Pterygium Surgery: Autologous Blood or Suture for Conjunctival Autografting?

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ABSTRACT

**Purpose:** The aim of our study is to compare two different techniques for conjunctival autografting: surgical suturing and autologous blood coagulum.

**Methods:** In this prospective study, we randomly divided 30 patients with primary pterygium into two groups similar in matter of age and sex distribution. Group 1 underwent surgical suturing for conjunctival autografting and Group 2 underwent sutureless autologous blood coagulum for that matter. We evaluated the primary outcome in terms of operative time, patients’ discomfort, graft placement, graft failure and recurrences. The follow-up rate was at day 1, week 1, month 1, 3 months and 6 months.

**Results:** The operative time and patients’ discomfort were considerably reduced using the blood coagulum method (Operative time: Group 1 vs Group 2 is 15±3 minutes vs 32±2 minutes for Group 1) (Patients discomfort p value <0.001). The graft failure and displacement were, however, higher in Group 2 compared to the first Group (p value for both is <0.001). The recurrence rate was equal in both groups.

**Conclusion:** The use of autologous blood coagulum for conjunctival autografting is less time consuming and more comfortable for patients. However, the graft failure and displacement are more common with this technique.

**Keywords:** Autologous blood coagulum, excision, pterygium, surgery.

I. INTRODUCTION

Surgical conjunctival autografting is known to be the most common method to prevent primary pterygium recurrences [1], [2]. However, it generally requires a big amount of operative time, experience and is associated with many complications such as conjunctival granulomas, discomfort and possible infection [3]-[6].

Therefore, many other methods were suggested such as fibrin glue that rapidly gained popularity among eye surgeons for shortening the operative time and preventing the discomfort related to conjunctival sutures [7]. However, its high cost, the occurrence of glue-related hypersensitivity and infections had uttered the search for new alternatives [6], [8].

Autologous blood coagulum is a new approach that involves auto-adhesion of the graft due to a fibrinous reaction of in situ thin blood film formation [9], [10].

Many studies and trials tried to provide the efficiency and safety of this method. However, the results weren’t always conclusive. Therefore, we try through our study and experience, to determine whether the autologous blood coagulum is an eligible technique that could safely replace the suture grafting.

II. MATERIAL AND METHODS

Our study is a nonrandomized mono-centric clinical study conducted at both Military teaching hospital of Rabat and Provincial hospital of Tetouan between November 2019 and April 2022.

The study details were explained to each patient and a written consent was obtained.

We included 40 eyes of 40 patients having a primary pterygium of stage 2 and 3. The exclusion criteria were patients with coagulopathy or on anticoagulation treatment and patients who had a previous ocular surgery.

All patients underwent a full medical and ophthalmological examination with visual acuity testing, ocular motility and slit lamp examination. Then we randomly assigned patients into two groups:

- Group 1 (20 eyes) underwent surgical autograft fixing using nylon 10-0 sutures.
- Group 2 (20 eyes) underwent autograft fixation using autologous blood coagulum after the excision of pterygium.

A. Surgical procedure

The pterygium excision technique was the same for all patients and was performed by the same surgeon (AW):

- Anesthesia: Sub-conjunctival injection of lidocaine
DISCOMFORT THAN GROUP 2 (80% VS 5%) DESCRIBED AS PAIN OR 0%). WHILE PATIENTS IN GROUP 1 SUFFERED OBVIOUSLY MORE COMMON IN GROUP 2 (25% AND 20%) THAN GROUP 2 (5% AND 0%).

IN GROUP 1: THE INTRA OPERATIVE BLEEDING WAS REDUCED USING THERMIC COAGULATION AND THE AUTOGRRAFT WAS ATTACHED TO THE SCLERA AND THE REMAINING CONJUNCTIVA USING NYLON 10-0 SUTURES, THAT WERE BURIED ALONG THE PROCEDURE.

IN GROUP 2: THE SCLERA WAS ALLOWED TO BLEED, WITHOUT ANY ATTEMPT TO STOP THE BLEEDING, FOR ABOUT 3 MINUTES IN AVERAGE AND THEN THE AUTOGRRAFT WAS PLACED ON THE BARE SCLERA WITH NO SUTURES. A SLIGHT PRESSURE IS APPLIED ON THE AUTOGRRAFT TO HELP THE FIXATION OF THE AUTOGRRAFT FOR ABOUT 10 MINUTES WHILE THERE WILL BE A FIBRIN FORMATION.

B. POST OPERATIVE FOLLOW UP

POST OPERATIVE TREATMENT CONSISTED OF TOPICAL MOXIFLOXACIN 4 TIMES A DAY FOR TWO WEEKS. ALL PATIENTS HAD THE SAME FOLLOW UP RATE: AFTER 1 DAY, 1 WEEK, 1 MONTH, 3 MONTHS AND 6 MONTHS OF SURGERY.

FOR EACH PATIENT WE EVALUATED THE DISCOMFORT, PAIN AND FOREIGN BODY SENSATION, THEN THEY UNDERWENT A SLIT LAMP EXAMINATION TO EVALUATE THE GRAFT DISPLACEMENT, FAILURE AND RECURRENCE.

