Pterygium excision with or without postoperative irradiation, a double-blind study

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Abstract. A double-blind study (covering 40 months) of 40 eyes with a pterygium which had not previously been operated on, was carried out to study the effect of postoperative irradiation. Nineteen eyes were treated by the 'bare sclera' operation technique only and in 13 cases (68%) a recurrence occurred within 4 months. In 18 eyes from the group of patients treated with Sr 90 irradiation on the 1st, 7th and 14th postoperative day (maximum 3 x 1000 rad) no recurrences were seen.

Patients with a recurrent pterygium and diplopia, symblepharon, visual disturbances (growth over the pupil or severe astigmatism) or many previous operations, were treated by lamellar keratoplasty (Dake, 1980). The recurrences without these complications were treated with success by the 'bare sclera' technique and postoperative irradiation.

Complications did not occur in any of the series.

Introduction

The pterygium, known since 500 B.C., occurs all over the world, but especially in subtropical and tropical areas. Because of the migration of various ethnic groups to the Netherlands the pterygium is now often seen here. The complaints which it may give rise to are a foreign-body feeling, visual loss due to corneal astigmatism or growth over the pupil, and cosmetic problems.

After surgical removal, whichever method is used, there are still many recurrences. An improvement was brought about by the 'bare sclera' technique, introduced by Ombrain in 1948. The essential part of this method is that a portion of the sclera is left without conjunctiva so that the cornea has a better chance to heal. The surface, which is rough at first, becomes covered with epithelium and does not form a jumping-off ground any more for the more rapidly growing conjunctiva. However, recurrences often occur with this method also. Lamellar keratoplasty is a successful method but is not always possible because of lack of suitable donor corneas.

A safe form of postoperative irradiation has therefore been sought for a long time, to slow the early fibroblastic proliferation. Thomas et al. in 1950 introduced a contact β-ray applicator with 5 mm penetration; the source of the radiation was Strontium 90. Other investigators obtained the best results when, after the excision of the pterygium, the irradiation was given in 3 doses:
the same day or the following day, one week later and two weeks later. The total dose was 3000–5000 rad. With the dosage no serious complications were seen (Hilgers, 1959; Zolli, 1979; Thomas, 1962; Cooper, 1978; with a follow-up of respectively 5, 3, 15 and 20 years). Thomas (1962) registered in 20% of cases slight lens opacities, which were peripheral and not progressive. Complications such as teleangiectases and keratitis seem not to occur below a dosage of 5000 rad, and other side-effects (scleral atrophy, corneal scars, iris anomalies, etc.) only at a much higher dosage (more than 20,000 rad) (Hirsch, 1957; Hilgers, 1959).

Our double-blind study was started in December 1977 for 3 reasons:
(a) because in the literature the figures for recurrences, even after postoperative irradiation, are very variable;
(b) because of the many different ethnic groups in this country;
(c) in order to compare the good results obtained in our Clinic with lamellar keratoplasty with the results of other methods of treatment.

**Method and subdivision of patients**

Every patient who came to the Out-Patients' Department with a pterygium requiring operative treatment was placed at random in an A or B group. Those patients who had already had an operation for pterygium formed group C.

**Group A.** The patients in this group were operated on by the 'bare sclera' technique, the cornea after the excision was made as smooth as possible with a Taylor’s lance and a hockey-stick keratome and a diamond-shaped piece of conjunctiva was cut away. The conjunctiva was then sutured to the underlying tissues with 2 or 3 catgut sutures in such a way that a large portion of the sclera was left bare.

**Group B.** Also contains patients who were operated on by the 'bare sclera' technique but these patients received postoperative irradiation in 3 sessions with 900–1000 rad (Sr 90 contact source). This treatment was given by the radiotherapist on the 1st, 7th and 14th postoperative days.

**Group C.** The patients in this group had recurrent pterygia and were treated in the same way as the patients in group B.

Most of the patients from all the groups were treated with a vaseline-Framycetin ointment bandage for a short time after the operation, and a few patients were treated for 2–3 weeks with a Framycetin-steroid ointment (Sofradex).

The patients were divided into groups A or B at random, irrespective of age, sex, nationality or surgeon. The first operation included in this study was performed in December 1977, the last in September 1980. Some patients have thus been followed-up for 3 years, others for only 6 months. A few patients have also been added to this last group who failed to come to the follow-up because they had no more complaints.

*As reported elsewhere, patients with diplopia or severe astigmatism with visual disturbances, were treated by lamellar keratoplasty