



SURVIVAL BOOST FOR BRAIN PATIENTS

PATIENTS with secondary brain tumours survive more than 15 months on average when treated with Gamma Knife, according to new research.

The survival rates for patients with brain metastases are more than three months longer than previous research has shown. The study, carried out by UCLH and Queen Square Radiosurgery Centre (QSRC), found that 95 per cent of individual brain metastases treated with Gamma Knife were successfully controlled.

It provides further evidence of the benefits of Gamma Knife treatment compared with radiotherapy to the whole brain, which has average survival rates off between three and seven months.

The study also found that patients with a large number of brain metastases survived just as long as those with a small number. It found no significant difference between those who had five to ten tumours treated, compared with those who had two to four tumours treated.

The research found differences in survival length were more closely linked to the total volume, rather than the number, of tumours treated.

The study showed survival time was greatest among those who had smaller volumes treated but even those with average volumes could expect to survive more than 15 months, longer than shown in previous studies.

Lead researcher Dr Tancu said: "These results are good news for patients with brain metastases. This study showed improved overall survival and demonstrated the fact that this treatment can be offered to patients with multiple metastases while avoiding the side effects of whole brain irradiation."

TURN TO P2 >>

WELCOME to the first edition of the Queen Square Radiosurgery newsletter.

This newsletter is designed to inform patients and clinicians of the work going on at the Gamma Knife Centre in the National Hospital for Neurology and Neurosurgery.

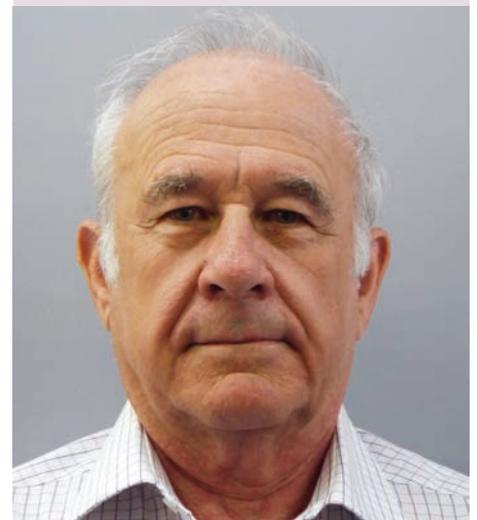
We aim to bring you news of the latest developments and examples of the kind of treatments available at one of Britain's leading radiosurgery centres.

QSRC is one of the UK's two supra centres for stereotactic treatment offering the full range of intracranial procedures.

This first issue focuses on new research at QSRC showing survival times for patients with secondary brain tumours may be longer than previous thought. It also highlights the story of one patient who was able to get his life back on track after having a three-stage treatment for large metastases at Queen Square.

QSRC aims to bring you this newsletter four times a year and it will be available in printed or email form.

Comments and suggestions are welcome and can be sent to: info@queensquaregammaknife.co.uk



HOW GAMMA KNIFE SAVED MY SIGHT, See page 3



EFFECTIVE FOR MULTIPLE METS

FROM PI >> “The link between survival and total volume of metastases, underlies the need for early detection with high quality imaging and rapid access to Gamma Knife treatment”.

The research was carried out at QSRC by Dr Cornel Tancu, clinical fellow, in conjunction with Mr Neil Kitchen, consultant neurosurgeon, and Dr Naomi Fersht, consultant oncologist. It involved 156 patients who had 619 brain metastases treated during the last 5 years. These included patients whose primary disease including lung cancer, breast cancer and melanoma, as well as other cancers.

The results were more positive for patients than previous studies that found survival rates of around 12 months¹.

Gamma Knife treatment is highly focused on areas of disease, minimising damage to healthy brain tissue and reducing side effects.

QSRC is one of two NHS England National Centres of Excellence which provide specialist care and support for patients including those with rare and complex conditions. The centre works in partnership with University College London Hospitals NHS Foundation Trust (UCLH) and is located at the National Hospital for Neurology and Neurosurgery, the UK’s largest dedicated neurological and neurosurgical hospital.

Reference:
1 Yamamoto, M et al (2014) Stereotactic radiosurgery for patients with multiple brain metastases (JLGK0901): a multi-institutional prospective observational study, *Lancet*, 15 (4), pp387–395

RUGBY STAR FIGHTS FOR BETTER CARE

FORMER England rugby captain Lawrence Dallaglio has visited the Queen Square Gamma Knife centre as part of his campaign to improve cancer care.

The world cup winner, who lost his mother Eileen to cancer, is calling for patients to be given wider access to specialist radiation treatment.

He visited the QSRC to hear about the work being done to treat metastatic brain disease.

He was given a tour of the department by Mr Neil Kitchen, lead consultant neurosurgeon, and Lynne Brooks, QSRC chief executive.

“Thanks to Neil Kitchen and his excellent team at Queen Square for talking to me about the life-saving work they are doing with their Gamma Knife Machine,” he said.



