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Research Article

Conventional Trabeculectomy vs. Sutureless Trabeculectomy in Patients with Uncontrolled Glaucoma: Structural and Functional Outcomes

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Abstract

Objective: To evaluate and compare the structural and functional outcomes of conventional and sutureless methods of trabeculectomy at 6-month follow-up.

Methods: Of the patients referred for trabeculectomy, 18 were selected (8 males and 10 females). Patients were randomly divided into two equal groups: conventional surgery and sutureless surgery. Bleb morphologic parameters were measured using anterior segment optical coherence tomography at 6 months follow-up. The obtained data were statistically analyzed by T-test and Chi-square using SPSS software.

Results: The mean postoperative morphological parameters including bleb height, width, and wall thickness were lower in the sutureless group while the difference was not statistically significant. Bleb wall pattern, reflectivity, and vascularity difference between the two groups were also not statistically significant. Furthermore, there was no statistically significant difference in intraocular pressure between the two groups.

Conclusion: No significant difference in bleb morphology parameters and intraocular pressure was observed between the two groups of conventional and sutureless methods at 6 months follow-up. A study with a longer follow-up and a higher statistical population is recommended.

Keywords: *Trabeculectomy; Bleb; ASOCT; Glaucoma*

Introduction

Glaucoma is considered one of the public health problems, and a significant portion of the healthcare budget is allocated to serve this group of patients. Glaucoma is divided into two categories: primary open-angle glaucoma (POAG) and angle-closure glaucoma [1]. In the United States, the initial prevalence of POAG in individuals above 40 years is 1.86% (2.22 million affected), and about a hundred thousand of these patients have experienced bilateral blindness due to the disease [2]. According to WHO estimates, there are approximately 104.5 million people worldwide with elevated intraocular pressure (IOP), with 2.4 million new cases of POAG occurring annually. The overall global prevalence of glaucoma-related blindness is 8 million, with 4 million cases attributed to POAG [3]. Glaucoma is the cause of 12.3% of blindness cases and is the second most common cause after cataracts [4,5]. Currently, the most common surgical procedure for treating cases resistant to medical treatment of POAG and some angle-closure cases is trabeculectomy [6]. This procedure involves creating a shunt

from the anterior chamber of the eye through the sclera to the subconjunctival space, allowing aqueous humor to move outside the globe, thus controlling intraocular pressure and forming a bleb [7]. Trabeculectomy can be performed using two methods: conventional and sutureless, both of which are being compared in terms of efficacy [8].

The success of trabeculectomy is influenced by factors such as the morphology of the created bleb, typically assessed through clinical examination with a slit lamp [9]. This is a descriptive-analytical study on patients with uncontrolled glaucoma who underwent trabeculectomy surgery using the sutureless or conventional methods.

Aim of the Study

To investigate the bleb morphology in evaluating the success of trabeculectomy using conventional and sutureless methods, utilizing Anterior Segment Optical Coherence Tomography, in patients referred to Zahedan Al-Zahra Hospital in the year 2022.

Methods

The study was conducted over a 6-month period, during which 19 patients who had undergone surgery at Alzahra Eye Clinic were included. One patient was excluded from the study due to a lack of follow-up visits after the operation, leaving 18 patients for analysis.

Inclusion and exclusion criteria

The inclusion criteria for entering the study were patients with glaucoma who had undergone trabeculectomy surgery due to a lack of response to medical treatment for controlling intraocular pressure.

The exclusion criteria for leaving the study included a history of other eye surgeries, inflammation of the eye, secondary glaucoma, non-compliance with follow-up visits, and poor-quality ASOCT images.

Sample size

The sample size was calculated based on the results obtained from a previous study [10] and a pilot study. Considering the maximum value (related to height) to calculate the final sample size, 6 patients in each group, and a total of 12 patients were taken into account. Considering an attrition rate of 30% to improve the study power, the final sample size was calculated to be 9 in each group and a total of 18 patients.

Sampling method

The sampling method used was consecutive sampling, where patients with glaucoma who met the inclusion criteria and underwent trabeculectomy surgery were assigned to either the sutureless or conventional treatment group based on the type of surgery performed. Patients were separated into blocks of three, and 9 patients from each group were selected for the study. Patients with exclusion criteria were excluded from the study, and follow-up and post-operative medical treatment were performed routinely and similarly in both groups.

