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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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ISTENT INJECT W AND KAHOOK DUAL BLADE FOR TREATING MILD-TO-MODERATE GLAUCOMA

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Abstract.

Background: This is a review article to contrast the lowering effect of intraocular pressure of two minimally invasive glaucoma surgery (MIGS) devices namely iStent inject (the second edition) versus excisional goniotomy using Kahook dual blade (KDB) as a combo procedure with cataract surgery, as well as post-operative best corrected visual acuity BCVA loss for those with mild to moderate primary open-angle glaucoma. Design: a review article comparing two MIGS devices. **Method:** randomization of patients into two categories, one-hundred procedures for iStent injection and the other one hundred for Kahook Dual Blade (KDB). Intraocular pressure (IOP), BCVA, and adverse events were recorded. The fundamental results were the IOP, the post-operative visual acuity and refractive errors. **Results:** one-hundred operations for each procedure were evaluated and the BCVA loss by two rows or more one year post-operatively. Each procedure seems to have the same safety profile and the same effect on visual acuity (P=0.11). **Conclusion:** each device reduces the IOP as well as lowers the reliance on topical hypotensive medications and safety profile for visual acuity post-operatively. The limitation of this review is a relatively small sample size. Additionally, the one-year follow-up time does not present a clue on long-term results in such chronic ocular illness.

Key words. Minimally invasive glaucoma surgery, istent, glaucoma, eye surgery, kahook dual blade.

Introduction.

Glaucoma is the primary source of incurable loss of vision globally, the prevalence is going to be on the rise as the population becomes older [1]. Currently, the primary treatment lines could comprise topical anti-glaucoma medications, laser intervention, and/or filtration surgery. The initial strategy for treatment for the early stage of "open-angle glaucoma" is topical eye drops. These drops have an overall favourable safety profile; however, it relies on the patient's adherence and obedience, which is in most situations known to be the law. In addition, these topical medications are renowned for being toxic to the ocular surface due to preservatives. Finally, the added monthly cost burdens the patient's financial situation.

As a substitute for the primary modality of treatment in certain scenarios or as a choice for those for whom medication use is contraindicated, laser trabeculoplasty could be utilized, nevertheless, many studies [2-4] have recorded that the rewarding result of laser therapy might fade as the time goes by. For patients with more advanced and /or stubborn glaucoma, traditional filtration surgery such as "trabeculectomy" and " shunt implant" would be the methodology of choice. Nevertheless, the long-lasting success of these procedures and postoperative related complications such as "endophthalmitis, hypotony, bleb infections, bleb leaks, or fibrosis" [5-7], remains the main issue for those with glaucoma and the treating ophthalmologist. The additive jeopardy of many complications builds up as time goes by, rendering the long-term reliability more suitable given the expectation of life and the total glaucoma prevalence [1].

In the last decade, the glaucoma treatment podium has witnessed the pioneering of micro-invasive glaucoma surgery procedures. MIGS induces more moderate IOP and medication limitations and lowers the rates of serious complications; therefore, it is considered the most appropriate for those with mild-to-moderate glaucoma. This report aims to describe two currently used MIGS procedures, their effects on IOP both as stand-alone surgeries and when incorporated with phacoemulsification, and postoperative visual results for mild to moderate glaucoma.

Trabecular micro bypass.

The evolution and development of "Micro-Invasive Glaucoma Surgery (MIGS)" has introduced fresh and impressive growth to the treatment of glaucoma platform. It is customarily utilized for patients with mild-to-moderate open-angle glaucoma who planned or scheduled for phacoemulsification surgery, MIGS, in comparison with more aggressive glaucoma surgeries with high complication rates and the possibility of extended postoperative convalescence, is characterized by being efficacious, of lower surgical trauma, reliable unharmed characterization, and with rapid recovery. It can re-institute the eye's natural outflow to lower "intraocular pressure (IOP)" [8,9].

A multitude of MIGS procedures have been published in the literature; this review would discuss two of these modalities: "(iStent, Glaukos, Inc.)", and excision of a strip of trabecular meshwork with the "Khaook Dual Blade (KDB) (New World Medical, Inc.)". Each one uses a dissimilar methodology bypassing trabecular meshwork.

