Photodynamic therapy (PDT) for the Treatment of Ocular Tumours

Introduction

Photodynamic therapy (also called PDT) was originally used for wet age-related macular oedema; however, it is now more frequently used in the treatment of tumours of the eye. There are published reports proving its success in choroidal hemangiomas, melanomas and metastatic tumours, as well as other ocular tumour conditions, which are the indications that we are using it for.

PDT is a treatment that can potentially destroy unwanted tissue. PDT destroys cancer cells with a fixed-frequency laser light in combination with a photosensitizing agent that is injected into the bloodstream. The photosensitizing agent alone is harmless and has no effect on either healthy or abnormal tissue. However, when laser is directed onto tissue containing the drug, the drug becomes activated and the tissue is rapidly destroyed. The laser light used in PDT is directed through a fiber-optic placed close to the hemangioma to deliver the proper amount of light and selectively target only the abnormal tissue.

How does photodynamic therapy work?

The principle of the treatment is that a photosensitive dye (visudyne) is injected into your bloodstream. The dye alone is harmless to both normal and abnormal tissues; however, when laser is directed onto the tissue containing the dye it becomes activated and the tissue is rapidly destroyed. The wavelength of the laser light coincides with the wavelength of the Visudyne such that the laser light is preferentially absorbed into the abnormal blood vessels. Thus, photodynamic therapy selectively treats the tumour without compromising the function of the rest of the eye. Each treatment has varied effectiveness and therefore repeat treatment may be necessary.

Before your procedure

- When you arrive at the clinic, we will ask you for details of your medical history and carry out any necessary clinical examinations and investigations, including weight and blood pressure and a vision check.
- We will put drops in your eyes to dilate your pupils which will take about 20 to 30 minutes. These drops will cause your vision to be temporarily blurred and will make your eyes more sensitive than usual to bright light for up to 24 hours.
- There will be an opportunity for you to ask us questions about the procedure during the time it takes for your pupils to dilate. However, please feel free to discuss any concerns you might have at any time.
Many people will have had a fluorescein angiogram and/or indocyanine green angiography, which involves taking some photographs of the back of your eye after a dye is injected in your arm. The ophthalmologist uses these photographs to help with the assessment of your condition.

**What does photodynamic therapy involve?**

It is carried out on an out-patient basis and takes approximately 40 minutes. On arrival at our centre, the nurse will meet you and take some preliminary measurements e.g. height and weight. Your vision will be assessed and pupils dilated after discussion with your Consultant and consent taken.

- A specially trained nurse will give you an injection of Visudyne (the light-activated medicine) through a flexible tube (cannula) in your arm, which will take about 10 minutes.
- A nurse will stay with you throughout this procedure.
- We will put some anaesthetic drops in your eye before the laser treatment. A contact lens will be placed on your eye for the laser treatment which helps the laser light to be focused on the affected area at the back of your eye.
- We will then carry out the laser treatment. This involves shining a special red laser light into your eye for 83 seconds, or multiples thereof.

**Possible side effects of photodynamic therapy (PDT):**

- The Visudyne can rarely leak out of the vein at the injection site which can cause pain, swelling and inflammation.
- About 2% of patients experience some back pain while the Visudyne is being given, which can be helped by moving around (e.g. walking a few paces) until the pain resolves.
- Some patients experience a temporary mild blurring of vision following treatment. If you do have any visual problems following treatment, we advise you not to drive or use machinery until the blurring disappears.
- Between 1% to 4% of patients experience a severe, but usually transient, decrease in vision in the treated eye following treatment. Occasionally this decrease in vision can be permanent. If you experience prolonged vision loss, please seek advice from your ophthalmologist as soon as possible.
- Unfortunately for melanoma, metastasis despite successful treatment of the eye.

**Special measures to take after photodynamic therapy (PDT):**

- You will need to protect your skin from sunburn for 48 hours after the procedure, because Visudyne makes your skin more sensitive to light (photosensitivity).
- You will therefore need to avoid exposure to direct sunlight and bright indoor light (such as tanning salons, bright halogen lights or operating lights used by surgeons or dentists). ‘Normal’ indoor lighting is safe.
- If you are exposed to any of the above lights, please wear protective clothing and dark sunglasses to protect yourself. Sunscreens offer no protection.
• However, do not just stay in the dark, because exposure to normal indoor lighting will help your body clear the Visudyne more quickly.

Follow up appointments

Photodynamic therapy (PDT) can involve repeat treatments over a period of 6 months. You will receive an appointment to review your progress and if required, fluorescein angiography and photodynamic therapy (PDT) will be repeated as before.

Intended benefits of photodynamic therapy (PDT):

1. Local tumour control – For melanoma this is approximately 80%.
2. Preserve as much vision as possible

Alternative procedures that are available

You do not have to receive treatment for your condition, although without treatment, these diseases can lead to further vision loss and blindness, and in some cases may also spread to other areas of the body. Further treatments are available such as other radiotherapy and chemotherapy. Surgical treatments will sometimes be used if other therapies have been unsuccessful.