Data collection and analysis

Collected data included details about patient demographics, pre-operative data, and post-operative follow-up data. The data were collected during follow-up visits at one day, one week, one month, and six months after the surgery. ASOCT images were taken from the patients' blebs during follow-up visits, and relevant information was extracted and recorded in the information form. The collected data were then subjected to statistical analysis.

The data analysis and description method in this study involved inputting the recorded data into SPSS software version 22.0. After appropriate labeling, the data were analyzed using appropriate statistical tests corresponding to the type of each variable under

investigation. Quantitative data were reported in the form of means and standard deviations, while qualitative data were presented as frequencies and relative frequencies.

The distribution of quantitative data was examined using the Independent-Sample T-Test. If the distribution was found to be non-normal, the relationship between these variables and qualitative variables was investigated using the independent-sample Mann-Whitney U test. Additionally, the Chi-Square/Fisher's exact test was used to compare qualitative variables in each follow-up.

The changes in quantitative variables between the two treatment groups were compared using the repeated measures test. A p-value of less than 0.05 was considered statistically significant.

Ethics

Ethical considerations were taken into account, and informed consent forms were obtained from all patients. The participants were fully informed about the research's purpose and execution methods. Participation in the study involved no additional costs beyond the necessary treatment and evaluations for the patients.

Furthermore, the study was designed in accordance with the general ethical guidelines for research involving human subjects (Codes 1, 2, 3, 4, 5, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25, 26, 27, 28, 29, 30, and 31) as approved by the regional ethics committees for medical research. The study also adhered to the guidelines provided in the general ethics guidebook for research on human members and tissues in the Islamic Republic of Iran, codes 1, 2, 3, 5, 6, 7, and 8.

Results

Descriptive and demographic analysis

The study results were based on data collected over a 6-month period, during which information from 19 surgically treated patients at Al-Zahra Eye Clinic was included in the study. However, one patient was excluded from the study due to a lack of postoperative follow-up visits, leaving a total of 18 patients for analysis.

The overall mean age of the patients was 49 years with a standard deviation of 23.45. The youngest patient was 3 years old, and the oldest was 87 years.

Among the 18 patients included in the study, 8 patients were male (44.4%), and 10 patients were female (55.6%).

Comparison of patient's gender

Out of the 18 patients included in the study, 10 were female (55.6%), and 8 were male (44.4%). In the sutureless populations we had 5 males and 4 females. In the conventional group we had 3 males and 6 females. To compare the distribution of gender in the two treatment groups, a chi-square test was used. According to the Pearson chi-square test with df = 1 and a p-value of 0.343, there was no statistically significant difference in gender distribution between the two treatment groups. This indicates that gender did not have a significant impact on the choice of treatment in this study.

Age of patients

The average age of patients in group A (conventional) was 24.31 ± 50.67 years, with the youngest patient being 7 years old and the oldest being 87 years old. In group B (sutureless), the average age of patients was 23.91 ± 47.33 years, with the youngest patient being 3

years old and the oldest being 81 years old. In the conducted analysis, age in both groups followed a normal distribution. For comparing the distribution of age in the two treatment groups, an independent t-test was used. Prior to conducting the t-test, the assumption of equal variances was checked using the Levene's test, and it was confirmed with a p-value of 0.932. Subsequently, the independent t-test was performed, and based on the p-value of 0.773, there was no statistically significant difference in age between the two treatment groups.

Comparison of the bleb height in the two study groups

First follow-up

In the first follow-up, the mean bleb height was 1538 micrometers with a standard deviation of 374 micrometers in the conventional group, and 1403 micrometers with a standard deviation of 428 micrometers in the sutureless group. To assess the relationship between bleb height and treatment group, an independent t-test was used. Initially, the Leven's test was performed to test the assumption of equal variances, and with a p-value of 0.69, the assumption of equal variances was confirmed. Subsequently, based on the independent t-test and a p-value of 0.485, no significant difference in bleb height was observed between the two groups.

Second follow-up

In the second follow-up, the mean bleb height was 1570 micrometers with a standard deviation of 366 micrometers in the conventional group, and 1353 micrometers with a standard deviation of 414 micrometers in the sutureless group. Similar to the first follow-up, the independent t-test was used to assess the relationship between bleb height and treatment group. The Leven's test with a p-value of 0.566 confirmed equal variances. The independent t-test with a p-value of 0.258 indicated no significant difference in bleb height between the two groups.

