



Overall Positioning Considerations for Intracranial Procedures

6

Adam Arthur

Patients undergoing cranial neurosurgical procedures expect and deserve an expert team that will see them safely through one of the most dangerous and anxiety provoking days of their lives. The team that provides this service and the manner in which it will be done vary greatly from institution to institution and from day to day. While good results can be obtained under a variety of different circumstances, there are some uniform truths that we may observe.

At one extreme on this spectrum are the cases where positioning is not difficult or greatly important. When the pathology of interest lies on the cranial convexity and is therefore easily surgically accessible, the positioning of the patient is straightforward. This is true of most emergent cranial procedures. The team generally can expect that the bed will not be tilted a great deal, and operative times are usually shorter. In these cases, patients are generally positioned supine and the operating table can be left flat. Simple padding of pressure points is sufficient.

On the other extreme, there are cases where the pathology is deep and surgical exposure, operating and closure is expected to take more time and effort. Sometimes these cases involve minimally

invasive approaches to safely allow operating at a depth through a smaller opening. On other occasions, these cases require extensive skull base approaches or delicate microsurgical work. These cases require more planning and positioning becomes a significant and critical endeavor.

At greater depths from the skin surface, brain retraction becomes an important consideration. The surgeon must consider how to facilitate the egress of spinal fluid to facilitate operations in the subarachnoid space. Brain retraction should be minimized or avoided and proper positioning often allows gravity to assist in opening a safe and adequate surgical corridor. With any turning of the neck, the surgical team must avoid compression of the jugular veins and concomitant bleeding. Exposure and control of vascular structures is almost always a consideration for these surgeries, multiplying the concerns that must be taken into account.

For these cases often the operating table may need to be tilted over a greater range of angles which makes it more difficult to ensure that pressure is distributed evenly over the surface of the patient's body. Longer cases also increase the stress on the operating surgeon, who must consider the biomechanics of positioning themselves and their assistants in addition to the patient. The dexterity and stamina that is required of surgeons for these procedures are certainly significant, but hard-won experience and careful planning are arguable of greater importance.

A. Arthur (✉)
Semmes-Murphey Neurological and Spine Clinic,
University of Tennessee Health Sciences Center,
Memphis, TN, USA
e-mail: aarthur@semmes-murphey.com

While surgeons usually have some degree of control over their own approach to an operation and over who might be available to assist, the same cannot always be said for all aspects of operating room care. Under budgetary pressure, hospitals usually cannot provide everything a surgeon might want for positioning and operating on complex cranial cases. Surgeons rarely have complete control over what anesthesia providers will present. Busy operating rooms are increasingly staffed by an array of different professionals, with differing amounts of training and experience. Nowadays many surgeons do not know who will arrive to provide anesthesia for a given patient. Even when the surgeon can choose their anesthesia personnel for the start of a case, these personnel often change several times during a single craniotomy.

Under these circumstances, the responsibility for patient positioning and for any complications

related to positioning is not always clearly delineated. In a busy operative environment, anesthesia providers may not always examine patients carefully during the postoperative period. Pressure ulcers and other complications are not often immediately apparent in the operating or recovery rooms. If a positioning-related complication does occur, who is responsible for discussing this with the patient and their family? Who is responsible for ensuring that the patient understands what has occurred and that they receive the best treatment for it? While it is beyond the scope of this work to mandate specific policies in these areas, they are certainly due careful consideration.

The following chapters review cranial neurosurgical positioning considerations and provide specific guidance and illustrations. It is hoped that this material is of use to doctors, nurses, technologists, and others who seek to perform safe cranial neurosurgical procedures.