Findings:** HbA1c was 6, indicating good long-term glucose control.

### Assessment of Patient Compliance

**Medication Adherence:** Assessment of patient adherence to prescribed medications using a questionnaire

**Findings:** Patient adherence was not good and we discontinued eye drops two days before surgery and switched the patient to oral acetazolamide 250 mg twice daily. After surgery, acetazolamide was discontinued.

### Surgical Procedure

- **Type of Surgery:** New Trabeculectomy.
- **Location:** Tishreen Hospital.
- **Anaesthesia:** Local Anaesthesia.
- **Surgical Details Inverted Scleral Flap Valve Mechanism:** After performing trabeculectomy and forming a flap from the sclera and conjunctiva, the flap is inverted so that its inner surface (which was facing the anterior chamber) faces outward and its outer surface (which was facing the conjunctiva) faces inward. The inverted flap is placed in the trabeculectomy opening, ensuring its edges cover the opening tightly and are secured with surgical sutures.

### Postoperative Course

- **Immediate Postoperative Period:** Severe leakage from the surgical site noted.
- **Complication:** Development of choroidal detachment one day post-surgery.

### Choroidal Detachment: Signs and Symptoms

- After the surgery, we noticed that the patient had blurred vision.
- **Scotoma:** She felt a shadow or curtain over part of her visual field and experienced annoying pain. Her eye was red, and she felt nauseous.
- **Photophobia:** She was sensitive to bright light.

### Clinical Findings

- During the examination with the slit lamp, we observed the following
- **Shallow Anterior Chamber:** The depth of the anterior chamber was less than usual, due to the forward displacement of the lens-iris diaphragm, leading to a reduced depth of the anterior chamber.
- **Observations in the Posterior Part of the Eye:** We saw fluid accumulation in the form of convex and reflective lines. These lines remain stable during eye movements.
- **Inflammation and Redness:** We noticed inflammation and redness in the eye due to the inflammatory reaction to the choroidal detachment. This inflammation can increase the eye's sensitivity to light and cause pain.
- **Low Intraocular Pressure:** The intraocular pressure was as low as 3 mmHg, which occurs due to fluid leakage from the eye.

### Diagnostic Testing

#### B-Scan Ultrasonography Findings after Complications

We used B-scan ultrasonography after complications

- **Dome-Shaped Elevation:** The detachment appeared as a smooth, dome-shaped elevation on the ultrasound.
- **Serous Detachment:** Hypo reflective (dark) areas were observed due to fluid accumulation in the suprachoroidal space.
- **Movement:** No movement was seen on dynamic ultrasound, distinguishing it from retinal detachment, which shows more mobility.
- **Extent and Location:** The extent of the detachment was large and primarily anterior, helping to differentiate it from retinal detachment.

Typically, dome-shaped elevations with echolucent (dark) areas indicate fluid accumulation. After initial treatment, B-scan ultrasonography showed a reduction in the height of the choroidal elevation and a decrease in the echolucent areas [5].

- **Hemorrhagic Detachments:** If the detachment was hemorrhagic, B-scan can show the process of clot lysis. Initially, the hemorrhage appears as echogenic (bright) areas, which gradually become more echolucent as the clot liquefies [6].
- **Follow-Up Scans**
- We used continuous B-scan ultrasonography to ensure the resolution of the choroidal detachment. The scans showed progressive flattening of the choroidal elevations and normalization of the suprachoroidal space [7].
- If the detachment persists, B-scan can help identify any residual fluid or complications such as retinal detachment or hypotony maculopathy [7].
- **Final Assessment**
- Successful treatment is indicated by the complete resolution

of the choroidal detachment on B-scan ultrasonography. The choroid should appear reattached and free of residual fluid [7].

- **Complications:** Any complications, such as persistent fluid or new detachments, can be detected early with regular B-scan monitoring [3].