Third follow-up

In the third follow-up, the mean bleb height was 1553 micrometers with a standard deviation of 364 micrometers in the conventional group, and 1431 micrometers with a standard deviation of 358 micrometers in the sutureless group. The independent t-test with a p-value of 0.484 showed no significant difference in bleb height between the two groups, confirming equal variances based on the Leven's test with a p-value of 0.687.

Forth follow-up

In the fourth follow-up, the mean bleb height was 1556 micrometers with a standard deviation of 351 micrometers in the conventional group, and 1446 micrometers with a standard deviation of 372 micrometers in the sutureless group. Similarly, the independent t-test with a p-value of 0.528 revealed no significant difference in bleb height between the two groups, confirming equal variances based on the Leven's test with a p-value of 0.899.

Repeated measures analysis

The Mauchly's test was not significant. According to the Greenhouse-Geisser test with a p-value of 0.98, there was no significant change in the mean bleb height over the follow-up periods within each group. The overall Between-Subjects Effects test with a p-value of 0.08 showed no significant difference in the mean bleb height across all follow-ups between the two study groups.

Comparison of the bleb width in the two study groups

First follow-up

In the first follow-up, the mean bleb width was 4505 micrometers with a standard deviation of 1124 micrometers in the conventional group, and 4005 micrometers with a standard deviation of 1288 micrometers in the sutureless group. To assess the relationship between bleb width and treatment group, an independent t-test was used. The Leven's test with a p-value of 0.50 confirmed equal variances.

Subsequently, based on the independent t-test and a p-value of 0.393, no significant difference in bleb width was observed between the two groups.

Second follow-up

In the second follow-up, the mean bleb width was 3871 micrometers with a standard deviation of 1104 micrometers in the conventional group, and 3934 micrometers with a standard deviation of 1096 micrometers in the sutureless group. Similar to the first follow-up, the independent t-test with a p-value of 0.999 confirmed equal variances. The independent t-test with a p-value of 0.904 indicated no significant difference in bleb width between the two groups.

Third follow-up

In the third follow-up, the mean bleb width was 4561 micrometers with a standard deviation of 880 micrometers in the conventional group, and 3862 micrometers with a standard deviation of 1312 micrometers in the sutureless group. The independent t-test with a p-value of 0.219 confirmed equal variances. The independent t-test with a p-value of 0.293 showed no significant difference in bleb width between the two groups.

Fourth follow-up

In the fourth follow-up, the mean bleb width was 4467 micrometers with a standard deviation of 1102 micrometers in the conventional group, and 4153 micrometers with a standard deviation of 1263 micrometers in the sutureless group. Similarly, the independent t-test with a p-value of 0.558 confirmed equal variances. The independent t-test with a p-value of 0.582 indicated no significant difference in bleb width between the two groups.

Repeated measures analysis

The Mauchly's test was not significant. According to the Greenhouse-Geisser test with a p-value of 0.185, there was no significant change in the mean bleb width over the follow-up periods within each group. The overall Between-Subjects Effects test with a p-value of 0.766 showed no significant difference in the mean bleb width across all follow-ups between the two study groups.

Comparison of the thickness of the bulb wall in two study groups

First follow-up

In the first follow-up, the average thickness of the bulb wall in the conventional group was 735 micrometers, with a standard deviation of 267 micrometers, and in the sutureless group, it was 710 micrometers with a standard deviation of 266 micrometers. To investigate the relationship between the thickness of the bulb wall and the treatment group, an independent t-test was used. Initially, to examine the assumption of equal variances, the Levene's test was performed, and since the p-value was 0.852, the assumption of equal variances was confirmed. Furthermore, according to the independent t-test with a p-value of 0.842, there was no significant difference in bulb wall thickness between the two groups.

Second follow-up

In the second follow-up, the average thickness of the bulb wall in the conventional group was 685 micrometers, with a standard deviation of 234 micrometers, and in the sutureless group, it was 703 micrometers with a standard deviation of 197 micrometers. To investigate the relationship between the thickness of the bulb wall and the treatment group, an independent t-test was used. Initially, to examine the assumption of equal variances, the Levene's test was performed, and since the p-value was 0.575, the assumption of equal variances was confirmed. Furthermore, according to the independent t-test with a p-value of 0.864, there was no significant difference in bulb wall thickness between the two groups.