The former Wasps player has been campaigning for stereotactic treatment, a precise form of radiotherapy and radiosurgery, to be made more widely available for patients.

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MEET THE TEAM

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ABOUT US

The Queen Square Radiosurgery Centre provides a Gamma Knife radiosurgery service for NHS and private patients treating brain tumours and other intracranial indications.

The Gamma Knife is not a knife at all, but a highly sophisticated, device that focuses high-energy gamma radiation on the affected area inside the brain.

Gamma Knife radiosurgery is an effective and non-invasive alternative to traditional surgery.

We are one of two NHS England National Centres of Excellence who provide specialist care and support for patients including those with rare and complex conditions.

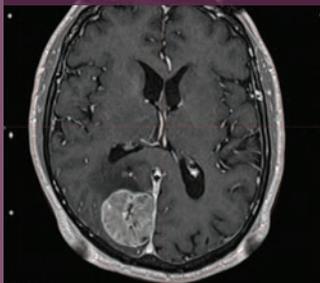
The centre enjoys a significant number of strengths from the well-established integration with other areas of expertise within the University College London Hospitals NHS Foundation Trust (UCLH).

It is located in the National Hospital for Neurology and Neurosurgery, the UK’s largest dedicated neurological and neurosurgical hospital.

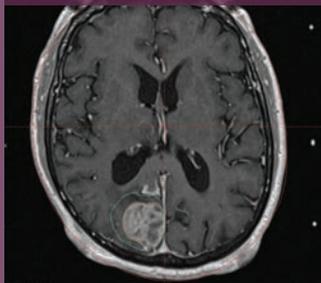
QSRC is one of two centres approved to carry out paediatric treatment by NHS England, working closely with neurosurgeons at Great Ormond Street Hospital.

PATIENT CASE STUDY - STAGED RADIOSURGERY TREATMENT

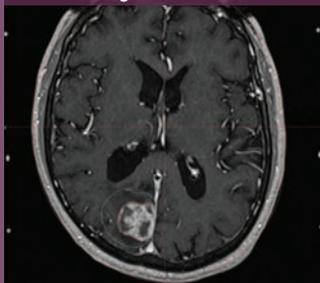
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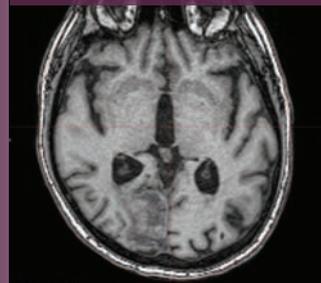
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March



Colin's tumour shrank in diameter from 3.5cm at the first treatment to 2.3cm at his follow-up scan, restoring his vision.

COLIN Gaul has always loved working the land. As a young man he worked on a farm, starting a lifelong love of getting his hands dirty. But when his vision started to deteriorate last year, he was forced to give up the garden he cherished. It was the first sign the cancer that started in his kidneys had spread to his brain. He had been diagnosed with renal cancer in 2014 and his right kidney was removed that same year. But last September, after being sent for scans to investigate his vision problems and headaches, he received the news the disease had spread to his brain. Two growths had been found, the larger of which was in the occipital lobe, the section of the brain responsible for processing visual information. The 73-year-old was forced to give up gardening as well as driving, curtailing the active life he had always enjoyed.

Tumour

But Colin, a retired computer programmer, had never been one to take things lying down and immediately wanted to know his treatment options. The doctors at Mount Vernon Hospital were the first to tell him about Gamma Knife. One of the doctors talked about this treatment that had the possibility of killing it off, he said. "I had no apprehensions about it at all and was just pleased to hear there was something they could do to deal with it. I always try to be positive and try to look forward."

Colin's case was referred to Mr Neil Kitchen at the National Hospital for Neurology and Neurosurgery. It was approved for Gamma Knife treatment at a multidisciplinary team meeting despite one of the tumours being relatively large. Colin was admitted to the hospital last November to begin his treatment. He had a treatment frame fitted under local anaesthetic and was then sent for an MRI with contrast to get the very latest information on his disease.

The images showed one marble-sized lesion in the left cavernous sinus and a second larger lesion in the occipital lobe that was slightly smaller than a golf ball. The treatment of the first tumour would be relatively unproblematic and could be completed on the day. But the size of the larger tumour would require a more innovative approach. Treating such a large volume in one go presented unacceptable risks to the patient.



A single treatment of a lesion this size might cause side effects such as swelling, bleeding and further deterioration of vision. So the doctors, physicists and radiologists involved in drawing up his treatment plan decided to split the dose into three treatments. This would allow Colin some time to recover between each treatment making it safer and more effective. Alex Dimitriadis, gamma knife physicist said the technique was first developed by a group of Japanese doctors (Higuchi et al, 2009) who

coined the term "staged radiosurgery". He said: "This allows the treatment of large tumours that would traditionally be avoided in single session radiosurgery. This technique exploits radiobiological principles to make the tumour more vulnerable to radiation. It is also a safer approach than single session treatments for lesions of this size." The rationale behind the plan was explained to Colin and he began his gamma knife treatment that day. The process was then repeated for a second and third time over the space of 11 weeks before Colin's treatment was finally finished.

