

About Huashan Hospital & Huashan CyberKnife® Center

Founded in 1907, Huashan Hospital is one of the top-rated hospitals in China, and is especially well known for neurosurgery. In 2007, after installation of the first CyberKnife® G3 System in Huashan Hospital, the Huashan CyberKnife Center was established and opened to the public. The center is staffed by neurosurgeons, radiologists, radiation oncologists, medical physicists and therapists. It specializes in providing comprehensive cancer care for patients, and in the past nine years, more than 5,500 patients have been treated, including about 65 percent for intracranial tumors.

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The Huashan CyberKnife Center was one of the earliest Accuray Education Centers in China because of the willingness of the staff to share the experience for optimal use of the cutting-edge CyberKnife System.



A new CyberKnife System was installed in Huashan Hospital in 2016.

“Since introducing the Accuray CyberKnife System, the indications treated with radiosurgery have expanded from brain tumors to tumors deep in the intracranial cavity, maxillofacial tumors, lung cancer, liver cancer, pancreatic cancer, prostate cancer, bone metastases and retroperitoneal lymph node metastases.”

– Dr. En-min Wang, Huashan Hospital, Fudan University

The CyberKnife® System: Offering Better Quality of Life

A Brief History

The patient is a 47-year old female presenting with progressive dizziness. The initial MRI showed a contrast enhancing mass lesion in the right jugular foramen. The ideal primary treatment is surgical removal. However, management of these lesions is particularly challenging as a result of the complex anatomical location and potential postoperative complications. Pathological diagnosis was right jugular foramen Schwannoma after the surgical resection. It is a rare disease representing approximately 7 percent to 10 percent of all primary intracranial tumors. A postoperative MRI indicated a residual tumor with recurrence. Therefore, CyberKnife® Stereotactic Radiosurgery (SRS) was prescribed for the purpose of better tumor control.

CyberKnife Plan Parameters

Tumor Volume	23270 mm ³	Isodose Line Prescription	62%
Prescription	24 Gy/ 3 Fx	Collimator Size	12.5 mm; 15 mm
Tracking Method	6D Skull Tracking	Beam Number	155 /Fx

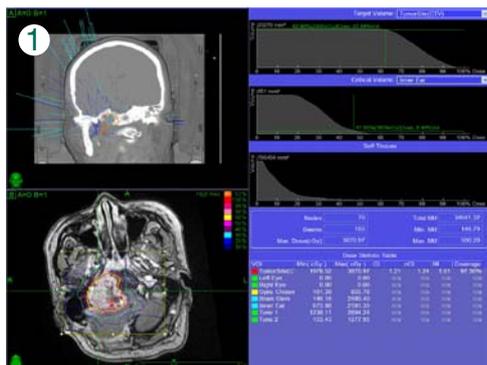


Fig 1. Treatment plan, beam geometry for lesion - CyberKnife treatments were delivered to this patient in three fractions of 8 Gy per fraction employed 6D Skull Tracking.

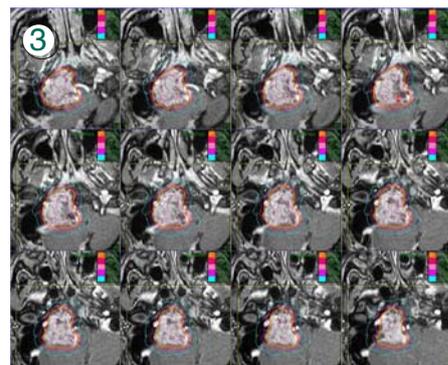
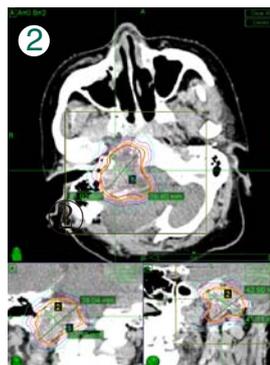


Fig 2&3. CT & MRI, coronal, axial and sagittal view of the treated area, as well as radiation dose, shown in multicolored isodose lines.

The residual tumor volume shrank 70 percent after the SRS. In a two-year follow up, no enlargement or recurrence was seen and no neurological deficits were found. The patient continues to enjoy good quality of life post-treatment.



Fig 4. Follow up MRI, tumor shrank remarkably.

Benefits of CyberKnife Treatment

The jugular foramen involves important neurovascular structures and bone at the cranial base. Despite advances in neuroimaging, microsurgical techniques and modern skull base surgery, complete removal of jugular foramen Schwannomas remains challenging. One of the potential dangers is cerebrospinal fluid leakage. Postoperative cranial nerve injuries are even more common: up to 90 percent involve cranial nerves. And some research indicates the volume of residual tumor correlates with tumor recurrence. CyberKnife SRS is an option for patients with residual or recurrent tumors and those who are medically unfit for surgery (e.g. senile patients), with higher long-term control rates of tumor volume, lower cranial nerve dysfunction lower morbidity than traditional surgery. Thus, patients' post-treatment life quality can be improved significantly.

“The use of CyberKnife has provided a good treatment option for our patients and reduced the pain they suffer.”

– Dr. En-min Wang, Huashan Hospital, Fudan University

Important Safety Information: Most side effects of radiotherapy, including radiotherapy delivered with Accuray systems, are mild and temporary, often involving fatigue, nausea, and skin irritation. Side effects can be severe, however, leading to pain, alterations in normal body functions (for example, urinary or salivary function), deterioration of quality of life, permanent injury and even death. Side effects can occur during or shortly after radiation treatment or in the months and years following radiation. The nature and severity of side effects depend on many factors, including the size and location of the treated tumor, the treatment technique (for example, the radiation dose), the patient's general medical condition, to name a few. For more details about the side effects of your radiation therapy, and if treatment with an Accuray product is right for you, ask your doctor.