

Outcome and Efficacy of Goniotomy with Kahook Dual Blade in the Management of Primary Open Angle Glaucoma: A Retrospective Interventional Case Series

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Background: The juxtacanalicular part of the trabecular meshwork is known as the site of greatest resistance to aqueous outflow.¹ Goniotomy using Kahook Dual Blade (KDB) is one of the minimally invasive surgical methods used in removing perceived trabecular obstruction and

Table 1: Demographic and clinical characteristics of the patients

Characteristics	Type of surgery	
	KDB	Phaco + KDB
Age (years)		
Mean±SD	68.0±8.83	64.5±8.23
Range	63-77	54-82
Gender		
Male	2(22.2%)	3 (33.3%)
Female	1 (11.1%)	3 (33.3%)
Eye		
Right	3 (25%)	4(33.3%)
Left	1 (8.3%)	4 (33.3%)
Glaucoma severity		
Mild	2	0
Moderate	1	2
Severe	1	6

Table 2: Intraocular pressure at baseline and follow-up for all eyes, eyes post KDB+Phaco, and eyes that had standalone KDB goniotomy

Characteristic	value
All	
Mean follow-up(months)	10±1.95
Mean IOP preoperative (mmHg)	18.58 ± 5.42
mean IOP Postoperative	13.0 ±5.70
IOP reduction (n, %)	5.5 (30.0)
t-test (p-value)	2.46 (0.02)*
KDB + PHACO	
Mean follow-up	9.38±1.92
Mean IOP preoperative	17.0 ± 4.93
Mean IOP postoperative	11.88 ± 3.94
IOP reduction	5.12 (30.1)
t-test (p-value)	2.30 (0.04)*
KDB standalone	
Mean follow-up	11.25±1.5
Mean IOP preoperative	21.75 ± 5.56
Mean IOP postoperative	15.25 ± 8.54
IOP reduction	6.5 (29.9)
t-test	1.28 (0.249)

*Statistically significant ($p < 0.05$)

thereby enhancing the conventional outflow pathway.^{2,3} The objective of this study was to describe the efficacy and safety of goniotomy with trabecular meshwork excision using the Kahook Dual Blade (KDB, New World Medical Inc., Rancho Cucamonga, CA) in patients with Primary Open Angle Glaucoma, (POAG).

Patients and Methods: This was a retrospective analysis of data collected from medical records of adult patients with primary open angle glaucoma of varying severity who had goniotomy with KDB either as a standalone procedure or with phacoemulsification at Eye Foundation Hospital, Ikeja Lagos Nigeria, from April 2017 to July 2018. The procedures carried out in this study followed the ethical standards of the hospital and the tenets of the Helsinki Declaration. Informed consent for the study was taken from every individual in the study.

Data retrieved and assessed were age, gender, laterality, types and severity of glaucoma, type of surgery, any new adverse events, and any secondary surgical interventions for IOP control. Data of patients with at least 6 months of follow-up was included in the analysis. The primary efficacy outcome measure was a $\geq 20\%$ reduction in intraocular pressure (IOP) from baseline. The secondary outcome measure was IOP-lowering medical regimen reduced by ≥ 1 medication compared with preoperative therapy.

Results: A total of 12 eyes of 9 patients were included in the study. The mean age of the patients was 66.4 ± 8.8 years. Eight eyes had goniotomy

Table 3: Number of topical antiglaucoma medications at baseline and follow-up period

Type of Surgery	Topical medication		t-test (p-value)	Number in Reduction	Conclusion
	Preop Mean \pm SD	Postop Mean \pm SD			
Kahook alone	2.25 \pm 0.957	1.75 \pm 1.26	0.63 (0.550)	0.5	No significant decrease
Kahook+Phaco	2.50 \pm 0.93	0.63 \pm 0.74	4.47 (0.001)*	1.87	Significant decrease
All	2.42 \pm 0.90	1.0 \pm 1.04	3.56 (0.001)*	1.42	Significant decrease

*Statistically significant ($p < 0.05$)

Table 4: Proportion of eyes with $\geq 20\%$ reduction in intraocular pressure

Type of Surgery	$\geq 20\%$ drop in IOP from Pre to Post		Total	Fisher's Exact
	Yes Freq (%)	No Freq (%)		
Kahook alone	3 (30.0)	1 (50.0)	4 (33.33)	1.00 ^u
Kahook+Phaco	7 (70.0)	1 (50.0)	8 (66.67)	
All (Total)	10	2	12	

with KDB plus phacoemulsification with posterior intraocular lens implantation while 4 eyes had goniotomy with KDB alone. Majority of the eyes (7, 58.3%) had severe Primary Open Angle Glaucoma (POAG). See Table 1. After a mean follow-up period of 10 ± 1.95 months, the baseline mean intraocular pressure (IOP) reduced by 5.58mmHg (30%) from 18.58 ± 5.42 mmHg to 13.0 ± 5.70 mmHg which is statistically significant ($p < 0.005$). See table 2.

The number of topical antiglaucoma medications showed a decline of all eyes and Phaco +KDB only (table 3). Ten eyes (83.3%) achieved primary objective of reduction in intraocular pressure from baseline as shown in table 4.

Complications included transient hyphaema in two (16.7%) eyes. None of the eyes had any additional surgical intervention to reduce the IOP.

Discussion: Kahook Dual Blade only recently became a tool for anterior chamber angle surgery.²

⁵ In our series, the success rate was better when goniotomy with Kahook Dual Blade was combined with phacoemulsification (87.5%) than when used as a standalone procedure (75%). This finding is comparable to the success rate of 71.8% for

KDB+Phaco and 68.8% for KDB alone respectively reported by Sieck EG *et al*⁴.

Conclusion: Goniotomy with Kahook Dual Blade either as a standalone procedure or with phacoemulsification achieved greater than 20% reduction in intraocular pressure in these series with transient postoperative hyphaema occurring in two eyes.

References

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