

CONJUNCTIVAL AUTOPLASTY VERSUS CONJUNCTIVAL AUTOPLASTY AND GRAFT WITH AMNIOTIC MEMBRANE IN SURGICAL TREATMENT OF EXTENDED PTERYGIUM

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Keywords: pterygium, conjunctival autoplasty, amniotic membrane

Abstract: Background: Assessment of efficiency and safety of two surgical methods for treatment of extended pterygium. Materials and method: This work describes a retrospective survey performed on 48 patients, divided in two groups: Group 1, comprising 24 patients, undergoing excision of pterygium and conjunctival autoplasty and Group 2, comprising 24 patients, undergoing excision of pterygium, conjunctival autoplasty and grafting with amniotic membrane. Patients underwent surgery during January 2009 – December 2013, with a follow-up period between 6 months and 24 months. Checks were made for occurrence of relapse, type and incidence of complications. Results: Relapse occurred in 2 cases within Group 1 (8.3%) and in 2 cases within Group 2(8.3%) Complications: In Group 1, graft shifting was observed in two cases, occurrence of perilimbal corneal ulcer in two cases and dehiscence of conjunctival suture in one case. (20,8%) In Group 2, only one case was detected with occurrence of dehiscence of conjunctival wound (4,1%) Conclusions: Grafting with amniotic membrane reduced the number of post-surgery complications after excision of extended pterygium

Cuvinte cheie: pterigion, autoplastie conjunctivală, membrană amniotică

Rezumat: Scop: Evaluarea eficienței și siguranței a doua metode de tratament chirurgical al pterigionului extins. Material și metodă: Lucrarea descrie un studiu retrospectiv efectuat pe 48 de pacienți împărțiți pe două loturi: Lotul 1 cu 24 de pacienți la care s-a efectuat excizia pterigionului și autoplastia conjunctivală și Lotul 2 cu 24 de pacienți la care s-a efectuat excizia pterigionului, autoplastia conjunctivală și acoperire cu membrană amniotică. Pacienții au fost operați în perioada ianuarie 2009 și decembrie 2013, perioada de urmărire între 6 luni și 24 de luni. S-a urmărit apariția recidivei, tipul și incidența complicațiilor. Rezultate: Recidiva a apărut în 2 cazuri din lotul 1(8,3%) și în 2 cazuri din lotul 2(8,3%). Complicații: În Lotul 1 s-a observat derapajul greței în două cazuri, apariția ulcerului cornean perilimbal în două cazuri și dehiscența suturii conjunctivale într-un singur caz(20,8%). În Lotul 2 s-a observat doar într-un singur caz dehiscența plăgii conjunctivale(4,1%). Concluzii: Acoperirea cu membrană amniotică a redus numărul de complicații postoperatorii după excizia pterigionului extins.

INTRODUCTION

Pterygium represents a fibrovascular proliferation of conjunctival origins which extends at corneal level. This condition shows increased incidence in areas with hot and dry weather, in individuals performing outdoor activities.(2) Pterygium is treated surgically. Numerous types of surgical procedures are available, proving that neither of them showed significant advantages compared to the others.(8) One of the specifics of this medical condition is relapse after excision, each type of procedure attempting to reduce the relapse rate.

Among the surgical treatment methods, we may state here: simple pterygium excision, excision followed by conjunctival autoplasty, excision followed by graft with amniotic membrane, excision followed by treatment with antimetabolites, excision followed by beta-radiation.(8)

PURPOSE

The aim of this survey is the assessment of efficiency and safety of two surgical methods that we used in the treatment of extended pterygium: excision followed by conjunctival autoplasty, and excision followed by conjunctival autoplasty and then followed by amniotic membrane grafting. Why did we

select these methods? In our opinion, simple excision of pterygium shows an unacceptably high rate of relapses(7), and reconstruction of conjunctival damage in case of a large pterygium may prove difficult.

