The m3 micro multi-leaf collimator, (developed by BrainLAB and Varian) has been commissioned and is now used for conformal stereotactic radiosurgery. Treated targets have so far included brain metastases, an AVM, acoustic neuroma and recurrent glioblastoma.

Clinical commissioning involved measurement of standard characteristics (transmission, leakage, beam penumbra, etc.) as well as the accuracy of field shaping and planned dose delivery in terms of geometric and dosimetric precision. For this purpose a shaped phantom was constructed and irradiated. Multiple Portal Vision^{TM} images were acquired to verify the spatial accuracy of the planned field shaping, 3D image reconstruction and target positioning. A cubic solid water phantom and film was also used to verify the planned and delivered dose distributions. Both tests indicated high dose was delivered with a spatial precision of ≤1.5mm. Absolute dosimetry with ionisation chambers and TLDs have shown isocentre dose delivered to an accuracy of ± 3.5%.

All treated patients had both standard stereotactic arc and mMLC conformal plans calculated. Unless targets were near-spherical and/or small (≤1 cm^3) the conformal plans always produced more normal tissue sparing in the >50% dose region. For an elongated acoustic neuroma (volume 0.57cm^3; longest dimension 17mm, shortest 3mm), the arc plan required two isocentres and, therefore, lead to dose inhomogeneity within and around the GTV. The mMLC plan, using six non-coplanar fields, provided a much more homogeneous dose distribution.

DVH analysis showed improved normal tissue sparing and homogeneous PTV dose coverage for all the mMLC plans relative to those with arcs.