Over that time the tumour shrank in diameter from 3.5cm at the first treatment, to 2.8cm at the second treatment to 2.5cm at the third treatment. By the time he had a follow-up scan in March it had shrunk further to 2.3cm. The reduction meant a significant reduction in the pressure in the occipital lobe of his brain and his vision was restored.

Vision

Colin said: "My sight is basically back to normal now which means I've started gardening again. I'm also able to drive again which I couldn't before because of the vision. I had no after effects at all and I am improving every week. I'm nearly back to normal. I found this treatment extremely good."





FINISHING THE JOB WITH GOSH

GREAT Ormond Street neurosurgeon Greg James has spoken about launching a pioneering gamma knife service to treat rare brain abnormalities in children.

The paediatric specialist appeared at Britain's leading conference on radiosurgery to give details of the treatment targeting abnormal connections between blood vessels. He was among several Queens Square gamma knife experts who spoke about the latest research and developments at the British Radiosurgery Society (BRS) meeting in July.

The GOSH neurosurgeon has been working with QSRC and University College London Hospitals for the last two years to treat vein of Galen malformations. This rare condition occurs during pregnancy and results in abnormalities between the arteries and the veins used to drain the blood from the brain. This draining occurs in the vein of Galen and problems mean the heart needs to work harder in order to compensate.

Blood flow

Patients are initially embolised at Great Ormond Street Hospital using "glue" or coils so the blood flow through the vein is reduced. Once the patient has recovered, radiosurgery can then be performed next door at the Gamma Knife Centre in the National Hospital for Neurology and Neurosurgery (NHNN). Mr James described how gamma knife treatment could then be used to shut off any remaining flow. "It allows us to finish the job when treating vein of Galen malformations," he said. "Embolisation can do most of the work but sometimes there is five to ten per cent of the flow left to treat and this can be done through gamma knife."

Mr James described how the service, which was commissioned by NHS England in 2016, had been helped by the close proximity of GOSH to the NHNN.

Patients are transferred back to Great Ormond Street Hospital within minutes of finishing treatment. Mr James, QSRC chief physicist Ian Paddick and Clinical Fellow Cornel Tancu were among the speakers at the BRS meeting in Winchester.

Mr Paddick, president of the International Stereotactic Radiosurgery Society, gave two presentations focusing on evaluating treatment plans and treating large secondary tumours in stages.

Evaluation

The first looked at ways of comparing gamma knife plans to find out which one would deliver the best treatment for a patient. He outlined how using a "gradient index" to look at the dose that fell outside the treatment target gave a good indication. He said the index allowed clinicians to judge which plans gave the most focused treatment.

The second presentation focused on the advantages and disadvantages of giving treatment in single or multiple sessions. He talked about the different effect 'staging' had when treating benign and malignant disease.

Dr Tancu, QSRC clinical fellow, gave details of a study looking at whether making small changes to the way gamma knife treatment was planned would improve outcomes for patients.

The study looked at different ways of prescribing treatment and whether changes would improve local control of secondary brain cancers and reduce side effects.

The fifth meeting of the BRS also heard presentations on measuring the quality of life among trigeminal neuralgia patients, the status of radiosurgery in India and the treatment of tumours linked to the hereditary genetic condition neurofibromatosis type 2 (NF2).



UCLH radiotherapy radiographers Maria Kilkenny and Karthica Indramohan

ICON EVENING

SOME of Britain's leading experts on radiosurgery have gathered to hear plans for a new generation of gamma knife treatment at Queen Square. Doctors, radiographers and radiotherapy experts attended an open evening at the National Hospital of Neurology and Neurosurgery to hear about plans to upgrade the QSRC treatment machine.



DLL representatives Lisa Baker and Jonathan Evans with David Miles, from GK manufacturer Elekta

Renowned neurosurgeon Neil Kitchen hosted the evening, setting out how the new ICON model would improve treatment options for patients. He described how the new machine would give clinicians greater opportunities to perform multiple, known as "fractionated", treatments. It would also allow frame-based or frameless treatments using thermo-plastic masks similar to those currently used in radiotherapy treatment. QSRC chief physicist Ian Paddick told the gathering the ICON gave greater flexibility while maintaining precision and accuracy. He described how the integrated cone-beam CT function allowed for treatment plans to be adapted to fit the precise position of the patient. He said this would minimise the dose given to healthy tissue while ensuring the maximum is delivered to the treatment target.



Gamma Knife radiographers Sasha Polonsky, Elaine Pogson and Junaid Ali