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## **The Best Minimally Invasive Route For Brain Tumor Surgery**

### ***Endonasal, Eyebrow Approaches Optimal for Different Tumors, Study Shows***

**Santa Monica, CA – April 13, 2009--** A landmark study by neurosurgeons at John Wayne Cancer Institute and Saint John's Health Center is giving brain surgeons the edge in planning delicate operations. The study focuses on two minimally invasive "keyhole" approaches used to remove brain tumors: operating either through a nostril (endonasal transsphenoidal route), or through an eyebrow (supra-orbital route). Both approaches have benefits over traditional large craniotomies (open-skull surgery), but choosing the best strategy for a particular patient hasn't been an easy call. Now, the first comparative study of these two approaches offers neurosurgeons some guidance. The study, "Endonasal versus Supraorbital Keyhole Removal of Craniopharyngiomas and Tuberculum Sellae Meningiomas," appears in the May 2009 issue of *Operative Neurosurgery*.

Minimally invasive approaches are increasingly used to remove many types of brain and skull base tumors. The endonasal route eliminates the need for either a facial or scalp incision, while the eyebrow route requires only a small incision. Compared with traditional craniotomies, both involve far less bone removal, brain exposure and brain retraction, typically resulting in a faster patient recovery and excellent neurological outcome.

Over eight years, neurosurgeons tracked patients who were operated on using either the endonasal transsphenoidal or the supraorbital route to remove craniopharyngiomas and meningiomas, two types of benign brain tumors that arise in the skull base area near the optic nerves and pituitary gland (the "master gland" for hormonal function).

Craniopharyngiomas affect both children and adults, and although they are considered benign (noncancerous) they can become quite large (over 5 cm). If they interfere with intracranial blood vessels, nerves and the pituitary gland, these tumors can cause serious problems including visual loss and hormonal dysfunction. Meningiomas, the most common benign brain tumor, typically occur in adults. About 5 percent behave aggressively, more like a malignancy. A variety called tuberculum sellae meningiomas

can compress the optic nerves, causing visual loss, and can surround critical blood vessels such as the carotid arteries.

A total of 22 patients with craniopharyngioma and 21 patients with meningioma were treated with one surgical approach or the other (in some cases, both). An analysis evaluating the completeness of tumor removal, visual recovery and occurrence of post-surgical complications suggests the endonasal route is ideal for most craniopharyngiomas, especially those located behind the optic nerves. The supra-orbital route is preferred for larger meningiomas (over 3 cm in size) and those that grow beyond the carotid arteries.

“With recent advances in micro-instrumentation, endoscopy for visualization and computerized surgical navigation, keyhole approaches are often used to remove brain tumors traditionally requiring much larger, more extensive craniotomies,” said Daniel F. Kelly, M.D., Medical Director of the Saint John’s Brain Tumor Center, faculty member at John Wayne Cancer at Saint John’s and senior author of the study. “Going through the nose or eyebrow gives surgeons two very different minimally invasive routes to reach the same intracranial region.”

“Until now, no one had done an ongoing comparison of these two approaches,” Dr. Kelly continued. “Our experience suggests that in many cases, either route can be used, but for particular tumor types, the eyebrow route has advantages over the endonasal, and vice versa. We found that most craniopharyngiomas can be approached from below, through the nose, while large meningiomas are best approached from above, through the eyebrow.”

“Both of these minimally invasive approaches typically yield excellent results with rapid recovery,” he continued. “Ultimately, surgeon experience and the specific tumor anatomy will be the deciding factors in choosing the best approach.”

With these brain tumor patients, Dr. Kelly explained, the surgeon’s goal is to remove the tumor as completely as possible, to restore vision and preserve pituitary hormonal function with an acceptably low risk of complications. But operating through such small anatomical corridors requires significant skill that can only be gained by practical experience. “The reality is that these are technically demanding procedures with a high level of potential risk. Relatively few neurosurgeons are performing them both routinely,” he noted. “We hope our findings will help surgeons and their patients by offering them useful guidelines on the capabilities and limits of each approach for these tumors.”

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#### **John Wayne Cancer Institute**

Since 1981, the John Wayne name has been committed by the Wayne family to groundbreaking cancer research and education in memory of their father, who died of cancer. The John Wayne Cancer Institute at Saint John’s Health Center has received worldwide acclaim for advances in melanoma (skin cancer), breast and colon cancer as well as for immune therapy of cancer. Other areas of research include prostate and liver cancer. With its unique ability to rapidly turn scientific

breakthroughs into innovative approaches to treatment and early detection, the JWCI provides immediate hope to cancer patients around the globe. For more information, visit [www.jwci.org](http://www.jwci.org)

**Saint John's Health Center**

Since its founding in 1942 by the Sisters of Charity of Leavenworth, Saint John's Health Center has been providing the patients and families of Santa Monica, West Los Angeles and ocean communities with compassionate, advanced medical care. Saint John's provides a spectrum of treatment and diagnostic services with distinguished areas of excellence in cancer care, cardiac care, orthopedics, women's health and specialized programs such as the internationally acclaimed John Wayne Cancer Institute. Saint John's Health Center is dedicated to bringing to the community the most innovative advances in medicine and technology.

**Brain Tumor Center**

The Brain Tumor Center at Saint John's Health Center provides comprehensive care, minimally invasive surgery and support for patients with brain tumors, skull base tumors and pituitary adenomas. [www.brain-tumor.org](http://www.brain-tumor.org)

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