**Mr Neil Kitchen, consultant neurosurgeon**

My name is Neil Kitchen.

I'm a consultant neurosurgeon who's worked at the National Hospital Queens Square as a consultant since 1995 and I amongst my other responsibilities, I am the medical director of the Gamma Knife unit in Queens Square.

Gamma Knife is a former very focused radiation which can be used intracranially, so it's not of any use if there are problems elsewhere in the body.

But for pathologies within the head, it is a an excellent tool to accurately deliver high doses of radiation.

And for that what one needs is an A very secure head fixation system to keep the head still during scanning and also treatment and secondly imaging.

So we are entirely dependent on high quality MRICT and angiography.

I should also say there's another way of fixating the head which is which we now use on occasions that's the mask.

So this is very good on occasions, particularly when patients are not going to be compliant with frame fixation or have had previous brain surgery and problems with bone fixation from those operations and so we can't apply the frame to the head.

It does have a disadvantage however in that some patients don't like the mask.

So I'm a neurosurgeon, so I not only do operations on people, I also deliver radiation.

There is a difference between those two treatments.

With the surgery, it's often greater risk and all the side effects tend to be immediate.

With Gamma Knife, the procedure is usually safer and the side effects are pretty minimal.

However, that's not the whole story because any side effects which can occur, do occur in a delayed fashion sometimes several months later when the patients are in a in a sense out of the physicians orbit.

And so I do tell patients who have radiation treatment, yes, we can do some safe treatment here for you and you can come in and have treatment and as a day case and you go home the same day.

So that's wonderful.

But you have to be aware that there can be some side effects, significant side effects which can occur, you know later on which can have consequences.

So for example that could include headache, it could occasionally include a seizure as the tumour swells up slightly with the treatment sometimes.

And also the portion of the brain immediately surrounding the tumour does also receive some radiation so that can also react.

And any symptoms like this can actually last a few months if they do occur because it takes a while for that process to settle down again.

So although it is a minimal access day case, treatment is not, is not minimally invasive in some respects.

We're still delivering a lot of energy in in into the into the tumour we're treating.

And So what I would say to the patients is that yes, the treatment is straightforward, but we're not going to know for a few months how you've reacted both positively and also with side effects.

So when one is discussing the treatment of multiple cerebral metastases with Gamma Knife, you have to think of the practicality of the treatment, but also what it represents to the patient.

So for example, the patient may have the same amount of disease in their brain with two metastases or 20 metastases, so they might have two big ones or 20 smaller ones.

Those two scenarios are different.

So it's not number which is the issue quite often, it's the amount overall amount of disease which is important and how that's occurred.

So yes, it is possible now to treat many small metastatic tumours up to a very large number.

I wouldn't like to have a limit on it, but there comes at comes at a price because that takes the treatment times a lot longer.

So we have to look at the overall prognosis of the patient and their performance status, meaning how well they are to determine whether it's appropriate to treat so many lesions.

We have to balance what we can do technically to what we ought to be doing and we always defer back to the patient's oncologist who are looking after the whole patient and the whole patient issues.

Normally when we talk about Gamma Knife, we talk about single fraction delivery, which means treating in one session.

But that's not always what we do and there are various reasons for that.

It could be that the patient has a very large cancerous tumour, a metastatic tumour which we feel cannot be removed surgically and the patient is otherwise in reasonable health and it wouldn't be safe to treat in one fraction.

What we do is we give deliver a lower dose in three sessions, each session two weeks apart, OK.

So that's a sort of gentler treatment and we do see good results in that in in the medium term in shrinking the tumour down with less side effects than if we were to give it in a single dose.

However, there are other ways of delivering the radiation, not in a single fraction.

So for example, if there are too many metastasis to treat on one day, we do another half the following day, which is a different way of talking about fractionated treatment.

There's another group of patients with intracranial tumours where we use fractionation.

And that is those patients who have tumours, usually in the bottom of the head, what we call the skull base, around very eloquent areas such as the optic nerves, that's the nerves which to do with sight or the brain stem.

And if we really cannot treat safely in those circumstances with one fraction, we will do a fractionated treatment schedule, which is usually three or five fractions on consecutive days.

But the fractionation we're talking about is up to five fractions normally.

So the question may arise about you know what advice I have to patients who are thinking about gamma life as a form of treatment.

And I suppose the answer is I will speak to a Doctor Who has experienced not just in gamma life but has treatment in has experience in a number of treatment modalities regarding to what's the what's matter with the patient.

Because it's not the answer to everything.

It's a very, very useful adjunct and treatment option.

But there are also other options which also need to be considered and weighed up.