Chapter 2
Errors in Thought About Adult Brain Surgery

Here, I will explore specific errors in regard to adult brain surgery decision-making and the pertinent review of published scientific studies.

"This Is How I Was Trained"

This is one of the most common arguments that a neurosurgeon will use to justify the decision to perform adult brain surgery and the specifics of the operation they have chosen to perform. But the flaw in this argument is clear. Just because someone else was doing something a certain way does not prove or establish anything. It may be that the teacher or professor was doing something that was the second-best possible way of treating a certain problem, for whatever reason. It may be that the instructor was doing something the best possible way, at that time, but a few years later, a better treatment became available or became more apparent. Oddly enough, people will make this argument 10, 20, or even 30 years after they were trained, even though the discipline has rapidly changed since then.

"I Have Seen Patients Do Well After This Surgery"

This argument again is not definitive evidence. The patient may have done well without the surgery. The patient may have done well because of something else besides the surgery. The patient may have done well with a much more limited operation. The patient may have done well with some less invasive treatment that did not involve surgery. The patient may have done well because of a placebo effect. The patient may have done well immediately after surgery, but 3 months later may have had serious problems. Observing that one or more patients do well after an

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operation in no way establishes that that operation or any operation was clearly necessary.

"The Patient Wanted the Surgery"

In this scenario, the proposed justification for a particular brain operation is that the patient themselves "wanted" the brain operation. First, people only really want a brain operation that is likely to help them. Second, people will usually only agree to an invasive brain procedure if they are presented with no reasonable alternative. Third, the patient is no expert on brain surgery. As such, a surgeon should not justify an operation with the argument that "the patient wanted the surgery."

A variant on this concept, for patients who cannot make their own decisions, like debilitated patients or minors, is "the family wanted the surgery." Obviously, this is just the same argument and not in itself a valid reason to proceed with surgery.

"The Family Wanted Everything Done"

This incorrect argument arises, usually in an emergency situation in which the extremely unfortunate patient is unable to make their own decisions, and brain surgery is performed with the justification that "the family wanted everything done." It could also be that the family wants "everything done" because they believe this is what the patient would have wanted. But this is just a variation on the theme of "the patient wanted the surgery." Clearly, the family would want brain surgery for their loved one "if there was evidence that it would help." But the family is in no position to know that answer, even with a thorough internet search. It is the brain surgeon's job to inform the family about whether surgery is or is not indicated.

This is not to say that different patients may indeed have different preferences, and some may be more willing to live with significant disabilities than others. Nonetheless, it should be the brain surgeon who is guiding most of the decision-making and informing the family of what surgery would or would not generally be helpful for their unfortunate family member. A surgeon should not justify an otherwise pointless operation with the argument that "the family wanted everything done."

"We Have Nothing to Lose by Operating"

This argument is usually made in some desperate situation in which surgery would not normally be advisable, and the surgeon reasons that "we have nothing to lose by operating." These scenarios include both the suddenly devastated but hopeless patient, as well as the patient with chronic severe disability with a very poor quality

of life. But this same argument could be used to justify any operation in any hopeless situation. The issue should be "is there evidence that there is clearly something to be gained from the operation," not simply that the situation is so dismal that an operation will not make matters any worse. It is also very common in these hopeless situations that a few days after the brain surgery, a "serious" discussion takes place with the family and palliative care is instituted. Clearly, this discussion could have just as easily taken place before the surgery and avoided a pointless operation.

"Surgery Is Not Clearly Worse Than the Alternatives"

There are circumstances in which this may well be the case. There may well be no study or definitive evidence that surgery is worse than other known alternatives. But is that really an adequate justification to operate on the brain? Given the obvious risks involved, the real standard for performing adult brain surgery should be strong evidence that the procedure is clearly better than other alternatives, not just that it is not clearly worse.

"We Were There Anyway"

This argument involves an operation that may well have had legitimate indications, which then becomes coupled with other procedure(s) for different purposes or of a more prophylactic nature performed in the same general vicinity with the justification that "we were there anyway." These "secondary" procedures would not have been justified on their own and only add risk to the primary operation. Yet many surgeons will often justify such procedures with the argument that since we were already working in that area, adding some other procedure was theoretically acceptable. This is usually not the case, and such additional work just adds risk to the primary surgery.

"The Brain Issue Was the Presenting Problem, Therefore We Should First Perform Surgery on the Brain"

This argument is just not correct. For example, a neurosurgeon is consulted to evaluate a patient who had a seizure, and a CAT scan demonstrates what looks like brain metastases. An MRI confirms this suspicion, and the neurosurgeon operates on one of the tumors to make the diagnosis. Again, the fact that the brain problem was the presenting problem in no way argues that it should be surgically addressed first or at all. The more reasonable course would have been to start the patient on a seizure

medicine (like Keppra), and some steroids if there were edema (like dexamethasone), and to perform a CAT scan of the chest, abdomen, and pelvis. If a large lung mass was found, a bronchoscopy might well yield a diagnosis without any brain surgery, and the brain metastasis or metastases could be treated with radiosurgery or standard radiation.