Third follow-up

In the third follow-up, the average thickness of the bulb wall in the conventional group was 596 micrometers, with a standard deviation of 161 micrometers, and in the sutureless group, it was 562 micrometers with a standard deviation of 152 micrometers. To investigate the relationship between the thickness of the bulb wall and the treatment group, an independent t-test was used. Initially, to examine the assumption of equal variances, the Levene's test was performed, and since the p-value was 0.922, the assumption of equal variances was confirmed. Furthermore, according to the independent t-test with a p-value of 0.648, there was no significant difference in bulb wall thickness between the two groups.

Fourth follow-up

In the fourth follow-up, the average thickness of the bulb wall in the conventional group was 650 micrometers, with a standard deviation of 262 micrometers, and in the sutureless group, it was 620 micrometers with a standard deviation of 168 micrometers. To investigate the relationship between the thickness of the bulb wall and the treatment group, an independent t-test was used. Initially, to examine the assumption of equal variances, the Levene's test was performed, and since the p-value was 0.169, the assumption of equal variances was confirmed. Furthermore, according to the independent t-test with a p-value of 0.777, there was no significant difference in bulb wall thickness between the two groups.

Repeated measures analysis

In the conducted analysis, the Mauchly's test was not statistically significant.

According to the Greenhouse-Geisser test with a p-value of 0.18, there were no significant differences in the mean bulb wall thickness across the follow-ups.

In the overall between-subjects effects test with a p-value of 0.76, it was observed that the mean bulb wall thickness did not differ significantly between the two groups across all follow-ups.

Comparison of bleb wall vascularity in two study groups

First follow-up

In the first follow-up, in the conventional group, bleb wall vascularity was mild in 3 patients (33.3%), moderate in 5 patients (55.5%), and severe in 1 patient (11.1%). In the sutureless group, bleb wall vascularity was mild in 2 patients (22.2%), moderate in 5 patients (55.5%), and severe in 2 patients (22.2%). To assess the relationship between bleb wall vascularity and treatment group, a chi-square test was used. According to the Pearson chi-square test with df = 2 and a p-value of 0.766, there was no statistically significant difference in bleb wall vascularity between the two groups.

Second follow-up

In the second follow-up, in the conventional group, bleb wall vascularity was mild in 4 patients (44.4%), moderate in 4 patients (44.4%), and severe in 1 patient (11.1%). In the sutureless group, bleb wall vascularity was mild in 2 patients (22.2%), moderate in 4 patients (44.4%), and severe in 3 patients (33.3%). Similar to the first follow-up, the chi-square test was used to assess the relationship between bleb wall vascularity and treatment group. According to the Pearson chi-square test with df = 2 and a p-value of 0.435, there was no statistically significant difference in bleb wall vascularity between the two groups.

Third follow-up

In the third follow-up, in the conventional group, vascularitis of the bulb wall was observed in 2 patients with mild severity (22.2%), 4 patients with moderate severity (44.4%), and 3 patients with severe severity (33.3%). In the sutureless group, vascularitis of the bulb

wall was present in 1 patient with mild severity (11.1%), 5 patients with moderate severity (55.5%), and 3 patients with severe severity (33.3%).

To investigate the relationship between vascularitis of the bulb wall and the treatment group, a chi-square test was used. According to the Pearson chi-square test with df=2 and a p-value of 0.801, there was no statistically significant difference between the two groups concerning the presence and severity of vascularitis of the bulb wall.

Fourth follow-up

In the fourth follow-up, in the conventional group, vascularitis of the bulb wall was observed in 3 patients with mild severity (33.3%), 4 patients with moderate severity (44.4%), and 2 patients with severe severity (22.2%). In the sutureless group, vascularitis of the bulb wall was present in 2 patients with mild severity (22.2%), 5 patients with moderate severity (55.5%), and 2 patients with severe severity (22.2%).

To investigate the relationship between vascularitis of the bulb wall and the treatment group, a chi-square test was used. According to the Pearson chi-square test with df = 2 and a p-value of 0.856, there was no statistically significant difference between the two groups concerning the presence and severity of vascularitis of the bulb wall.

