

Treating the Neurosurgical Patient: Beyond the Pathology and Technology

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There has been great progress in the treatment of patients with neurosurgical disorders over the past few decades. For instance in the field of neurosurgical oncology the use of technologies such as neuro-navigation¹ and intra-operative magnetic resonance imaging² has enabled neurosurgeons to optimize and maximize the resection of intracranial tumours. A better understanding of the molecular neuropathology of the excised tumour tissue, including the identification of biomarkers, now guides adjuvant therapies and aids in prognostication^{3,4}. Diagnostic biomarkers are used in the evolving classification of brain tumours, prognostic biomarkers can inform about the natural history of a tumour, while predictive biomarkers help assess the probability of a tumour's response to a specific therapeutic regimen. Examples of biomarkers include the 1p and 19q chromosomal deletion status in oligodendroglioma³ and the promoter methylation status of the O(6)-methylguanine-DNA methyltransferase (MGMT) gene in glioblastoma multiforme⁴. Thus the neurosurgeon is involved in the treatment of the patient not only by attempting safe maximal resection of the brain tumour but by providing adequate tissue for biomarker analysis to guide subsequent therapeutics and prognostication.

A better understanding of pathology and progress in technology has also occurred in other neurosurgical subspecialties. Neuro-endovascular techniques have significantly altered the treatment paradigm for patients with intracranial aneurysms and carotid artery disease^{5,6}, new methods and materials for instrumentation have impacted the treatment of patients with spinal disorders⁷, a better understanding of cerebral spinal fluid dynamics and neuro-endoscopy has provided more options for the treatment of adults and children with hydrocephalus^{8,9} ... the list goes on ... indeed making it more challenging for both the neurosurgical resident and the general neurosurgeon already in practice to keep on top of all the advances.

But what about the patient? Despite the pathological and technological advances the neurosurgical patient remains the focus of treatment and not a great deal has been studied regarding the impressions and concerns of the patient in the midst of his or her neurosurgical care, whatever the underlying disorder may be. The manuscript entitled "Gender, patient comfort and the neurosurgical operating room", which is published in this issue of the Canadian Journal of Neurological Sciences, looks at a component of this neurosurgical care, specifically that which occurs within the operating room¹⁰. The article is one of from a series by Dr. Mark Bernstein and co-workers from the University of Toronto. These articles are derived from what is known as qualitative research¹¹, a methodology that is not particularly familiar to neurosurgeons and other neuroscientists, but is well suited to studying patients' perceptions of their treatment. It can also be used to study the

perceptions and concerns of neurosurgeons and neurosurgical residents that are involved in patient care.

In the current article a qualitative case study methodology was employed, using semi-structured face-to-face interviews with 20 patients who had undergone cranial or spinal neurosurgical procedures.¹⁰ Analysis of the interviews revealed nine themes: 1) perception of the intra-operative environment varies between men and women; 2) lacking awareness about observers is anxiety provoking for women; 3) being unaware of the hands-on involvement of students is a concern for all patients; 4) disclosure of implantation of foreign and permanent materials into patients is important; 5) catheterization is anxiety provoking for women; 6) pre-operative menstruation screening may minimize embarrassment for women; 7) patients perceive extraneous conversation as a distraction for surgeons; 8) patients trust their surgeon; 9) there is a relationship between interviewer gender and patient comfort in the interview.

Understanding what goes on in the operating room during a neurosurgical procedure is important to patients. Many patients are unaware that there may be people present during their operation other than their own staff surgeon, anaesthesiologist and relevant nursing staff. Furthermore they are often unaware what the role of these other people may be. In this article the role of medical students during surgery was explored.¹⁰ Most patients were surprised at a medical student's potential involvement in what some medical personnel might consider relatively superficial aspects of a neurosurgical operation, such as suturing of skin during the closure or performing a burr hole. Most patients wished to be informed pre-operatively regarding a student's role, and knowing that the staff surgeon was adequately supervising the student was the most important factor in relieving the patient's anxiety.

Other articles have explored the perceived role of surgical residents in the operating room¹²⁻¹⁴. Knifed et al assessed the level of knowledge that patients had regarding residents and resident training¹². They found that a majority of patients had little or no knowledge about residents and their role and were unaware of the extent to which residents would be involved in the surgical procedure. However, despite this lack of knowledge, there was patient trust in their surgeon and in the health care system, and any anxiety regarding the presence and involvement of residents was low. Another study, in which practicing neurosurgeons were interviewed, showed that staff surgeons do not voluntarily inform patients about resident involvement in operations but that these surgeons recognize the trust that patients place in them¹³. In a more recent article, surgical residents themselves were interviewed and felt that patients were rarely well informed about their role in the patients' care, but that despite this, they were able to develop good relationships with patients¹⁴.

The current article also explores patients' perceptions of the presence of observers such as hospital administrators or surgical company representatives in the operating room.¹⁰ Again, most patients were not aware of this possibility and desired to be informed of the presence of observers. Male patients were more comfortable with the presence of observers than female patients, but all patients believed that observers should not be present during patient exposure and positioning unless it was directly relevant.

Gender differences also became apparent when questions regarding bladder catheterization were explored. Many female patients were unaware about the possibility of catheterization for surgery and half of them wished to be informed pre-operatively if it were necessary. Both men and women's foremost priority regarding catheterization was the health care practitioner's experience and ability, while gender-concordance in catheterization was more important for women than it was for men.

Another area in which disclosure was deemed to be important was when foreign and permanent materials were to be used during surgery. Many patients were surprised that metal implants were used to reattach bone flaps and that dural grafts might be required during an operation. Both male and female patients wished to be informed about these possibilities pre-operatively, though once again they relied on the staff surgeon's expertise to pick the best and most appropriate materials.

An important theme that emerged from this article, which has been noted previously, is that patients trust their staff neurosurgeon, and by extension trust in the health care professionals associated with that individual and involved in their care^{12,13}. Confidence is very important in alleviating patient anxiety. This trust and confidence is not to be taken lightly and not to be taken for granted. Neurosurgeons can do a better job in informing patients about aspects of the operating room environment, which in turn may provide patients with a sense of control that may help to alleviate their anxiety. Better communication between patients, surgeons, anaesthesiologists, residents, medical students, nurses and other operating room observers is likely to improve patient care or at least the patient's perception of it, and may even improve clinical outcome^{15,16}. As with other aspects of health care, surgical care is increasingly incorporating a team construct that includes many different team members. Most patients are willing to accept the team concept of care, but are more likely to do so if well prepared and educated pre-operatively. It is acknowledged that in today's resource challenged environment, neurosurgeons and other members of the surgical team may not always have as much time to spend providing patients with the information that may be of importance to them. It is often difficult for a neurosurgeon just to keep abreast of the expanding knowledge base pertaining to neurosurgical disorders and to keep learning the technological advances required to perform effective operations, all while running a busy neurosurgical practice with on-call and often academic requirements. Yet, a small amount of time spent talking to patients before their surgery may go a long way in helping to alleviate their anxiety, to maintaining their trust in the neurosurgical team, and perhaps even to improving their surgical outcome.

Joseph F. Megyesi
London, Ontario, Canada

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