### OCT Findings After Choroidal Detachment

#### Optical Coherence Tomography (OCT)

- "We had choroidal thickening (an increase in choroidal thickness due to fluid accumulation or hemorrhage)."
- **Hyporeflective Areas:** We observed areas with low reflectivity indicating fluid or blood in the suprachoroidal space.
- **Retinal Changes:** Despite the extensive choroidal detachment, there was no retinal detachment [18].
- **Altered Choroidal Circulation:** Changes in the dynamics of choroidal blood flow, which can be visualized as areas with altered reflectivity.
- **Initial Post-Treatment**
- **Reduction of Subretinal Fluid:** OCT observed a reduction in subretinal fluid with the resolution of choroidal detachment. This was seen as a decrease in hyporeflective (dark) spaces between the retina and choroid [8].
- **Retinal Reattachment:** The retina appeared closer to the underlying choroid, indicating successful reattachment [9].
- Intermediate Follow-Up

**Retinal layers:** The retinal layers returned to their normal appearance and thickness [10].

**Monitoring for complications:** OCT did not observe any complications such as persistent subretinal fluid, macular edema, or new retinal detachments [11,12].

#### Final Assessment

**A Successful Treatment:** Complete resolution of choroidal detachment was demonstrated. OCT showed a normal retina without residual fluid [6].

- **Evaluation of Retinal Health:** OCT assessed the overall health of the retina and ensured there were no signs of atrophy or other long-term damage [9].

### Management and Outcome

#### Initial Management

- **Immediate Steps:** The patient was closely monitored for signs of hypotony and choroidal detachment. Measures were taken to manage the severe leakage from the surgical site, including the application of a pressure patch and the use of cycloplegic agents to stabilize the eye.
- **Medical Interventions:** Intravenous fluids and medications to control intraocular pressure were administered.
- We have **surgical intervention too**.
- Follow up
- **Post-Operative Care:** To monitor the intraocular pressure, the intraocular pressure was measured 4 times a day, and the patient was scheduled for frequent follow-up visits for the condition of the choroidal detachment and the overall health of the eye. We included the results of the follow-up in the table below

Time Period	Mean Intraocular Pressure (mmHg)
First day	3.19
Second day	4.60
Third day	5.50
Fourth day	5.80

Fifth day	7.60
Sixth day	9.70
Seventh day	10.10
Fourteenth day	12.60

- **Additional Interventions:** Detachment resolved with initial management, regular imaging (OCT and B-scan ultrasound) was used to assess progress. For the patient, one week after the operation, 3 months after, 6 months after, and after one year, the results are written in the table below

Stage	B-Scan Findings	OCT Findings
Before Treatment	- Confirmed presence and extent of choroidal detachment. - Dome-shaped elevations with echogenic areas indicating fluid accumulation.	- Choroidal thickening due to fluid accumulation or haemorrhage. - Hypo reflective areas indicating fluid or blood in the suprachoroidal space.
One Week After Treatment	- Significant improvement in choroidal detachment. - Decrease in choroidal height and echogenic areas.	- Reduction in subretinal fluid. - Retina appeared closer to the underlying choroid, indicating successful reattachment.
Three Months After Treatment	- Near complete resolution of choroidal detachment. - Progressive flattening of choroidal elevations and normalization of the suprachoroidal space.	- Retinal layers returned to their normal appearance and thickness. - No complications such as persistent subretinal fluid, macular edema, or new retinal detachments observed.
Six Months After Treatment	- Complete resolution of choroidal detachment. - No signs of inflammation or retinal issues.	- Retinal layers returned to their normal appearance and thickness. - No complications such as persistent subretinal fluid, macular edema, or new retinal detachments observed.
One Year After Treatment	- Vision improved even better than before surgery. - No signs of glaucoma or detachment. - Complete resolution of choroidal detachment. Choroid appeared reattached and free of residual fluid.	- Complete resolution of choroidal detachment. - Normal retina without residual fluid. - Overall health of the retina assessed, ensuring no signs of atrophy or other long-term damage.

### Scientific Comparison between B-Scan and OCT

#### B-Scan

##### Advantages

- Provides detailed evaluation of internal eye structures and diagnosis of choroidal detachment.
- Shows changes in height and echogenic areas over time.
- Helps identify the presence of fluid or blood in the suprachoroidal space.

##### Disadvantages:

- May not show detailed layers of the retina as clearly.
- Requires precise interpretation by a specialist.

#### OCT

##### Advantages

- Provides high-resolution images of retinal and choroidal layers.
- Shows changes in thickness and reflectivity of layers.
- Assesses overall retinal health and detects potential complications such as macular edema or new detachments.

##### Disadvantages

- May have limitations in diagnosing larger or more complex detachments.
- Requires advanced and specialized equipment.