"Brain Surgery Should Be Performed Because There Is Brain Edema or Mass Effect"

This argument usually reasons that there is brain edema or mass effect, and that if this is not promptly addressed with surgery, these features will progress and lead to serious neurological symptoms or brain herniation and death. This argument is also frequently not correct. For example, brain metastases will often have edema yet rarely will benefit from open surgery. Steroids and radiation/radiosurgery are the mainstay of management for brain metastases. The steroids can often be quickly tapered after radiation treatment.

"We Need an Invasive Diagnostic Procedure"

This is generally a call for a cerebral angiogram or other procedure that carries small but real risks. Again, while such procedures may well have been "standard" years ago, now, in the age of CT, MRI, CTA, CTV, MRA, and MRV imaging, these invasive diagnostic procedures are often not necessary. And the risk of angiography is real, potentially very serious, and not zero.

"We Need Tissue"

This assertion is made very frequently as a justification for brain surgery, when, in fact, there is rarely a need for "tissue" in order to care for the patient. Most of the time, the diagnosis is clear from the imaging or history (such as a known history of active systemic malignancy). In some select cases (e.g., some gliomas), it may be appropriate to obtain diagnostic tissue if that can safely be done. But that is the exception. The request for "tissue" is often made by non-surgeons, and the brain surgeon will claim justification for operating because these other specialists wanted the surgery performed.

"The Tumor Board/Trauma Board/Stroke Board Recommended Surgery"

This may involve the request for an unnecessary diagnostic procedure or the unnecessary obtaining of lesional "tissue," but it can also involve more extensive procedures such as brain tumor removals, brain hematoma evacuation, decompressive craniectomy, and so on. The obvious problem here is that these boards are filled up mostly with people who do not specialize in neurosurgery and are just not in the best position to make recommendations about brain surgery. Usually, most members of these boards have never met the patient and have no neurosurgical training. Operating merely to satisfy such committees will not improve outcomes.

"We Need To Do This Procedure to Satisfy Certain Volume Requirements"

This is one of the most cynical arguments. For example, an argument is made that the hospital needs a certain number of annual mechanical endovascular thrombectomies for stroke to maintain its stroke center designation, so, even though a particular patient is probably not a good candidate, the surgeon or interventional neuroradiologist should perform the procedure anyway, for the good of the hospital. Or the hospital needs to put in a certain number of intracranial pressure monitors (or "bolts") to maintain its trauma center designation, so the surgeon should put such a brain monitor in a patient, even though it is unlikely to be helpful, for the good of the hospital and the overall program. It is obvious why brain surgery to satisfy this and only this criterion is not likely to be helpful.

"This Is What Was Said at a National Conference"

National conferences are held periodically, and certain neurosurgeons will present on a brain surgery topic they are experienced with. But any such presented recommendations cannot be determined to be "the best possible recommendations" simply because they were given such a forum for presentation.

Surgeons who are doing things a certain way will be much more likely to invite other surgeons to speak publicly who share their views, and surgeons who do speak publicly will also want to present their work in the best possible light. Suffice it to say, that an attendee at a given conference who subsequently performs a recommended procedure is in no way guaranteed to see comparable results.

"This Patient Is a Very Important Person (VIP)"

In some cases, a surgeon will justify an operation with the argument that this particular patient was an unusually important person, whether because the patient (or the patient's relative) was a doctor or nurse or hospital administrator, or politician or famous person, and so on. The surgeon seems to acknowledge that had the person been a "regular" person, they would not have operated, but given the special status of this individual, they thought that operating was somehow the best thing to do. The suggestion seems to be that a more important person or their family will be more appreciative of what appears to be a more aggressive approach in a circumstance when such surgery would not otherwise be offered. Again, this argument is unsound. Furthermore, a VIP and their family will likely be more appreciative of an honest assessment and treatment based on scientific evidence than a brain operation that is otherwise unnecessary.

"This Is How Everyone Is Doing Things"

This argument proposes to justify a particular indication for brain surgery by suggesting that many or most other people are performing the same operation for similar indications. It may well be that if a lot of people are performing a particular operation for a particular reason, it is a good idea. But it certainly is not definitive evidence, and the reality is that brain surgery indications have been rapidly evolving. As such, one cannot argue that some operations must be appropriate just because lots of other surgeons are performing such an operation.

Now the reality is that every possible aspect of every possible intervention can never be studied, and it is not unreasonable to point to what most reasonable people believe about something. But such "general sentiment" cannot override solid scientific data and is not strong evidence in itself.