Introduction

Since the year 2000, the Blond McIndoe Research Centre, Corneo-plastic Unit and Eye Bank have been collaborating closely to perform ex-vivo (laboratory-cultured) stem cell transplantation. The project has ethics approval and work is still continuing. Published results have proved very encouraging.

What did we do?

The Blond McIndoe Research Centre used donor rims (the remaining eye tissue) discarded following corneal transplantation and cultured sheets of stem cells using samples from the limbus (the area where the white portion of the eye meets the cornea and the location of stem cells).

These sheets were transplanted to suitable recipients who had **stem cell deficiency** as a result of injury or congenital (inherited from birth) deficiency. The sheets were secured using amniotic membrane (protective lining that surrounds babies while developing in the womb).

What did we find?

Our work is not unique and similar ex-vivo transplantation is performed at other centres in Italy, Japan, Taiwan, USA and more recently India. Seven of our first 10 patients (70%) had an improvement in the condition of their ocular surface. That is not to say the surfaces completely normalised. Patients did improve over time and after between 5 and 18 months some had to have corneal grafts to further improve their vision. The 'breakthrough' that has been made by our group relates to the results of DNA fingerprinting on our patients who have had successful restoration of their ocular surfaces. We found that there was no donor DNA on the surface of the eye, which suggests that the patient's own body has played a part in restoration of the surface and continues to maintain a normal surface. This has TWO implications 1) there is no need for long-term immune suppression (strong anti-rejection drugs) and 2) these findings may be repeatable in the regeneration of tissue in other parts of the body, an area that merits further investigation.

Is this treatment available to NHS patients

Yes, this is an NHS development and, because of the complex nature of the diseases involved, patients are typically treated in a specialist centre within the NHS.

Who can be treated?

Only those with problems involving the **eye surface,** in particular those patients who have limbal stem cell deficiency. These include those who have had chemical (acid or alkali) injuries, thermal injuries or Stevens-Johnson Syndrome, resulting in damage to the limbus. There is also a group of patients who have a congenital deficiency of stem cells, including those with aniridia and ectodermal dysplasia.

Who can be treated?

People with eye problems that do not involve the eye surface and cornea are not suitable for this treatment. Examples of conditions that **cannot** be treated include:

- age related macular degeneration
- retinitis pigmentosa
- optic neuritis and other problems of the optic nerve
- severe eye injuries involving the retina (back of the eye)
- Keratoconus
- Fuchs' corneal dystrophy

Further queries

Should you have any further questions or concerns please do not hesitate to contact us:

Corneo-Plastic Unit (eye clinic)
Tel: 01342 306782
9.00am - 5.00pm

For enquiries out of hours, weekends and bank holidays, please contact: Ross Tilley Ward. Tel: **01342 414451** or Switchboard. Tel: **01342 414000**

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Stem Cell Transplantation Fact Sheet

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