III. RESULTS

To analyze our data, we used SPSS software (SPSS, Chicago, USA). Mean standard deviation is used to express continuous variable while categorical ones are expressed as percent and frequency. The p value that is less than 0.05 is taken into consideration as significant value.

A. DEMOGRAPHIC FEATURES (TABLE I)

The mean age of our patients was 53.2 years. As for gender 60% were men while 40% were women. The distribution of gender and age was the same for both groups.

All the primary pterygium were located nasally. 70% were of stage 2 while 30% were stage 3.

The mean pterygium size was of 2.4 ± 0.26 mm and it was distributed equally between the two groups.

B. OPERATIVE TIME (TABLE I)

The average graft size for Group 1 was of 4.84 ± 0.28 horizontally and 6.25 ± 0.45 vertically. As for Group 2 the average size was of 4.12 ± 0.16 horizontally and 5.89 ± 0.24 vertically.

C. CLINICAL OUTCOME (TABLE II)

The operative time for Group 1 was of 32 ± 2 minutes while it was of 15 ± 3 minutes for the second group. The p value was < 0.001, thus statistically significant.

During the follow up, graft displacement and failure were more common in Group 2 (25% and 20%) than Group 2 (5% and 0%). While patients in Group 1 suffered obviously more discomfort than Group 2 (80% vs 5%) described as pain or foreign body sensation.

Over 6 months of follow up we observed slightly more recurrences in Group 1 than Group 2 (15% vs 10%).

IV. DISCUSSION

The main objective of our study was to determine the pros and cons of using the autologous blood for conjunctival autografting as an emerging technique in comparison to the classic suture conjunctival autografting.

Reference [11] were first to describe the now-well-known technique of surgical suturing for conjunctival autografting. They have demonstrated its superiority in preventing recurrences and lowering post operative complication compared to bare tissue suturing after the pterygium excision [11]. However, this technique requires surgical expertise, considerably long operative time and causes much discomfort, pain and foreign body sensation for patients [12, 13].

Therefore, [7] suggested the use of fibrin glue instead of surgical suturing for conjunctival autografting through a study of 325 patients, shortening, hence, the operation time and lowering the rate of recurrences (5.3% vs 13.5% for surgical suture group).

Although seemed as a promising less invasive method, fibrin glue conjunctival autografting is not without complications. In addition to its higher cost, it has been proven that this technique has greater infection risks and causes hypersensitivity reactions [6], [8].

A novel method for conjunctival autografting was then described, using the patient’s own blood clotting factors as natural glue [14], [15]. After pterygium excision, blood vessels are left to bleed until clotting naturally. A light pressure is put on the conjunctival graft to facilitate the adherence to the blood coagulum. This method is shown to have less infectious risk with a minimal cost [1], [6].

Upon this description, studies -including ours- have rushed to weigh the benefits and risks of this new technique. [15] compared both techniques of surgical suturing and autologous blood fixation for conjunctival autografting and
came to the conclusion that in the later group the incidence of graft failure and graft displacement was significant in group 2 versus the first one (12.5 vs 6.25).

Reference [16] compared three groups of patients using three different autograft fixation methods: surgical suturing, fibrin glue and autologous blood coagulum. They concluded that in terms of recurrence all three techniques were the same but postoperative discomfort was highly associated with surgical suturing method.

Two studies compared the use of fibrin glue and autologous blood coagulum: [17]-[19] have concluded to the fact that graft stability and graft retraction rates were considerably high among patients who had undergone the second procedure.

In a recent study, [20] divided 30 patients into two groups of 15 patients each. The first group underwent a sutureless autologous blood coagulum procedure while the second had a standard surgical conjunctival autografting. Although the first group had less post operative complaints, discomfort and pain but they suffered more graft displacement (20%) and more graft instability (20%) than the first group. However, the two groups were similar in terms of recurrences.

A systematic review and metanalysis of seven studies conducted by [21] concerning a general comparison between the two autografting techniques (autologous blood coagulum versus surgical suturing) came to the conclusion that using blood coagulum is associated to less postoperative discomfort, an even recurrence rate but higher risk of graft displacement.

In our study we compared two conjunctival autografting techniques: surgical suturing versus sutureless autologous blood coagulum. Our conclusions align with those of literature’s since we found that using autologous blood coagulum method is less time consuming, less painful, inexpensive but with higher rate of graft displacement and failure. As for recurrence rates they are the same in both grafting methods. Thus, we recommend the use of autologous blood conjunctival autografting for patients with no eye rubbing habit nor allergies.

V. CONCLUSION
To sum up autologous blood coagulum can be considered as an alternative to surgical sutures for its simpleness, low rate of recurrences and low post operative discomfort. However, the high occurrence of graft displacement and failure can’t make of it a replacement of surgical suturing. Further studies with much larger numbers of patients are required to more accurate conclusions.

CONFLICT OF INTEREST
Authors declare that they do not have any conflict of interest.

REFERENCES