Comparison of the reflectivity of the bleb wall in two study groups

First follow-up

In the conventional group, the reflectivity of the bleb wall was observed in 0 patients with grade 1, 4 patients with grade 2 (44.4%), and 5 patients with grade 3 (55.5%). In the Sutureless group, it was observed in 2 patients with grade 1 (22.2%), 5 patients with grade 2 (55.5%), and 2 patients with grade 3 (22.2%). To examine the relationship between the reflectivity of the bleb wall and the treatment group, we used the chi-square test and found a non-significant difference between the two groups regarding the reflectivity of the bleb wall (Pearson chi-square test, df = 2, p value = 0.183).

Second follow-up

In the conventional group, the reflectivity of the bleb wall was grade 1 in 1 patient (11.1%), grade 2 in 4 patients (22.2%), and grade 3 in 4 patients (44.4%). In the sutureless group, the reflectivity of the bladder wall was grade 1 in 1 patient (11.1%), grade 2 in 5 patients (55.5%), and grade 3 in 3 patients (33.3%). To assess the relationship between the reflectivity of the bleb wall and the treatment group, the chi-square test was used. According to the Pearson chi-square test with df = 2 and a p-value of 0.881, there was no statistically significant difference in bleb wall reflection between the two groups.

Third follow-up

In the conventional group, the reflectivity of the bleb wall was grade 1 in 1 patient (11.12%), grade 2 in 5 patients (55.5%), and grade 3 in 3 patients (33.3%). In the sutureless group, the reflectivity of the bladder wall was grade 1 in 1 patient (11.1%), grade 2 in 6 patients (66.6%), and grade 3 in 2 patients (22.2%). To assess the relationship between the reflectivity of the bleb wall and the treatment group, the chi-square test was used. According to the Pearson chi-square test with df = 2 and a p-value of 0.865, there was no statistically significant difference between the two groups.

Fourth follow-up

In the fourth follow-up, in the conventional group, the reflectivity of the bleb wall was grade 1 in 3 patients (33.3%), grade 2 in 4 patients (44.4%), and grade 3 in 2 patients (22.2%). In the sutureless group, the reflectivity of the bleb wall was grade 1 in 2 patients (22.2%), grade 2 in 5 patients (55.5%), and grade 3 in 2 patients (22.2%). To assess the relationship between the reflectivity of the bleb

wall and the treatment group, the chi-square test was used. According to the Pearson chi-square test with df = 2 and a p-value of 0.856, there was no statistically significant difference between the two groups.

Comparison of the pattern of the bleb wall in two study groups

First follow-up

In the first follow-up, in the conventional group, the pattern of the bleb wall was uniform in 3 patients (33.3%) and multinucleated (multiform pattern) in 6 patients (66.6%). In the sutureless group, the pattern of the bleb wall was uniform in 4 patients (44.4%) and multinucleated in 5 patients (55.5%).

To investigate the relationship between the pattern of the bleb wall and the treatment group, Fisher's test was used. According to Fisher's test with a p-value of 1.00, there was no statistically significant difference between the two groups.

Second follow-up

In the second follow-up, in the conventional group, the pattern of the bleb wall was uniform (uniform pattern) in 3 patients (33.3%) and multinucleated (multiform pattern) in 6 patients (66.6%). In the sutureless group, the pattern of the bleb wall was uniform in 4 patients (44.4%) and multinucleated in 5 patients (55.5%).

To investigate the relationship between the pattern of the bleb wall and the treatment group, Fisher's test was used. According to Fisher's test with a p-value of 1.00, there was no statistically significant difference between the two groups concerning the pattern of the bleb wall.

Third follow-up

In the third follow-up, in the conventional group, the pattern of the bleb wall was uniform (uniform pattern) in 4 patients (44.4%) and multinucleated (multiform pattern) in 5 patients (55.5%). In the sutureless group, the pattern of the bleb wall was uniform in 5 patients (55.5%) and multinucleated in 4 patients (44.4%).

To investigate the relationship between the pattern of the bleb wall and the treatment group, Fisher's test was used. According to Fisher's test with a p-value of 1.00, there was no statistically significant difference between the two groups concerning the pattern of the bleb wall.

Fourth follow-up

In the fourth follow-up, in the conventional group, the pattern of the bleb wall was uniform (uniform pattern) in 3 patients (33.3%) and multinucleated (multiform pattern) in 6 patients (66.6%). In the sutureless group, the pattern of the bleb wall was uniform in 4 patients (44.4%) and multinucleated in 5 patients (55.5%).

To investigate the relationship between the pattern of the bleb wall and the treatment group, Fisher's test was used. According to Fisher's test with a p-value of 1.00, there was no statistically significant difference between the two groups concerning the pattern of the bleb wall.

