Letter To The Editor

An Innovative Modification of an Old Radiosurgery System

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Dear Editor,

Hospital Universiti Sains Malaysia (HUSM) is credited as one of the very first centres to offer radiosurgical services in the country. Up until February 2011, a total of 167 patients have received stereotactic radiosurgery and stereotactic radiotherapy treatment for a wide spectrum of neurosurgical conditions. Radiosurgery services in USM commenced in 2001 with the purchase of a medical linear accelerator (Siemens, Primus) complimented by treatment cones, head rings, localiser system and a workstation for planning from Radionics. The Stereotactic Radiosurgery (SRS) service in USM proved to be a vital one with patients being referred to us from all corners of the country including from East Malaysia (1,2).

In early 2011, we experienced irreparable damage to the planning workstation motherboard resulting in a temporary cessation of radiosurgical services. Attempts to reinstall the treatment planning software into a new workstation were also futile due to incompatibility between the old software version and the newer operation systems and hardware found in most of the present day computer systems. The original vendors of the Radionics system also had ceased to operate. The limitation of financial resources especially in a developing nation such as ours resulted in significant challenges in procuring sufficient funds for a complete refurbishment of the current system. In order to maximise the utility of the existing functional components of the radiosurgical equipment an effective solution was sought to replace only the planning workstation and treatment planning software. Most of the other radiosurgery systems utilised specialised equipment that only work in concert with their own treatment planning systems.

The Brain Lab iPlan software was procured after a review a various available systems in the market. Data for Radionics cones mounted on Siemens Primus were collected according to the requirements of the Brain Lab system. These include the percentage depth dose, off-axis ratios and the total scatter factors. Various other linear accelerator specific machine parameters were provided to the software. Accuracy of spatial localization was evaluated by using images of Radionics radiosurgery head phantom secured in Brain Lab localizer. Machine isocentric accuracy was tested using the Winston-Lutz film method. Accuracy of beam data and dose calculation algorithm was verified by comparing the actual ionization chamber measured dose against the planning software calculated dose in a phantom. All evaluations proved acceptable and this led to the application of our new Brain Lab iPlan system to treat two patients most recently (Figure 1).

The first case was an elderly female patient who suffered from a residual clinoidal meningioma while the second was a patient with a large posterior fossa vascular malformation. Both patients underwent radiosurgical treatment uneventfully and remain under follow up care.

We can learn from this experience that sometimes a complete change over may not always be the best solution especially when frugal fiscal policies prove to be a determinant factor in procurement. Innovative use of a combination of different technological systems such as this allowed us to salvage the original radiosurgery system and facilitated the recommencement of treatment for patients.

Authors' Contributions

Conception and design: RK
Analysis and interpretation of the data, drafting of the article: RK, SSK, NR
Critical revision of the article, administrative, technical, or logistic support: RK, NR
Final approval of the article: RK

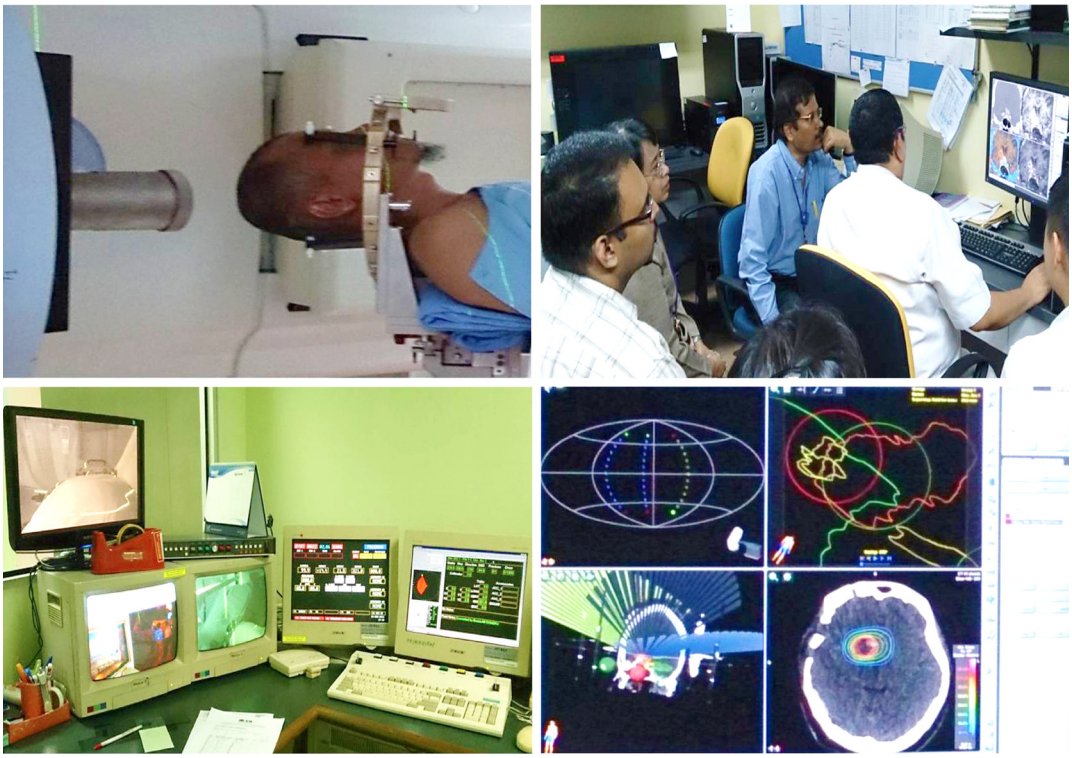

Figure 1: Steps in the Planning and Administration of Radiosurgery in USM.

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