

COMPARISON OF SAFETY AND EFFICACY OF COLLAGEN MATRIX-BASED DEEP SCLERECTOMY AND GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY IN PRIMARY CONGENITAL GLAUCOMA

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INTRODUCTION

Primary congenital glaucoma (PCG) is a type of childhood glaucoma that occurs during the first three years of life. Abnormalities of the trabecular meshwork lead to an elevated intraocular pressure (IOP) through impaired aqueous humor drainage. In PCG, there are no other systemic or ocular anomalies. The primary goal of treatment is to lower the IOP to stop the progression of visual complications namely glaucomatous optic atrophy as well as corneal scarring. PCG is almost always managed surgically.

Surgical: The approach is chosen according to corneal clarity. The aim of surgery is to remove the impedance to aqueous humor out flux caused by the structural anomalies in the angle of the anterior chamber. This aim is attainable through an internal approach (goniotomy) if the cornea is clear enough to permit visualization or an external approach (trabeculotomy or trabeculectomy). This study will delve into the depths of two commonly performed procedures: gonioscopy assisted transluminal trabeculotomy and deep sclerectomy with or without trabeculotomies.

AIM OF THE WORK

The aim of this study was to compare the one year safety and efficacy of deep sclerectomy and GATT to treat primary congenital glaucoma.

PATIENTS AND METHODS

The study was conducted as a retrospective chart review, on 66 eyes (20 GATT, 46 Deep Sclerectomy).

Records of patients who underwent GATT or deep sclerectomy at the pediatric ophthalmology services of Alexandria Main University Hospital, and completed one year of follow up, at the outpatient service, were evaluated

Inclusion criteria:

Children diagnosed with primary congenital glaucoma.
Aged 3 years or less at the time of surgery.

Exclusion criteria:

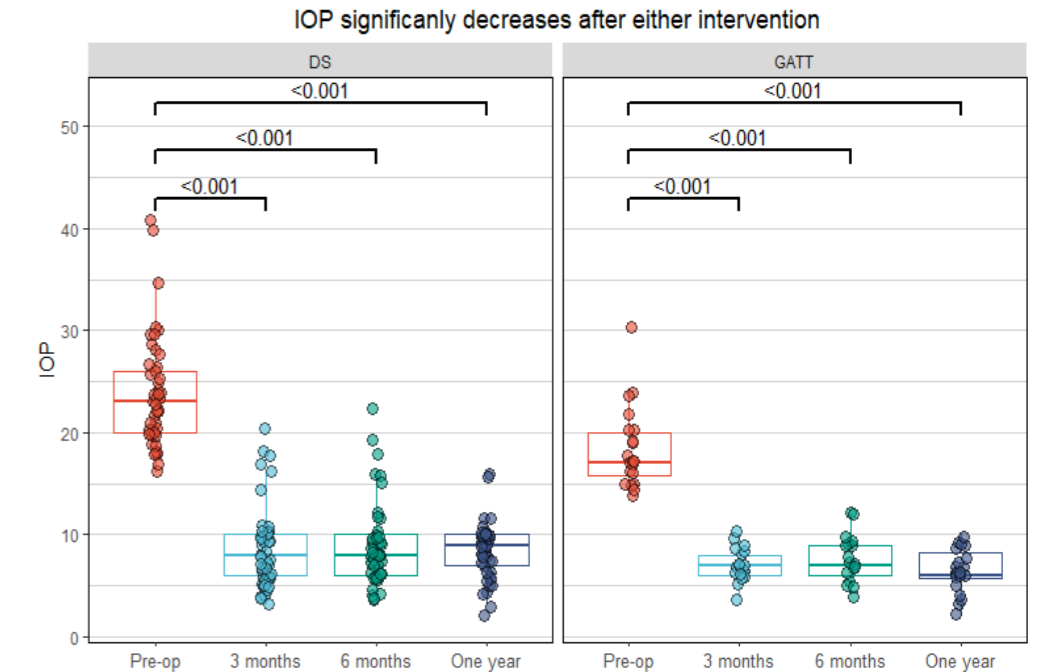
Ocular pathology other than PCG.
Patients lost to follow up and did not complete the one year follow up. .
Patients' records were evaluated for full ophthalmic examination under general anesthesia including IOP recorded using Perkins handheld applanation tonometer, corneal diameter, axial length using A-scan ultrasound.
Patients' records were reviewed for complications such as notes of early bleb leakage, wound cheese-wiring, exposed scleral flaps as well as late complications such as bleb encapsulation, development of cataract, failure of procedure and IOP rise, overfiltration and atrophgia, choroidal detachment and retinal detachment

RESULTS

The mean overall IOP drop was 14.4 mmHg, with DS achieving a statistically more significant drop (mean IOP change was -15.7 mmHg) compared to GATT (mean IOP change was -12 mmHg) (p value = 0. 0087). The mean CD ratio change was -0. 2, with GATT achieving a significantly greater reduction in CD ratio (-0. 3) compared to DS (-0. 1). (p value = 0. 0180).

Table (1): Comparison between GATT and Deep Sclerectomy Outcomes 12 months postoperatively

Term	Overall N (%)	GATT N (%) (n=20)	DS N (%) (n=46)	p-value
Status one year				
1. Absolute success	52 (78.79)	20 (100)	32 (69.6)	0.021*
2. Relative success	3 (4.55)	0 (0)	3 (6.5)	
3. Failure	11 (16.67)	0 (0)	11 (23.9)	
IOP group one year				
>12	11 (16.67)	0 (0)	11 (23.9)	0.042*
12 or less	55 (83.33)	20 (100)	35 (76.1)	
$\alpha = 0.05$. $p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$				
P-values obtained from Pearson's chi-square test of independence				
Term	Overall	GATT	DS	p-value
IOP change	Avg (SD) -14.4 (5.5)	-12 (4.3)	-15.7 (5.8)	t: 0.0087**
CD ratio change	Avg (SD) -0.2 (0.2)	-0.3 (0.3)	-0.1 (0.1)	t: 0.0180*
IOP one year	Avg (SD) 7.6 (2.4)	6.4 (2.2)	8.2 (2.3)	t: 0.0066**
CD ratio one year	Avg (SD) 0.4 (0.3)	0.2 (0.2)	0.5 (0.2)	t: <0.001***
Corneal diameter (mm) one year	Avg (SD) 14.4 (1.8)	13.2 (1.5)	14.7 (1.9)	t: 0.0297*
A-length (mm) one year	Avg (SD) 22.5 (1)	22.3 (1)	22.9 (0.8)	t: 0.0267*
Spherical equivalent one year	Avg (SD) -2.7 (2.7)	-1.9 (2.8)	-3.2 (2.6)	t: 0.1720
$\alpha = 0.05$. $p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$				
P-values obtained from two-sample t-test (t) or Mann-Whitney test (U)				



CONCLUSION

PCG should be managed surgically and the choice of surgery depends on the presence or absence of corneal clarity. GATT depends on the visualization of angle structures through a clear cornea. Wherever possible, GATT is attempted as it reliably and safely lowers IOP. Deep sclerectomy can be performed in the presence of corneal edema, resulting in significant IOP reduction. The procedure is associated with greater IOP reduction and is both effective and safe when used to halt the progress of primary congenital glaucoma. It is, however, also linked to higher rates of re-intervention.