Gonioscopy-assisted transluminal trabeculotomy in specific severe paediatric glaucoma cases

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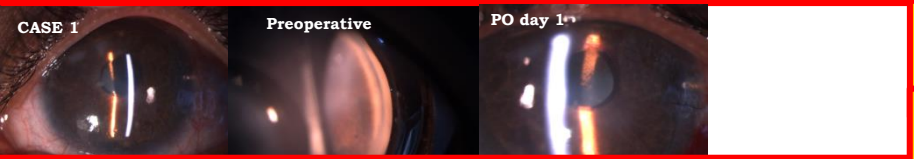
AIM

To report clinical characteristics and surgical outcomes of GATT procedure in certain types of severe paediatric glaucoma cases, including PCG (2 cases), isolated microcornea (1 case) and silicone-oil induced glaucoma (1 case).

CASE 1

14 year-old female with bilateral PCG. She had received multiple surgeries (Trabeculotomy , AGV in OD and trabeculotomy, trabeculectomy in OS). She was on maximally tolerated topical medication (OU). VO was HM in OD and 0.1 in OS. IOP was 28 mmHg in OD and 37 mmHg in OS. Both eyes were severe buphthalmic with residual corneal scarring. She had high optic disc cupping in OU. Angle appearance was relatively optimal for angle surgery in OS. GATT was planned in OS.

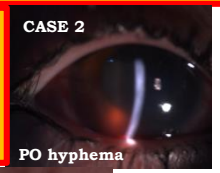


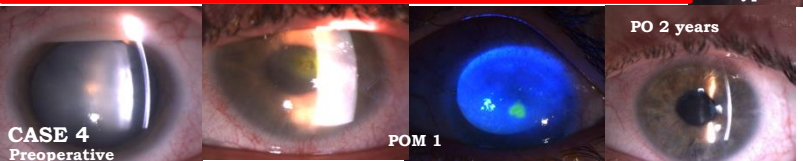
180 to 210-degree GATT was done. IOP was 14 mmHg on PO day 1 w/o meds. IOP gradually rised thereafter. Persistence of high IOP (between 35 and 42 mmHg) occured at PO month 1 on maximally tolerated therapy. After one session of conventional cyclophotocoagulation, IOP was fluctuating between 22 mmHg and 26 mmHg . The patient then lost to F/U in our clinic.

CASE 2

9 year-old male with bilateral PCG. He had received multiple surgeries (Trabeculotomy in OD and trabeculotomy, AGV in OS). He was on maximally tolerated topical medication (OU). VO was 0.1 in OD and LP in OS. IOP was 42 mmHg in OD and 28 mmHg in OS. Both eyes were buphthalmic with mild corneal scarring with WTW measurements 14.5 mm in OD and 14.0 mm in OS. CCT was 592 µm in OD and 610 in OS. Cup/disc ratio was 0.7 in OD and 1.0 OS. GATT was planned in OD.

180-degree GATT could be done. IOP was 52 mmHg with a layered hyphema reaching to inferior pupillary margin on PO day 1. An AC wash-out was done at PO day 5. IOP stabilized between 24 and 29 mmHg with maximally tolerated therapy. IOP rised above 30 mmHg at PO month 2. Tube shunt surgery was considered in this patient.





CASE 3

15 year-old female with bilateral isolated microcornea. No history of ocular intervention and family history of ocular and systemic abnormality. She was on maximally tolerated topical medication in OD. VO was 0.4 in OD and 1.0 in OS. IOP was 35 mmHg in OD and 19 mmHg in OS. She had significantly but apparently normal cornea in OU. Cup/disc ratio was 1.0 in OD and 0.6 in OS. AL was 25.50 mm in OD and 25.22 mm in OS. Autorefractive values were - 4.50 -1.50 x 180° in OD and - 3.75 -1.25 x 60° in OS. Keratomtery readings were 39.94 ; 41.11 in OD and 39.43 ; 39.94 in OS. CCT was 640 µm in OD and 645 µm in OS. WTW measurements were 7.8 mm in OD and 8 mm in OS. Trabecular meshwork was slightly identified nasally on gonoscopy. GATT was planned in OD.

A 60 to 90-degree GATT could be done. IOP was 8 mmHg w/o meds on PO day 1. IOP was stable between 15 and 19 mmHg over a 3-month PO F/U. Patient then lost to F/U and was referred to us 2 years postoperatively. Her IOP was 41 mmHg on maximal treatment. After two sessions of conventional cyclophotocoagulation IOP was measured between 22 and 25 mmHg.

CASE 4

12 year-old male with mild mental retardation due to CP had undergone rhegmatogenous retinal detachment repair + SO tamponade 1.5 years ago followed by SO removal. He was on maximally tolerated therapy in OS. VO was 0.7 in OD and HM in OS. IOP was 16 mmHg in OD and 38 mmHg in OS. AL was 25.16 mm in OD and 25.92 mm in OS. He had intumescent cataract with a ''reverse hypopyon'' appearance in OS. An hypopigmented trabecular meshwork was identified in nasal angle on gonioscopy. Combined surgery (cataract removal + GATT) was planned in OS.

A partial (~60-degree) GATT could be performed. IOP was 9 mmHg w/o meds on PO day 1. IOP gradually rised to 50 mmHg at PO month 1 while receiving topical maximal antiglaucoma treatment. Patient also developed corneal neurotrophic ulcer. 2 weeks following maximal topical and systemic antiglaucoma treatment for high IOP and 50% autologous serum eye drop, preservative free artificial tear and ointments for neurotrophic ulcer, no improvement was observed both in IOP and corneal ulceration. Combined AGV and AMT surgery was planned. IOP was stable (11 mmhg on dorzolamide/timolol fixed combination) with minimal corneal scarring at 2-year F/U.

DISCUSSION

The rate of surgical success after GATT was much higher for patients with PCG. These cases often have clear corneas, less severe buphthalmos and received circumferential compared to partial treatment. Severity of anterior segment changes may result in distal outflow compromise in PCG in the later periods of life which might be a reason of failure after GATT. Case 3 is an unique example of anterior segment dysgenesis. We could only open a limited portion of angle (~60 – 90 degree). Potential Schlemm's canal stenosis, developmental abnormality of proximal and distal outflow structure could also contribute to failure. Schlemm's canal could not also be circumnavigated in Case 4. Tube shunts still remain a viable option in such cases. There are numerous choices for the treatment of paediatric glaucoma. Surgical strategy should be set on an individual basis especially in challenging cases. Potential use of GATT technique should be considered vigilantly in certain circumstances.

References

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