Conjunctival autoplasty is a relatively simple method, from technical standpoint. It allows excision of a large area, possibly of healthy conjunctiva superior and inferior to pterygium; it provides, in theory, the advantage of reconstruction of sclerocorneal limbus, allowing a fast epithelization.(5) As for its disadvantages, it is a surgical procedure which takes a relatively large amount of time, suture threads may cause an irritation with few weeks of persistence, and collection of graft from upper quadrant may incur certain shortcomings, in case the patient will need further glaucoma surgery.

Since excision of large - possibly deep - pterygiums at corneal level leaves large areas of deepithalized cornea, we decided to cover the ocular surface with amniotic membrane, aiming for a homogenous epithelisation and for a less disturbing symptomatology during healing period.

The amniotic membrane is made of an avascular stroma and a thick basal membrane, made mainly of

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Article received on 09.07.2014 and accepted for publication on 22.08.2014
ACTA MEDICA TRANSILVANICA September 2014;2(3):196-198

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collagen and laminin. It facilitates migration of epithelial cells and prevents apoptosis thereof. It contains growth factors (epithelial growth factor, EGF, keratinocyte growth factor-KGF), with additional effect in promotion of epithelization. Due to its capacity to inhibit the transforming growth factor beta - TGF - beta the amniotic membrane reduces stromal scarring, a useful mechanism in cases where pterygium infiltrates corneal stroma.(6)

METHODS

We performed a retrospective survey, on 48 patients with extended pterygium. We defined extended pterygium to be a pterygium extending in excess of 4 millimetres on cornea or which had, at limbus level, more than 6 hours (one quarter of limbus circumference). The group of patients was divided randomly in two 24 patient subgroups; for the first subgroup, we performed pterygium excision and conjunctival autoplasty, and for the patients in the second subgroup pterygium excision and conjunctival autoplasty were followed by amniotic membrane grafting.

Patients were treated surgically by the same surgeon during January 2009 - December 2013.

Patients were followed-up based on the following schedule: in the first post-surgery day, upon discharge, between 2 and 3 weeks, upon removal of suture threads, after one month, after 3, 6, 12, 18 and 24 months. After the 1-month control, patients were advised to return for examination in case they notice any sign of relapse. The minimum follow-up period was of 6 months, it varied between 6 and 24 months, with an average value of 11 months.

During the first controls, the following were checked: epithelisation in graft collection area, graft position and epithelisation of cornea. Subsequently, occurrence of relapse was also checked. The technique for conjunctival autoplasty consisted in the following steps: excision of pterygium was performed from corneal level, starting from limbus towards the tip.

After dissection of pterygium head from the cornea, conjunctiva was stripped off, superior and inferior to pterygium, at limbus, and then pterygium body was excised starting from 1 millimeter superior and inferior to the entry spot on cornea, and diathermy was performed on sclera bed.

We collected the autograft from the upper quadrant of the same eye, we injected adrenaline 1:5000 between conjunctiva and Tenon capsule as we can see in figure no. 1 (image from personal archives) to facilitate dissection of conjunctiva and to reduce bleeding; the graft must be checked for fragments of Tenon capsule.

Figure no. 1. Adrenaline injection



Graft sizes must be approximately equal to the affection, to prevent any tension.

We used a pediculate graft, rotating it around the supero-nasal corner; we consider that pediculate graft shows higher integration rate compared to the free graft. We fastened the graft to the limbus, on superior and inferior sides, also

passing through episclera, to prevent retraction, as the suture was made with separate 10.0 threads. We did not suture conjunctiva remaining at collection point.

In case of group 2, the amniotic membrane was collected from pregnant women who gave birth through caesarian section; pregnant women were tested, upon the start of pregnancy, for HIV 1 and 2 virus, hepatitis B and C and syphilis, tests which were redone upon hospitalization for caesarian section surgery. The surgical intervention was performed in a similar manner up to the point where we prepared the conjunctival graft; we covered the ocular surface: complete cornea, area where we collected the graft, area where pterygium body was excised. The amniotic membrane was applied with epithelial side upwards. We fastened the membrane with 10.0 threads to the conjunctiva in temporal and inferior sections, we underlapped it underneath Tenon capsule at the level of pterygium excision area and we fastened it to the Tenon capsule in upper side, where the graft was collected then we applied conjunctival autograft above amniotic membrane, so that threads used in suture of graft were also passed through the subjacent amniotic membrane.