Regarding the former, it is inserted through "trabecular meshwork" in a way that the proximal end sticks out into the anterior chamber, while the distal end stayed in the "canal of Schlemm" [10]. removing a ribbon of trabecular meshwork over multiple clock hours can make a world of difference in treating Glaucoma. By doing this, we're essentially opening up a wider pathway for communication between the anterior chamber and the post-trabecular meshwork distal outflow system. This procedure is known as KDB and it's suitable for all types of Glaucoma, regardless of severity. On the other hand, iStent is designed specifically for early-stage (mild to moderate) Glaucoma cases [11-16].

iStent inject W (second generation) Placement with phacoemulsification cataract surgery:

The iStent inject is one of the most miniature medical implants ever known, and it is measured 360 microns in depth and width.

The iStent device is shaped like an arrow and designed to be inserted through the wall of trabecular meshwork with the head residing in "Schlemm's canal". Its central lumen is 80 microns in diameter enabling the aqueous move from the anterior chamber to "Schlemm's canal", where it exists through four 50 microns side flow outlets so that it allows multidirectional aqueous outflow, bypassing the trabecular meshwork- the primary stumbling block to fluid drainage in open-angle glaucoma- (Figure 1) [17]. The iStent inject is composed of nonferromagnetic titanium and is "heparin-coated" to promote flow. Two stents are preloaded into a disposable injector, allowing insertion for two or three clock hours during the phacoemulsification procedure. The iStent injection was CE marked in 2010 and FDA-approved in 2018. The motif of the configuration of the stent is to restore physiological aqueous outflow directly to the Schlemm's canal [18].

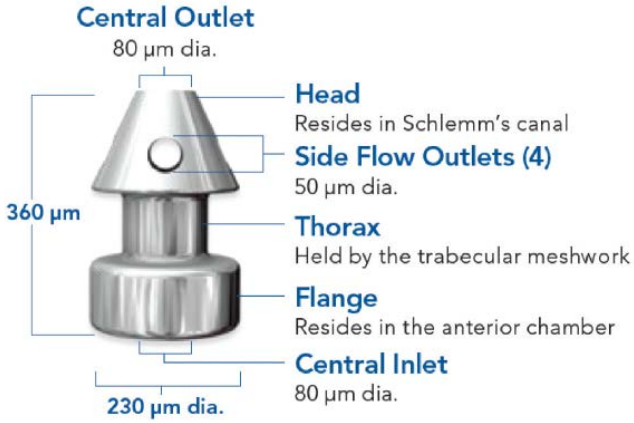

Figure 1. *iStent design and dimensions [17].*

Whether combined with cataract surgery or implanted alone, studies show that the second-generation iStent devices significantly reduce intraocular pressure (IOP)18 and the sum of eye drops required to bring IOP under control. In many cases, the entire elimination of topical medication needs has been achieved by trabecular bypass iStent [19].

Trabecular micro-bypass stenting may also reduce diurnal IOP variation, which may minimize the risk of progression [20]. Meanwhile, physiological episcleral backpressure may mitigate the risk of hypotony seen in more invasive glaucoma procedures, including transscleral devices [20,21].

The iStent inject W is a straightforward surgical intervention, and it is implanted either as a stand-alone glaucoma surgery or incorporated with a phacoemulsification procedure. The postoperative visual results after combined cataract and trabecular micro-bypass procedures are similar to stand-alone cataract procedures [22].

The use of iStent inject W has been shown in many studies to consistently and reliably reduce mean IOP while reducing medication burden [18,19] it is considered a safe procedure that does not affect visual outcomes or recovery when combined with cataract surgery and as it spares the conjunctiva, which leaves doors open if the patient requires more invasive glaucoma procedures in the future.

Adding iStent injection does not affect visual outcomes. For example, a study comparing 76 combined surgeries with 50 cataract-only surgeries found no significant difference in the percentage of the eyes within 0.25, 0.5, or 1.0 diopter of the refractive target [23].

The expenses of iStent injection are balanced by lowering the medication price burden, lowering the frequency of requiring further surgeries, lower transportation, and disability costs. From a financial point of view, it is considered an attractive choice for French people with mild-to-moderate open-angle glaucoma" the study concluded [24].

One European, prospective, and multicenter (Synergy) trial, which followed nearly a hundred patients known to have open-angle glaucoma who had taken at least two topical anti-glaucoma eye drops underwent implantation of two devices of iStent as a stand-alone surgery and were followed for one year [25]. four-fifth of patients had stable postoperative CDVA of 20/40 after one year.

