



## Title:

### **X-knife stereotactic radiosurgery for cerebral AVM: Queen Mary Hospital experience**

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## Abstract:

### **Introduction**

This is a retrospective review of the effectiveness, safety, complications of LINAC based X-knife stereotactic radiosurgery for the treatment of cerebral AVM in Queen Mary Hospital, Hong Kong.

### **Methods**

Retrospective search through medical records of a single institution.

From 2003-2013, all patients who received X-knife stereotactic radiosurgery for cerebral AVM were included.

Demographics, presenting symptoms, size of AVM, Spetzler-Martin grading, dosages, complications, follow-up imagings were reviewed.

### **Results**

33 Patients received X-knife stereotactic radiosurgery for cerebral AVM in a 10 yr period between 2003-2013. There were 13 patients had AVM that had diameters less than 3cm, 17 patients between 3-6 cm, and 3 patients with diameter more than 6 cm. There were 12 patients with Spetzler-Martin grading 5-6, 9 patients between 3-4 and 8 patients less than 3. 19/33 of the patients received 18Gy@80%IL, with 12 patients received 13-17Gy and 4 patients received more 19-22.5Gy. Follow-up ranged from 1 year to 10 years with a median follow-up of 5 years. All patients underwent MRI or DSA follow up imaging. At 3 year MRI/DSA follow-up, we recorded a 18/33 (55%) of obliteration or reduction in size of AVM, and 12/33 (36%) total obliteration rate. 13 patients' AVM remained unchanged and 2 patients had increased in size. 21/33 (64%) of the patients reported no ill effects from the radiosurgery. 7 patients suffered from symptomatic cerebral oedema requiring a course of medical treatment for reversal of symptoms. 2 patients suffered from seizures as a result from the X-knife.

There were 3 patients (9%) that had intracerebral haemorrhage from the AVM after receiving X-knife. 2 of the 3 patients requiring surgery and one patient who bled died as a result.

### **Conclusion**

From our experience, X-knife radiosurgery for cerebral AVM offer a reasonable success rate in reduction in size or obliteration of the the AVM with the majority of the patient suffering no ill side effects. It is a feasible option of treatment particularly if the risk for open surgery is deemed to be too high. It does however carries some risks of cerebral oedema and intracranial haemorrhage. Our results of total obliteration rate of only 36% seem quite low in comparison to other reports of 80-90%. This maybe the fact that some of our AVM's were quite large in size and high in Spetzler-Martin grading. Other factor maybe the relatively short follow up. Our haemorrhage rate of 9% again also seemed quite high, compare with the 2-5 % from literature. This may be due to our small sample size. A more prolonged follow-up and more patients in future studies may perhaps be able to rectify the above.