TISSUE THERAPY IN PARENCHYMATOUS XEROSIS*

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PARENCHYMATOUS xerosis has been known for a very long time. Various therapeutic measures have been employed from time to time without any real success. The condition has been regarded as incurable, and Duke-Elder (1938) states that relief can be obtained only by oily drops.

Encouraged by the results of keratoplasty, I decided to try the operation of conjunctivoplasty in the so-called incurable condition of xerosis secondary to trachoma. Sorsby (1948) and Brown (1941) reported good results from the use of specially prepared amniotic membrane grafts in conjunctival burns, but as conjunctiva was at times not available it was decided to transplant amniotic membrane. As an experimental measure a 2-mm. piece of bulbar conjunctiva was removed, and a piece of specially prepared amniotic membrane of similar size was grafted in its place in two cases. The grafts did not take, and the membrane melted away, but surprisingly enough there was marked improvement in the xerotic condition in each case. It was therefore decided to apply the simple procedure of tissue therapy in xerosis.

In 1936 Filatov first introduced tissue therapy in retinitis pigmentosa by the implantation of pieces of placenta beneath the subconjunctiva, and reported a certain measure of success (Filatov and Verbitska, 1946).

Filatov (1937) also tried tissue therapy in trachomatous pannus. Implantations of preserved cadaver mucous membrane from the lip and conjunctiva led to gratifying results. Implantations of various tissues together with intramuscular injections of cod-liver oil were included among his therapeutic procedures, and he also used vegetable products such as aloe leaves. Saint-Martin (1950) describes the use of vegetable substances by subcutaneous injection and of skin as implant. Beneficial effects have also been reported by Olontzeva and Pokrovsky (1946). In the series here reported, 25 cases have been treated by this procedure and there has been marked improvement in all of them.

Methods and Material

Preservation of Placenta.—The placenta is received on a sterile towel and washed thoroughly with sterile normal saline to remove all blood clots. A small piece of about 1 cc. is cut out of a cotyledon, placed in penicillin in saline (2,000 to 5,000 units per ml.), and preserved in a refrigerator for 48 to 72 hours before use

* Received for publication October 1, 1952.

Preparation of Patient.—Penicillin drops are instilled 2-hourly for 2 days before the operation. The lashes are cut and the eye cleaned on the morning of the operation. Care should be taken to exclude any discharge from the eye which may later lead to sepsis. Two per cent. anethane is used for local anaesthesia.

Technique of Grafting.—Small fragments of placenta of about 1 c. mm. are cut from the preserved piece. The bulbar conjunctiva is then cut and a pocket made and the small piece of placenta is placed in this pocket. There is no need to stitch the conjunctiva to keep the implant in position.

Post-operative Follow-up.—Procaine penicillin, 4 million units per day, is given intramuscularly for 5 days after operation. The bandage is opened the next morning and penicillin drops and liquid paraffin are instilled. There is no need for further bandaging as the conjunctiva heals within 24 hours.

Case Reports

For the purpose of treatment and review the cases were divided into three main groups:

(a) One or two dry patches were noticed in the angular portion of the conjunctiva just near the limbus (xerosis just beginning).

(b) The cornea was normal but the whole of the conjunctiva looked dry.

(c) The whole of the conjunctiva and cornea showed xerosis and vision was reduced to perception of light, or at best hand movements.

It must be stated at the outset that no cases of xerosis epithelialis were included because these can easily be treated by vitamin A injection in massive doses.

Group (a).—Thirteen cases were treated and the results obtained were remarkable. All appeared completely cured and no untoward reaction was observed. Most of the cases required grafting twice or thrice, and a few required as many as six grafts before the condition yielded to treatment.

Group (b).—Nine cases were treated and the results obtained were equally encouraging though it was a long time before good results were obtained. In a few cases as many as eight to ten grafts were given in each eye. In every case the xerosis started clearing from the fornix and the limbal region was the last to clear. The conjunctiva first regained its lustre, and the moistening of the conjunctiva by tears was the last stage in improvement.

Group (c).—Three cases were treated and the results obtained though encouraging were not so good as in the other groups. Considering that these patients were otherwise condemned to blindness, no other treatment being of any avail, the results obtained were a real improvement.

Case 1, male, aged 35, complained of gradual diminution of vision and a sensation of dryness in the eyes for the last 3 years. Follicles were present on the palpebral conjunctiva; the cornea was lustreless, dry, and practically opaque. Examination of the interior of the eye was impossible. Vision was reduced to hand movements only, both eyes being equally affected. After eighteen grafts vision in the right eye improved to 6/18 and in the left to 6/36. Dryness was still present over a limited area but the extent was less than before.

Case 2, male, aged 30, complained of gradual diminution of vision for the last 2 years. The conjunctiva and cornea in each eye were dry and lustreless. Vision in both eyes was reduced to hand movements. After twenty grafts, vision in the right eye was 6/36 and in the left 6/60. Dryness was completely absent.

Case 3, male, aged 37, had experienced gradual loss of vision for 2½ years. Treatment with oily drops had been given at various clinics without any improvement. The right eye was found to be the more affected. Vision in the left eye was 3/60 while in the right it was hand movements

only. After sixteen grafts vision in the right eye improved to 6/36 and in the left to 6/18. Dryness was still present in the right eye over a very limited area.

Pathology

A section taken from a biopsy before treatment (Fig. 1) shows stratified squamous epithelium on one side and loose connective tissue on the other. The epithelium as a whole is thickened and shows keratin deposits on the surface of its entire length except for one small area. The malpighian layer shows a well-marked stratum granulosum beneath the keratinized layer. The

FIG. 1.—Section of conjunctiva biopsy before treatment. Haematoxylin and eosin. $\times 430$.

FIG. 2.—Section of conjunctiva biopsy after treatment. Haematoxylin and eosin. $\times 430$.

cells are laden with blue-staining kerato-hyaline granules. The prickle cells show prominent intercellular bridges and some show mitosis and pyknosis. The individual prickle cells in some places show marked vacuolation just beneath the layer of cells containing kerato-hyaline granules. The cells of the basal layer are cuboidal and some show deposition of pigment, which is probably melanin. The subepithelial tissue shows prominence of blood vessels. There is marked round cell infiltration of lymphocytes and plasma cells. The distribution of inflammatory cells is at places perivascular and at others irregular.

After treatment the epithelium shows normal conjunctival histology with no evidence of formation of keratin. Goblet cells are not seen. In the subepithelial tissue a few lymphocytes are seen (Fig. 2).

Summary

Twenty-five cases of various grades of parenchymatous xerosis were treated successfully by subconjunctival implantations of placenta. The technique of preserving the placenta and the preparation of the patient for operation are described. The post-operative follow-up and final results in three types of case are reported. The first two were completely cured and in the third marked amelioration resulted.

The histological appearances of conjunctiva in parenchymatous xerosis before and after treatment are illustrated.

In this series, the condition known as parenchymatous xerosis, which has so far eluded treatment, was successfully treated by subconjunctival implantations of placenta. The mode of action of this tissue therapy is still uncertain but it is believed to be due to some kind of biogenic stimulator.

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