The outcome, whether stand-alone or combined with phacoemulsification, the data from many studies support the safety of iStent injection. In addition, the obtainable records strengthen the capacity of iStent insertion in keeping superb visual acuity while reducing the IOP and the burden of using topical medication in those who have cataracts.

The average intraocular pressure and being less reliant on antiglaucoma topical medications with iStent-phaco in its pivotal trial were eight per cent (from baseline) with eighty-seven percent diminution in topical treatment use at one year. By the second year, the intraocular pressure lowering result stayed constant. The iStent in its second generation brings about an average intraocular pressure diminution of two to ten percent from the baseline and seventy-five to eighty percent in medication within six to twenty-four months of a postoperative visit when done with phacoemulsification as a combo procedure [26,27].

Figure 2. *Kahook Dual Blade. [https://eyewiki.org/Kahook_Dual_Blade:_Ab_Interno_Trabeculectomy].*

Khaook dual Blade and gonioscopy-assisted transluminal trabeculectomy:

The Khaook Dual blade (KDB) (new World Medical Inc.) (Figure 2) [28], excises the whole medial portion of "the trabecular meshwork" as well as the inner block of the "Schlemm′s canal". Goniotomy is done with this kind of blade, and it is a minimally invasive surgical choice for those with mild to moderate glaucoma. The wall of the sclera dose not infringed by surgical operation, so it is unaccompanied with a bleb formation and the subsequent potential bleb-related complications. By excising the diseased trabecular tissue, the KDB gives an aqueous straightforward entrance to the collector channels, bypassing malfunctioned trabecular meshwork and the distal outflow system. In spite of the fact that goniotomy performed with the KDB, is similar to the procedure performed with the Trabectome (Neo Medix), the KDB does not necessitate a cash investment; the expenses are confined to that of the blade and a goniolens, resulting in a much lower price per patient with the KDB compared with the Trabectome [28].

Presumably, the KDB goniotomy procedure as a stand-alone or incorporated with a phacoemulsification procedure can attain favourable postoperative outcomes. In addition, KDB has a decently lower financial worry on those planned for MIGS than other implantable MIGS operative modalities; therefore, it is a favourable option for mild-to-moderate glaucoma [29].

The retrospective analysis of a hundred patients has revealed some fascinating results. Surprisingly, more than a quarter of glaucoma cases in the phaco-KDB group had refractive errors greater than 0.5 D, while one-third of cases in the phacoemulsification category developed refractive errors [29]. Although it's worth noting that the difference was not statistically significant (P=0.11), it's still an exciting discovery. In light of these findings, Dr Hirabayashi's clinical case proposes a groundbreaking solution. According to his research, using phaco-KDB may significantly reduce refractive errors following glaucoma treatment [30]. This method promises better vision for patients compared to conventional filtration surgery and other MIGS surgical approaches. Imagine the possibilities of a world where patients no longer have to suffer from impaired vision due to refractive errors after glaucoma treatment [31].

In a groundbreaking study, Dorairaj et al. [32], compared the outcomes of two different surgical techniques for treating cataracts. The first group underwent Khaook blade and phacoemulsification, while the second group received a combined iStent and phacoemulsification treatment. After just six months of post-surgical check-ups, both groups saw significant improvements in their mean CDVA. What's more, there was no notable difference in CDVA between the two groups of patients. In another study by Sieck et al. [29], visual results were compared between Khaook blade and phacoemulsification, as well as phacoemulsification on its own. The findings were astounding - refractive errors of more than ± 0.5 D occurred in a quarter of eyes in the phaco-KDB category, compared to two-thirds in the phacoemulsification category. This study sheds new light on the effectiveness of different surgical techniques and highlights the importance of choosing the right one for each patient.

In a recent study, Dorairaj et al. [32], compared two groups of patients who underwent different treatments for their eye condition. The first group received the traditional Khaook blade and phacoemulsification while the second group underwent a newer procedure combining iStent and phacoemulsification. After just six months of follow-up, both groups showed significant improvement in their visual acuity, with no notable difference between the two groups. Meanwhile, Sieck et al. conducted a separate study comparing the outcomes of KDB with phacoemulsification and phacoemulsification alone [29]. Interestingly, they found that more than a quarter of eyes in the phaco-KDB group had refractive errors of more than ±0.5 D, compared to two-thirds of eyes in the phacoemulsification-only group. These results suggest that the combination of KDB and phacoemulsification may be a better option for some patients (p=0.11).