#### Outcome

- **Recovery:** The patient's recovery was closely monitored. With appropriate management, the choroidal detachment resolved, and the intraocular pressure stabilized.
- **Current Status:** The patient achieved a stable postoperative state with controlled intraocular pressure and no significant visual impairment. Long-term follow-up was planned to ensure continued eye health and prevent recurrence.

#### B-Scan Ultrasonography (B-Scan)

- **Easiest and Fastest:** B-Scan is the easiest and fastest method to monitor the condition of choroidal detachment. It can detect any remaining fluid or new detachment.
- **Initial Assessment:** Used to confirm the presence of choroidal detachment and determine its extent.
- **Post-Treatment Monitoring:** Helps in observing the reduction in the height of the choroidal elevation and the absorption of fluids.

#### Optical Coherence Tomography (OCT)

- **Detailed Imaging:** Provides high-resolution images of the retinal and choroidal layers.
- **Monitoring Subretinal Fluid:** Can show the reduction of subretinal fluid and the reattachment of the retina to the choroid.
- **Assessing Retinal Health:** Helps in detecting any complications such as macular edema or new retinal detachments.

#### Visual Acuity Measurement

- **Vision Assessment:** Measures visual acuity to evaluate the impact of the treatment on vision.
- **Monitoring Improvement:** Helps in tracking the improvement in vision after treatment.

#### Intraocular Pressure Measurement

- **Pressure Monitoring:** Measures intraocular pressure to ensure there is no abnormal increase, which could indicate complications such as glaucoma.
- **Stability Assessment:** Helps in confirming the stability of the eye condition after treatment.

#### Key Steps for Patient Follow-Up

- **Visual Acuity Measurement:** To evaluate the impact on vision.
- **Intraocular Pressure Measurement:** To ensure stable intraocular pressure and detect any complications.
- **B-Scan:** The easiest and fastest for general assessment.

- **OCT:** For detailed imaging of the retina and choroid.

## References

1. Kierstan Boyd (2020) What Is Glaucoma? Symptoms, Causes, Diagnosis, Treatment. American Academy of Ophthalmology. Available at: <https://www.aaopt.org/eye-health/diseases/what-is-glaucoma>.
2. Glaucoma - Diagnosis and treatment. Mayo Clinic. Available at: <https://www.mayoclinic.org/diseases-conditions/glaucoma/diagnosis-treatment/drc-20372846>.
3. Ferhina S Ali, Shree K Kurup, Sunir J Garg (2018) Dealing With Hemorrhagic Choroidal Detachments. Available at: <https://retinatoday.com/articles/2018-may-june/dealing-with-hemorrhagic-choroidal-detachments#:~:text=Hemorrhagic%20choroidal%20detachments%20can%20be,elevated%20secondary%20to%20angle%20closure>.
4. Choroidal Detachment. Available at: <https://www.asrs.org/content/documents/fact-sheet-3-lp-choroidal-detachment-r1-alt-layout.pdf>.
5. Choroidal Detachment: Background, Pathophysiology, Epidemiology. Available at: <https://emedicine.medscape.com/article/1190349-overview?form=fpf>.
6. Zachary Bodnar, Prithvi Mruthyunjaya (2018) Management of Uveal Effusion Syndrome. Retina Today pp: 18-22.
7. Choroidal Detachment: Diagnosis and Management. Available at: Journal of Ophthalmology.
8. Choroidal Detachment. Available at: <https://www.asrs.org/patients/retinal-diseases/11/choroidal-detachment>.
9. Jessica Haynes, Mohammad Rafieetary (2023) OCT: An Indispensable Tool in Retina Care. Available at: <https://www.reviewofoptometry.com/article/oct-an-indispensable-tool-in-retina-care#:~:text=OCT%20imaging%20of%20posterior%20segment,nevus%20and%20a%20choroidal%20melanoma>.
10. Nadia K Waheed, Luísa SM Mendonça, Lucy H Young (2023) Choroidal Effusions and Detachments. Available at: [https://link.springer.com/referenceworkentry/10.1007/978-3-030-42634-7\\_125](https://link.springer.com/referenceworkentry/10.1007/978-3-030-42634-7_125).
11. Mitamura M, Kase S, Yamashita Y, Hirooka K, Ishida S (2023) Alterations in choroidal circulatory dynamics and choroidal thickness before and after treatment in posterior scleritis. BMC Ophthalmol 23: 382.
12. Diep MQ, Madigan MC (2019) Choroidal detachments: what do optometrists need to know? Clin Exp Optom 102: 116-125.

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