Contact radiotherapy has been used for the treatment of early rectal tumours (Papillon technique) at Clatterbridge since 1993. This followed a visit to Lyon South University Hospital by Dr A Sun Myint to meet and observe the work of Professor Jean Papillon. An adapted Therapax superficial machine was used to treat 43 patients over the following seven years.

Although delivering perfectly good treatments, the Therapax was cumbersome, awkward to use and no suitable replacement system was available on the market. Fortunately, discussions between Dr Sun Myint, Dr J-P Gerard of Hospital Lacassagne, Nice, and Keith Spanswick of Ariane Medical Systems, a small company that specialises in the production of innovative medical devices, has resulted in the production of the Papillon 50.

The arrival of the Papillon 50 has coincided with a huge increase in referrals for contact radiotherapy at Clatterbridge. This may be due to several factors:

1. The new rectal cancer screening programme is identifying early stage disease. Many of these patients are unwilling to undergo major surgery and actively seek out an alternative.
2. There has been an increase in referral of patients considered unsuitable for anaesthesia. This may be due to age (the oldest patient so far is 103) or comorbidities.
3. The incidence of obesity in the UK continues to grow and has increased the number of patients unsuitable for surgery.

Papillon treatment enables the oncologist to deliver a very high dose (30Gy) per fraction to the tumour or to the tumour bed. The total dose is dependent on whether other treatment modalities are used in conjunction with Papillon radiotherapy.

As a stand-alone treatment, a patient will receive four fractions with 14 days between each fraction, total dose 110Gy. As a boost following external beam, the patient will receive three fractions, total dose 80Gy. If the patient has had TEMS (Trans Endoscopic Microsurgery) they will receive two fractions, total dose 60Gy.

**How is the Papillon treatment delivered?**

Most patients attend as outpatients. They are given a diet sheet that prescribes a low residue diet to be followed for three days prior to attending for treatment. On arrival at Clatterbridge they have two micro-enemas (5mls) inserted into the rectum. Self administration by the patients themselves has been less successful. After rectal content evacuation they change into colonoscopy shorts and a radiographer demonstrates the position that we wish them to assume on the treatment couch. A frame designed by Ariane and Clatterbridge helps to maintain this knee-chest position during treatment.

The tumour is located using a sigmoidoscope and then the applicator tube is inserted. This is locked in place using a multi-jointed fixation arm attached to the patient support frame. The x-ray generator tube is then inserted into the applicator and the treatment is delivered in less than two minutes. A camera enables constant monitoring of the tumour during treatment and image recording. There are very few treatment techniques that allow the radiographer to directly observe the tumour regressing between treatment fractions in this way (see illustration).

There are virtually no treatment side-effects and patients are able to return home immediately.

**Progress of the Clatterbridge programme**

Clatterbridge has now treated more than 300 patients using the Papillon treatment technique, over 80 of them since November 2009 when the Papillon 50 came into use. Further increases in patient numbers will be catered for by the growing number of radiotherapy centres interested in acquiring a Papillon 50. April 2010 saw the first of several training courses run at Clatterbridge; it was attended by doctors and radiographers from treatment centres in both the UK and Europe. These training courses will be held at regular intervals with the aim of passing on best practice information to oncologists, radiographers and physicists. A multi-centre study (CONTEM) is planned to ensure consistent treatment quality and pooling of outcome data.

The youngest patient treated was 30 at diagnosis and is now seven years post-treatment and one of our greatest advocates. He has written a book about his experiences (*Saving my Arse by Mark Davies*) through which he is attracting more media attention to rectal cancer and all treatment options.