The KDB-phaco intervention lowers the intraocular pressure by nearly twenty five percent and reliance on topical treatment by around forty-five to sixty -five percent one year after surgery [12,32,33]. In terms of complications of these MIGS procedures, a prospective randomized clinical trial in eyes with mild to moderate open-angle glaucoma was examining these sorts of unwanted effects: the intraocular pressure elevation was by far the most common undesirable result, occurred in 31.7 percent and 33 percent in KDB-phaco and iStent-phaco in the follow-up visit, respectively. Happily, such elevation typically resolves on its own. Posterior capsular opacification was found in 8.5 percent of KDB-phaco and 6 percent in iStent-phaco. Blood reflux into the anterior chamber during the procedure and on day one postoperatively is an anticipated incident in angle-based surgery and was not counted as a complication. However, the blood remaining in the anterior chamber for more than a week was considered a complication (hyphema) and it was reported in 3.7 percent in the former procedure and only 1.2 percent for the latter one. Only one eye in both categories shows a cyclodialysis cleft [34].

The significance of MIGS.

1. It is recognized that phacoemulsification procedure as a stand-alone surgery lowers the mean intraocular pressure in patients with primary open-angle glaucoma. Research suggests the outcome remains for five years or more [35]. However, the piled-up information indicated that the IOP-lowering effect of cataract surgery alone is doubtful and usually inadequate to reduce reliance on topical eye drops that control IOP. For example, a recent retrospective analysis by prof Baudouin and colleagues of 70 eyes of POAG patients undergoing phacoemulsification cataract surgery found an average intraocular pressure reduction of 6%. The intraocular pressure reduction ranged from 1 mmHg to 8 mmHg was unpredictable. In approximately 1 out of 5 cases, patients experienced an increase in intraocular pressure (IOP) after their surgery, with over 12% of cases seeing IOP levels surpassing 30 mm Hg. Fortunately, there is a less invasive option available - utilizing the iStent in conjunction with cataract surgery. This alternative has shown promising results and is worth considering as an effective and efficient option for patients [36].

2. Due to the popularity of the daily use of topical anti-glaucoma eye drops, ocular surface toxicity is a common comorbidity in a patient with glaucoma. Monotherapy may be satisfactory; however, many patients require two or even three topical medications to achieve target IOP. Studies have shown a significant prevalence of ocular surface disease among those suffering from glaucoma. The more the number of topical drops used, the more the symptoms of toxicity are deemed to occur. The addition of topical medication may adversely affect its efficacy, thus compelling patients and physicians to probe the cost-and-benefit ratio of adding more topical medications to patients ′s disease management. Trabecular micro-bypass surgery escorts cataract patients' ocular surface with glaucoma and affords a better quality of life for patients.

3. One must signal that early intervention may help avoid the progression of glaucoma to cause severe visual impairment, including blindness. The consequences of the advanced glaucoma intervention study propose that lowering the pressure inside the eye is accompanied by a better field of vision [37].

When comparing surgical intervention to eye drops for the lowering of IOP, "the collaborative initial glaucoma treatment study" showed that in an eight-year follow-up, those treated surgically had lower IOP levels (15mmHg vs. 18mmHg) presented with similar visual field progression rates [38].

Conclusion.

As the MIGS room expands and more treatment options become available, it is increasingly crucial for surgeons to understand the specification of each device and the guidelines for how to implant them safely and successfully. With proper candidate selection with appropriate techniques, MIGS offers eye care professionals the capability to provide tangible benefits to their patients soon after treatment regarding IOP control and visual outcome. Therefore, it is prudent that we do not waste time observing disease progression; instead, be more prompt in treatment.

Recommendation.

This review highlights the crucial role of gonioscopy in modern glaucoma surgery. It's not just an add-on tool, it's the first step towards mastering minimally invasive glaucoma surgery (MIGS). The review highlights the essential steps of setting up the microscope, tilting the patient's head, and using a surgical gonio lens. Adequate training is key, and attending workshops or wet labs can help you master this procedure.

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