

RADIOSURGERY FOR TRIGEMINAL NEURALGIA USING EXACTRAC DYNAMIC SYSTEM IN A LINEAL ACCELERATOR

Purpose or Objective

The trigeminal neuralgia (TN) is a chronic, episodic, and disabling facial pain syndrome. Has a prevalence of 0.1-0.2 per thousand and an incidence ranging from about 4-5/100,000/year up to 20/100,000/year after age 60. The female-to-male ratio is about 3:2. There is a wide selection of studies concerning this issue, but only few of them describe the radiosurgery SRS technique in linear accelerator (LINAC). This study details our first experience treating TN in a Varian TrueBeam™ LINAC and Perfect Pitch™ 6 DOF patient support couch. The positioning and monitoring was performed with Brainlab Exactrac-Dynamic System®. We evaluated pain relief and morbidity after TN SRS.

Materials and Methods

Five patients were planned but only four were treated, all of them affected by medically multirefractory TN. A single isocenter of radiation focused on the intracisternal portion of the trigeminal nerve 3mm anterior to the pons. The prescription dose was 90Gy with at least 70% isodose-line covering all thickness of the nerve. The constrains to the brainstem was limited to maximal dose in contact 24Gy (26% isodose-line) in our radiotherapy plan we achieved 26% less than 0,004cm³ in all cases. Immobilization system with three layers thermoplastic mask 4pi (Brainlabs®). Positioning with stereoscopic X-ray after each couch movement. Intrafraction monitoring with X-Ray and thermal camera with accuracy less than 0.3mm and 1mm respectively. The treatment plan consists in arc-radiotherapy with 10 arcs ipsilateral to the affected nerve, all with the same weight and collimated with 4mm SRS-cone and coach movement every 10 grades. During the radiotherapy plan the contralateral side of the brain was avoided.

Results

Median follow-up after radiosurgery was 10 months (3-15 months). Pain relief was achieved for three of four patients: one after 2 weeks; other after 5 months and the last one after 1 week. The second one got his pain cycle worse 3 weeks after SRS and required intrahospital treatment to pain control. The one who didn't get pain relief has less follow up, is already possible to get pain relief after more follow up. Time latent for results can be longer y some patients. Only one patient presents hypoesthesia on the face after 4.5months; no other side effects have been reported during follow up.

Conclusion

Stereotactic radiosurgery in a LINAC is feasible technique using the Exactrac-Dynamic System® and immobilization system with three layers thermoplastic mask 4pi (Brainlabs®) can provide a safety treatment delivery. SRS is a well-established, efficient and safety option for the treatment of TN, associated with a low risk of facial paresthesia and high probability of pain relief.