Comparison of intraocular pressure in two study groups

First follow-up

In the first follow-up, the mean intraocular pressure in the conventional group was 15.11 mmHg with a standard deviation of 2.71 mmHg, and in the sutureless group, it was 14.67 mmHg with a standard deviation of 3.27 mmHg. To investigate the relationship between

intraocular pressure and the treatment group, an independent samples t-test was used. Initially, to test the assumption of equal variances, the Levene's test was performed, and with a p-value of 0.556, the assumption of equal variances was confirmed. Subsequently, based on the independent samples t-test with a p-value of 0.758, there was no statistically significant difference between the two groups concerning intraocular pressure.

Second follow-up

In the second follow-up, the mean intraocular pressure in the conventional group was 15.00 mmHg with a standard deviation of 2.64 mmHg, and in the sutureless group, it was 14.22 mmHg with a standard deviation of 2.86 mmHg. To investigate the relationship between intraocular pressure and the treatment group, an independent samples t-test was used. The Levene's test was performed to test the assumption of equal variances, and with a p-value of 0.799, the assumption of equal variances was confirmed. Subsequently, based on the independent samples t-test with a p-value of 0.558, there was no statistically significant difference between the two groups concerning intraocular pressure.

Third follow-up

In the third follow-up, the mean intraocular pressure in the conventional group was 14.00 mmHg with a standard deviation of 3.00 mmHg, and in the sutureless group, it was 15.00 mmHg with a standard deviation of 3.16 mmHg. To investigate the relationship between intraocular pressure and the treatment group, an independent samples t-test was used. The Levene's test was performed to test the assumption of equal variances, and with a p-value of 0.999, the assumption of equal variances was confirmed. Subsequently, based on the independent samples t-test with a p-value of 0.501, there was no statistically significant difference between the two groups concerning intraocular pressure.

Fourth follow-up

In the fourth follow-up, the mean intraocular pressure in the conventional group was 14.22 mmHg with a standard deviation of 2.94 mmHg, and in the sutureless group, it was 14.55 mmHg with a standard deviation of 3.12 mmHg. To investigate the relationship between intraocular pressure and the treatment group, an independent samples t-test was used. The Levene's test was performed to test the assumption of equal variances, and with a p-value of 0.973, the assumption of equal variances was confirmed. Subsequently, based on the independent samples t-test with a p-value of 0.819, there was no statistically significant difference between the two groups concerning intraocular pressure.

Repeated measures analysis

In the analysis, the Mauchly's test was not significant. The Greenhouse-Geisser correction was used, and with a p-value of 0.86, there was no statistically significant difference in the mean intraocular pressure over the follow-ups within each group.

In the overall analysis, the between-subjects effects test with a p-value of 0.97 showed that there was no statistically significant difference in the mean intraocular pressure between the two groups across all follow-ups.

Discussion

Currently, the most common surgical procedure for treating cases of treatment-resistant glaucoma is trabeculectomy. This procedure is considered one of the shunt surgeries. Trabeculectomy can be performed using two methods: Conventional and sutureless, both of which are comparable in terms of efficacy for reducing intraocular pressure. Further studies are underway to compare the efficiency of these two surgical approaches. One of the critical factors affecting the efficacy of trabeculectomy is the morphology of the bleb formed after the surgery, which is usually assessed through clinical examination using a slit lamp [11]. ASOCT is one of the new methods for high-precision measurement of bleb morphology, and its usage is increasing [12]. The purpose of this study was to compare the surgical

efficacy of these two methods (Conventional and Sutureless) in creating a functional bleb and controlling intraocular pressure, using ASOCT to evaluate post-surgery bleb morphology. In our study, information from 18 eyes of 18 patients was examined. Of these, 8 were male and 10 were female, and there was no statistically significant difference between genders in the two groups.

The mean age of patients in group A (Conventional) was 50.67 ± 24.31 years, and in group B (Sutureless) it was 47.33 ± 23.91 years, with no significant age difference between the two groups. In this study, patients undergoing trabeculectomy using the conventional and sutureless methods were evaluated, and the morphological characteristics and intraocular pressure were measured in 4 follow-up stages.