RESULTS

In the first day after surgery, no cornea was epithelized in pterygium excision area, and all grafts were normally positioned. At the first examination 2-3 weeks: In subgroup 1, where excision was performed with conjunctival autoplasty, we encountered the following incidents:

Graft shifting as we can observe in figure no. 2 (image from personal archives) largely from limbus level, being pulled towards the nasal, leaving a relatively large area of exposed sclera. Two such cases were observed, one after one week, the other one could not pinpoint the actual moment, and it was discovered during our examination.

Figure no. 2. Graft shifting



One case suffered perilimbal ulcer as we can see in figure no. 3 (image from personal archives) frontal to graft, relatively superficial, on approximately 1 millimetre from the limbus.

Figure no. 3. Perilimbal ulcer



One case showed dehiscence of conjunctival wound.

In subgroup 2, we noticed one case with dehiscence of conjunctival wound.

In all surgically treated cases, from both subgroups, cornea was epithelized, and also the area where graft had been

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collected was fully covered with conjunctival epithelia.

At the one-month examination: In subgroup 1, perilimbal ulcer deepened, despite treatment with corneal epithelization agents and interruption of local cortisone treatment, and in subgroup 2 no additional issues were seen.

Six weeks after surgery, one patient from subgroup 1 appeared, with perilimbal corneal ulcer in line with the graft.

At the three-month examination, one case of relapse was noted in a patient from subgroup 2.

Approximately four months after surgery, we noticed one case of relapse in each subgroup.

At the one-month examination, one more case of relapse was noticed in subgroup 1.

After 6 months, the number of followed-up patients reduced gradually; still, no other case of relapse or of other post-surgery complication occurred.

To summarize, we may say that:

Relapse occurred in 2 cases within subgroup 1 (8.3%) and in 2 cases within subgroup 2 (8.3%)

Complications: In subgroup 1, we had 5 cases (20.8%), two cases with perilimbal corneal ulcer, two cases with graft shifting and one case with dehiscence of conjunctival wound, and in subgroup 2 we had one case (4.1%) with dehiscence of conjunctival wound.

DISCUSSIONS

Relapse is characteristic to pterygium, any treatment type being affected by this disadvantage. Relapse after conjunctival autoplasty occurs with varying incidence in various surveys. One survey performed in Singapore on 139 cases shows a relapse rate of 20.8%, but also large deviations among surgeons, based on their experience, between 5 and 82%. (4) One survey performed in Moorfields Eye Hospital – London on 117 cases shows a relapse rate of 14%. (3) Another survey performed in Thailand on 56 cases shows a relapse rate of 5%. (1) We consider that a relapse rate of 8.3% in both subgroups is acceptable, compared to other literature data, especially since we addressed extended pterygia, where relapse probability is higher.

As for complications, they were not serious and did not affect long-term results of treatment. Yet, additional interventions were needed, which is disturbing for the patient. In the two cases of graft shifting, the first was caused by excessive rubbing of eye; in the second, probably episcleral threads were superficial and detached easily, allowing retraction of graft from the limbus. In both cases, the graft was again sutured to the limbus, fastening it to the episclera. As interventions were performed rather early – after one week for one case and no later than two weeks for the second, the graft still proved elasticity and could be easily extended. Wound dehiscence required suture in one case, and in the second case it showed favourable progress with conservative treatment, dehiscence being minimal. Perilimbal ulcers also showed varying progress; the case in first subgroup, which suffered deepening, required grafting with amniotic membrane; the other one showed good progress under treatment with corneal epithelization agents; even if a fine neovascularization occurred at this level, it did not develop towards pterygium relapse, but remained strictly confined at this level.

CONCLUSIONS

Both methods, pterygium excision followed by conjunctival autoplasty, and also the variant with the use of amniotic membrane proved efficient in treatment of extended pterygium, with an acceptable relapse rate - 8.4%.

Grafting with amniotic membrane reduced the number

of corneal complications, protecting the ocular surface in post-surgery period against alterations of lacrimal film, due to conjunctival graft, which in some cases may become prominent.

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