Breast Cancer Chemotherapy Development in Bradford: 1950s and 1960s

George Watson and Robert Turner were deeply moved by the plight of the young mothers suffering from breast cancer, many of whom would not live to see their children grow up. “I found wards full of women basically awaiting death in the majority of cases,” said Professor Turner in a later interview, “In those days there was no treatment beyond surgery and radiotherapy.” They had become dissatisfied with conventional approaches to cancer treatment – they believed that more effective treatment could be accomplished by looking at breast cancer as a systemic disease right from the start and started to look for a further advance that could treat (and possibly prevent) the widespread dissemination of cancer throughout the body.

The most common frontline treatment for breast cancer was at this time normally simple mastectomy with radiotherapy, using radiation delivered from an external source such as an X-ray tube. Watson had already been ahead of his game in the early 50s, when he chose this then controversial method over the then more popular radical mastectomy – where the removal of breast, related lymph nodes and chest muscle was both debilitating and disfiguring for the patient. His logic was that, rather than only affecting the breast and adjacent lymph nodes as was traditionally thought, breast cancer quickly spread to lymph nodes on both sides of the chest and then to distant organs via the bloodstream – creating the secondary growths that were the “real killers.”

Hence, simple mastectomy and extensive radiotherapy of lymph nodes centrally and on both sides of the chest was, in his view not only easier for the patient to tolerate but also more effective.

It was known that breast cancers could be treated with androgen therapy (usually involving the removal of the ovaries) up to a point, however after this the tumour would fail to respond and death would inevitably follow. Researchers had come to realise that the tumor was made of two cell types – one that would respond to androgens and one that multiplied completely independent of androgen control. Even if the population of the former was wiped out, the latter could remain, causing a recurrence that would be untreatable by androgens. Alternatively, the androgen-sensitive cells could be transformed into androgen-insensitive cells as the cancer progressed, again posing problems for treatment.

In the 1940s, Louis Goodman and his colleagues in the USA worked with derivatives of nitrogen mustard (the ‘mustard gas’ so feared in World War II) – antimitotic agents found to be most damaging to haematopoietic systems and so potentially useful as a treatment for leukaemia. Robert Turner himself worked alongside Professor John Wilkinson in Manchester during the early 50s furthering this work and when he came to work in Bradford he decided that this could be put to good use in breast cancer too. Watson and Turner settled on a derivative called Thiotepa and combined it with testosterone – not only in the hopes of combining androgen and antimitotic therapies but also as testosterone was known to stimulate haematopoiesis – its inhibition being was one of the major side effects of thiotepa. In combination with surgery, they tried their new treatment on 34 women aged between 23 and 74 suffering from various stages of cancer, many of whom had gone beyond the capabilities of conventional treatment. These patients were told the exact truth about their conditions, as was George Watson’s maxim: they had an advanced disease, it was thought this new treatment could help and would they like to try it?
The results were dramatic - much more than would have been expected from either androgen therapy or thiotepa alone – they soon found that giving them both together actually enhanced their individual effects. Thirty of the thirty-four patients showed marked inhibition. While there were complications, as there would be with any treatment, some patients were cured in just two months - including a case of breast cancer during pregnancy, which was usually extremely serious. Most encouragingly, there was also a high level of response from cancers that had spread to bone and soft tissues. It was discovered that the ‘bolstering’ effect of the testosterone on bone marrow allowed much larger doses of thiotepa to be safely administered, increasing the effectiveness of the treatment.

Staggered by the effectiveness of the treatment, Watson and Turner immediately switched the frontline treatment for breast cancer at the Bradford Royal Infirmary from surgery combined with radiotherapy to surgery combined with chemotherapy and set about publishing their results in the British Medical Journal – hoping that other research centres could pick up on and expand upon their work. The newspapers were quick to proclaim their success – “Cancer: A Ray of Hope” trumpeted the Yorkshire Observer, while news even appeared in foreign papers. A Daily Express Article claimed “This is not the story of a cancer cure – but it is the most hopeful news for a long time. It may also […] lead to even more spectacular developments.” Mike Bibby, now deputy director of Institute of Cancer Therapeutics at the University of Bradford admits that “chemotherapy was also being developed in other centres at the time – for instance in the States – but Bradford was one of the first to use it on solid cancers.”

It wasn’t just the treatment that was remarkable, but also the way it would be delivered – previously patients were the sole property of just one doctor – “Instead of a patient belonging to the surgeon, or the radiologist or chemotherapist, treatment became a group responsibility,” said John Phillips, a colleague of Professor Turner’s. This approach is now part of the fabric of modern medicine. Both Watson and Turner had a great affinity with their patients and were thought of very highly for it – Veronica Leddy, now 90, underwent treatment aged 54 for breast cancer and recalls Mr Watson referring to his patients, their faces reddened by the chemotherapeutic cocktail, as the ‘healthiest in Bradford’. Another patient, who had been receiving treatment for recurrent cancers from 1941 to 1970 was taken during a check-up into the waiting room by Mr Watson and asked to tell the other patients how long she had been seeing him. Prof Turner on the other hand was known for ordering champagne for patients as part of their care plan – and helping them to drink it! He often spoke about “human being power” – the ability of someone who stayed happy and upbeat to recover more rapidly and even after he retired, patients still came for private consultations right up to his death in 1990.

However, the medical establishment soon urged caution – in some cases they were treating patients who would be considered ‘well’ yet had the potential for reoccurrence with damaging, poisonous drugs. To quote Professor Turner “All hell broke loose – because, after all, we had on one hand this surgeon actually dabbling in pharmaceutics, with a derivative of a wartime poison gas and on the other a pathologist forsaking his proper station in life, the laboratory, to actually treat living patients. We were accused of all the crimes in the medical calendar, not excluding the most heinous of offences: polypharmacy – the use of multiple drugs to treat a single disease.” One study stated “the treatment cannot be justified because of its dangers and the rather short period of remission achieved” and an editorial in the BMJ urged
“extreme caution in the premature application of chemoprophylaxis in breast cancer.”

The reception they received was so bad that Turner and his wife even considered emigrating but fortunately they kept at it.

Their ten-year results in 1977 vindicated them, although George Watson had sadly passed away in 1973, just a year after his retirement. In a survey of 254 patients, the combined 10-year survival rate for stage I and II cancer treated with mastectomy and chemotherapy was 56%, while contemporary studies into the success of mastectomy and radiotherapy only achieved around 46%. The role for adjuvant chemotherapy for breast cancer had been proven – and was now gaining favour in the scientific community, but the first steps had been taken in Bradford.

“We don’t talk of a cure, we talk of the survival rate; not only that but the quality of survival,” said Watson – Turner later added “You can forget about magic cures: it’s hard work every step of the way.”

Work continued in Bradford on chemotherapy, with the establishment of a cancer chemotherapy unit and the appointment of Bob Turner as a professor at Bradford University. They attracted fundraising attempts and soon local businessman Arnold Moore set up a charity after his wife was killed by cancer – Bradford’s War On Cancer, later to become part of Cancer Research UK. Money raised by the charity helped build a specialised cancer research centre at the University of Bradford.