The bleb height in all follow-up stages was higher in the conventional group compared to the sutureless group, but the differences were not statistically significant. Similarly, bleb width and wall thickness were greater in the conventional group in all follow-up stages (except the 2nd), but the differences were not statistically significant. Vascularity of the bleb wall did not show any significant differences between the two groups in any of the follow-up stages.

The reflectivity grade of the bleb wall was lower in the sutureless group during the first follow-up and higher in the sutureless group in the other follow-up stages compared to the conventional group, but again, the differences were not statistically significant.

The uniformity pattern of the bleb wall was greater in the sutureless group in all follow-up stages, but no significant differences were observed between the two groups.

In terms of intraocular pressure, during the first and second follow-ups, IOP was higher in the conventional group compared to the sutureless group, but during the third and fourth follow-ups, IOP was lower compared to the sutureless group. However, these differences were not statistically significant.

Conclusion

In this study, various parameters such as bleb's height, width, wall thickness, wall reflectivity, wall pattern, wall vascularity, and intraocular pressure were examined. No statistically significant differences were observed in these parameters between the two study groups. Thus, it can be concluded that trabeculectomy surgery using conventional and sutureless techniques are comparable in terms of morphological and functional parameters, and no specific superiority was observed between the two methods. Therefore, the choice of surgical method remains at the discretion of the operating surgeon.

However, considering the chronic and detrimental effects of uncontrolled intraocular pressure in glaucoma, it is recommended to conduct further studies with longer follow-ups and larger sample sizes. Additionally, examining comparative studies with other surgical methods for glaucoma treatment can be beneficial.

Bibliography

1. Kojima Sachi., *et al*. "Filtering blebs using 3-dimensional anterior-segment optical coherence tomography: a prospective investigation". *JAMA Ophthalmology* 133.2 (2015): 148-156.

2. Kim Dong Myung., *et al*. "Comparison of localized retinal nerve fiber layer defects between a low-teen intraocular pressure group and a high-teen intraocular pressure group in normal-tension glaucoma patients". *Journal of Glaucoma* 16.3 (2007): 293-296.

3. Kokubun Taiki., *et al*. "Quantification of the filtering bleb's structure with anterior segment optical coherence tomography". *Clinical and Experimental Ophthalmology* 44.6 (2016): 446-454.

4. Oh Lawrence J., *et al*. "Comparison of bleb morphology between trabeculectomy and deep sclerectomy using a clinical grading scale and anterior segment optical coherence tomography". *Clinical and Experimental Ophthalmology* 45.7 (2017): 701-707.

5. Yarmohammadi Adeleh., *et al*. "Relationship between optical coherence tomography angiography vessel density and severity of visual field loss in glaucoma". *Ophthalmology* 123.12 (2016): 2498-2508.

6. Suh Min Hee., *et al*. "Deep retinal layer microvasculature dropout detected by the optical coherence tomography angiography in glaucoma". *Ophthalmology* 123.12 (2016): 2509-2518.

7. Lee Si Hyung., *et al*. "Vascular and metabolic comorbidities in open-angle glaucoma with low-and high-teen intraocular pressure: a cross-sectional study from south Korea". *Acta Ophthalmologica* 95.7 (2017): e564-e574.

8. Wen Joanne C., *et al*. "Comparison of anterior segment optical coherence tomography bleb grading, moorfields bleb grading system, and intraocular pressure after trabeculectomy". *Journal of Glaucoma* 26.5 (2017): 403-408.

9. Sacu Stefan., *et al*. "Correlation between the early morphological appearance of filtering blebs and outcome of trabeculectomy with mitomycin C". *Journal of Glaucoma* 12.5 (2003): 430-435.

10. Güven Yılmaz Suzan., *et al*. "Evaluation of filtering bleb function after trabeculectomy with mitomycin-c using biomicroscopy, anterior segment optical coherence tomography and *in vivo* confocal microscopy". *Turkish Journal of Ophthalmology* 45.4 (2015): 132-137.

11. Narita Akiko., *et al*. "Characteristics of successful filtering blebs at 1 year after trabeculectomy using swept-source three-dimensional anterior segment optical coherence tomography". *Japanese Journal of Ophthalmology* 61.3 (2017): 253-259.

12. Choi Woo June., *et al*. "Optical coherence tomography based microangiography for quantitative monitoring of structural and vascular changes in a rat model of acute uveitis *in vivo*: A preliminary study". *Journal of Biomedical Optics* 20.1 (2015): 016015.

Volume 15 Issue 9 September 2024