Guest Editorial

Skull-base surgery: a perspective

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During the past decade there have been important developments in the treatment of patients with skull-base tumors. Many factors have contributed to these advances including improved diagnosis with magnetic resonance imaging, advances in interventional neuroradiology, the application of microsurgical techniques, the development of the team concept with cooperation of neurosurgeon, otolaryngologist, and plastic surgeon during surgery, improved postoperative care, and the cooperation of the radiation therapist and neurosurgeon in planning radiosurgery. We now have journals and societies specializing in the skull base, and the topic is included in the programs of most neurosurgical meetings.

The development and use of these technical accomplishments for skull-base tumors impose a major responsibility on physicians caring for these patients. It is imperative that the physician carefully consider what is the best treatment option to recommend to a patient with a skull-base tumor. Should the patient have surgery, radiation therapy, a combination of therapies, or no specific treatment but careful follow-up monitoring with periodic scans and clinical evaluations? Should surgery be a biopsy, subtotal removal, or a plan for complete removal which may include endovascular treatment and multiple procedures? If radiosurgery is to be part of the treatment program, should it be conventional fractionated therapy, gamma knife, linear acceleration, or proton beam using single-dose or fractional techniques? If the patient is to be followed, how often should the re-evaluation be performed?

How does the physician choose from among these options the treatment program best suited to the individual patient? Initially, the physician should take the patient’s history directly and not rely on the interpretation of someone else’s notes. A first-hand account of the symptoms, what the course of those symptoms has been, and how those symptoms are affecting the patient’s life should be obtained. There should be an objective assessment of any neurological deficit. Radiographic studies should be carefully reviewed to be sure they are adequate and to decide if any additional studies are needed.

Having acquired this information, the treatment options can be considered. In some patients there is little doubt as to what should be done and the physician readily settles on the best option. However, in many patients the decision may be difficult. How does one come to a decision? The physician must have up-to-date knowledge about both the natural history and the treatment alternatives if the patient is to receive the best advice. This means regular reading of appropriate books and journals, attendance at postgraduate courses, lectures, and the annual meetings of our national societies, the use of audio and video tapes, computer searches of the literature, and discussions with informed colleagues. With this background information, one can begin to weigh a specific treatment option against whatever knowledge one possesses or thinks one possesses about the natural history of the illness. Unfortunately, much of our knowledge about the natural history may be anecdotal and subjective. Then one needs to consider the impact of the treatment option on the patient’s life utilizing one’s knowledge, or at least one’s impression, as to what are the immediate and long-term results of the treatment being recommended. Will any treatment improve the symptoms? What is the chance that further progression or recurrence of the tumor can be prevented? What are the risks of the treatment? Do the potential long-term benefits justify these risks? It is important to discuss with the patients their own hopes and expectations from the treatment program.

In this issue of the Journal of Neurosurgery, Dr. Sekhar and his colleagues report their experiences with the surgical management of 20 patients with temporal bone neoplasms. This group has been one of the leaders in applying microsurgical techniques to skull-base lesions previously thought to be inoperable. Al-Mefty’s
has also reported on the technique of extensive resec-
tion of these tumors.

While technical achievements are well documented, the use of intraoperative neurophysiological moni-
toring, including electroencephalography, somatosensory
evoked potentials, brain-stem evoked responses, and
at times cranial nerve testing, is only briefly mentioned.
Monitoring can be helpful but it is expensive. Müller, who is from the same institution as the authors, has
published extensively on intraoperative monitoring.
However, this report does not indicate how these tech-
niques were helpful during the operation. Did the re-
sults of monitoring alter the course of the operation?
Could the serious temporal lobe problems have been
recognized and prevented by changing the monitoring
techniques?

Was any patient made better by the operation? From
a symptom standpoint, probably not. From an overall
functional standpoint and with apparent complete re-
moval of the tumor, some patients were probably better off for having had the procedure. We do not know if
the seven patients who had pain as a presenting symp-
tom were relieved or if others had new pain, but it
would appear that nearly every patient had at least one
new cranial nerve deficit. Four patients presented with
a facial nerve palsy, and 17 had this deficit postopera-
tively. In 12 patients a graft was needed, which means
that the best recovery that could be expected is to a
House Grade III facial function level. The criteria for
this grade are an obvious but not disfiguring difference
between the two sides, normal symmetry and tone at
rest, slight to moderate movement of the forehead,
complete eye closure with effort, and a slightly weak
mouth. Six patients presented with hearing loss and all
had this deficit postoperatively. If the patient has a high
probability of being cured of the tumor or of having a
useful life significantly lengthened or more serious dis-
abilities relieved, then the loss of facial nerve function
and hearing is acceptable. On the other hand, the loss
of ninth and 10th cranial nerve function is one of the
most serious neurological disabilities for a patient.
In this series, one patient presented with this disability
and eight had postoperative loss of this function requiring
tracheostomy and gastrostomy. There is a real question
as to whether one should electively give this disability
to a patient.

What can be concluded about the place of radical
resection of the temporal bone for tumor? With rare
exceptions, this type of surgery should not be done in
patients with rapidly growing malignant tumors. The
authors describe the results as dismal. A procedure that
is likely to cause a severe disability (particularly the loss
of ninth and 10th nerve function) for much if not all
of the patient’s remaining life, often requiring addi-
tional operations, and does not cure the tumor is not
indicated. Previous publications on the treatment of
these tumors indicate that even extensive disease which
is not totally resected by piecemeal and function-saving
procedures followed by full-course radiation therapy
results in a survival rate at least as good as if not better
than radical en bloc resection. For patients with
slow-growing malignant tumors or meningiomas there
will be a place for this surgery if there is a good
probability of limiting the postoperative deficits to the
loss of seventh and eighth nerve function and the long-
term results document arrest of the tumor growth.

Those groups treating patients with skull-base tumors
should continue to develop their techniques but should
also carefully report their indications for therapy, the
immediate results, and the long-term follow-up findings
not only of surgically treated patients but also of those
who are followed and those treated with different types
of radiotherapy. Only in this way will we continue to
focus on our primary goal of recommending what is
best for the patient.

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