Reducing medical errors: an essential aspect of neurosurgical practice

MICHAEL G. FEHLINGS, M.D., PH.D., F.R.C.S.C.

Krembil Neuroscience Center, Toronto Western Hospital and Division of Neurosurgery, University of Toronto, Ontario, Canada

Since the publication of the Institute of Medicine’s report on the quality of health care, “To Err is Human,” there has been intensified focus on the incidence and prevention of errors in medical practice. Leape and colleagues have classified medical errors as diagnostic, treatment related, preventative, or other. Although most errors are not related to surgical treatment, surgeons have nonetheless been proactive in finding ways to reduce perioperative error.

The concept of achieving technical excellence and superior clinical outcomes lies at the heart of general neurosurgical and spinal surgical practice. Indeed, when Harvey Cushing started grappling with brain tumors surgically, the mortality rate was 80%. He reduced this rate to 13% over the next 20 years, and it has been further reduced to below 1% in the early 21st century.

Despite these successes, it is clear that neurosurgeons must remain vigilant to reduce perioperative errors. Stone and Bernstein recently evaluated the incidence of error in one surgeon’s practice. The most common errors were technical (27.8%), contamination related (25.3%), equipment related (18.2%), or delays (12.5%). Of the errors, 22.6% were considered major and 77.4% were minor, with 2.7% of errors substantially affecting the clinical course of the patient. Of all errors, 78.5% were deemed preventable.

Our spinal unit has developed a prospective database to track perioperative adverse events with the view of finding preventable factors. In a recent paper, we reported that the overall incidence of intraoperative adverse events was 14% (98 of 700 procedures). Twenty-three adverse events led to postoperative clinical sequela, for an overall intraoperative complication incidence of 3.3% (23 of 700 procedures). The importance of tracking adverse events or errors was emphasized in this issue of the Journal of Neurosurgery by Jhawar et al.

In their paper in this issue of the Journal of Neurosurgery, Jhawar et al. emphasize the need for rigorous protocols to minimize perioperative error in neurosurgery. These authors used a survey of Canadian neurosurgeons to determine the incidence and possible determinants of incorrect-site surgery (ICSS) as related to craniotomies, cervical disc operations, and lumbar discectomies. Despite the inherent limitations of this type of methodology, in which only 68% of surgeons provided data, some valuable insights are provided. Responding neurosurgeons performed 4695 lumbar discectomies, 2649 cervical disc procedures, and 10,203 craniotomies. Based on these data, the authors estimated the incidence of wrong-level (or wrong-sided) lumbar, cervical, and cranial surgery to be 4.5, 6.8, and 2.2 occurrences per 10,000 operations, respectively. The responders recognized fatigue, unusual time pressure, and emergent operations as factors contributing to errors related to cranial surgery, in particular. For spine surgery, unusual patient anatomy and failure to verify the operative site with radiography (for lumbar procedures, in particular) were commonly reported.

Jhawar and colleagues emphasize the importance of minimizing the incidence of ICSS, which is also underscored by the Joint Commission on Accreditation of Healthcare Organizations Sentinel Events Program (as reviewed by Wong and Watters). The importance of intraoperative confirmatory radiography in spine surgery, time-outs to confirm the surgical plan, and marking the site of surgery, with verification by the team, are evidence-based approaches to minimizing ICSS. The paper by Jhawar et al. serves to emphasize these important principles. This paper should stimulate all neurosurgeons to reflect on the critical importance of maximizing patient safety and minimizing perioperative error. These principles, embodied by the legacy of Cushing, reflect the essence of neurosurgical practice.

References
RESPONSE: We thank Dr. Fehlings for his thoughtful comments. Wrong-sided cranial or wrong-level spinal surgery is among one of the most feared neurosurgical errors. Surgeons are reluctant to disclose ICSS because of the threat of malpractice lawsuits and criticism from coworkers. Our national survey, with a 75% response rate and 68% completion rate, has one of the highest response rates and represents one of the largest national surveys in the neurosurgical literature. Despite sensational articles in the media, we found that the incidence of ICSS is exceptionally low. Our results suggest that the incidence of lumbar, cervical, and cranial ICSS is 4.5, 6.8, and 2.2 occurrences per 10,000 operations, respectively. Among all responders, 25% admitted to cutting skin on the wrong side of the head, 32% removed a lumbar disc from the wrong level, and 16% reported performing a cervical discectomy at the wrong level. Factors related to wrong-sided cranial surgery were after-hour emergency cases, fatigue, and unusual time pressures to finish a case. Similarly, for spinal surgery, the importance of having appropriate imaging in the operating room was emphasized. Intraoperative localization was also critical in preventing spinal ICSS. For both cranial and spinal ICSSs, surgeons also identified misplaced guest films from transferring hospitals as a potential source of error. Despite the team approach in the operating room, surgeons often take primary responsibility for ICSSs. Unfortunately, this consequence leads to a surgeon’s unwillingness to discuss ICSS openly. Data in our survey suggest that patients were not informed of the error in 15% of wrong-sided and 19% of wrong-level surgeries. Disclosure to the patient is imperative in the event of ICSS, and could ultimately prevent litigation. Correctly identifying the correct side or level should be considered a team matter, with multiple safeguards built into the protocol to avoid leaving the primary responsibility with a single individual. We propose the “ABCD Pause” to incorporate the entire operating room team to ensure correct identification of the side/level of surgery. Ideally, surgeons should be involved in the preoperative confirmation of the level/side and be present during draping of the surgical site. Although ICSS may never be completely eliminated, introducing additional checks may further reduce their incidence. (DOI: 10.3171/SPI-07/11/465)

Neil Duggal, M.D.
Demytra Mitsis, B.Sc.
London Health Sciences Centre London, Ontario, Canada
Balraj S. Jhawar, M.D., D.Sc.
Hotel-Dieu Grace Hospital Windsor, Ontario, Canada