Wrong level

To The Editor: In a recent issue of the Journal of Neurosurgery: Spine, my interest was raised by the article of our Italian colleagues Drs. Irace and Corona (Irace C, Corona C: How to avoid wrong-level and wrong-side errors in lumbar microdiscectomy. Clinical article. J Neurosurg Spine 12:660–665, June, 2010).

As neurosurgeons are used to dealing with major diseases, surgical procedures, and potential complications, the easily correctible wrong-level operation might seem a rare and minor problem; however, from the patient’s point of view, it is not. I am pleased by the attention our colleagues draw to potential problems with routine end-of-day operations. The main danger our surgical society is facing is the drive for cost-reducing efficiency-based medicine. Taking this as a goal of surgical life changes the behavior of treating physicians at the cost of the ancient doctor-patient relationship. Patients are not managed by one responsible doctor anymore, but rather by a hospital or a department. The first available physician can indicate surgery for a patient during the outpatient visit, the second will enroll him or her in a program, the third will actually perform the operation, and the fourth will do the follow-up. This is a large undertaking for the sake of efficiency. In these hectic settings, checks, double checks, and even triple and quadruple checks can be performed, but this method is only a quick fix for the potential dangers introduced by giving up the doctor-patient relationship. Irace and Corona only slightly mention this in their additional considerations: “...one of the crucial factors in successfully performing an elective surgical procedure is to...enter the ‘atmosphere’...this means that...the surgeon...must participate in the positioning of the patient and personally select the diagnostic neuroimages he or she considers necessary for a correct surgery.” If the surgeon is truly willing to take full responsibility for his or her patients, I see no other acceptable way of preparing for surgery.

However, even in this optimal setting, wrong-level operations are not unavoidable. The radiographs obtained prior to operation can still lead to the wrong disc, coming from the superficial layers and searching for the 2-layers-deeper disc. Fortunately, the herniated disc itself will, upon its exposure, inform the surgeon that he or she is at the correct level and side. In cases of minor herniations noted on MR images, or in cases of multilevel pathology, the only true indicator of correct disc surgery is a radiograph with a needle or other marker in the disc space that requires treatment.

I do not think all lumbar surgery should be confirmed by radiography, as this is time consuming and expensive. In experienced hands, only a very small number of wrong-disc approaches would be avoided. The too-liberal use of radiography is a source of iatrogenic pathology itself as any radiologist can confirm. The use of radiography during disc surgery should not be made mandatory, but indeed it should be readily and easily available in selected cases at the request of the surgeon.

WIMAR VAN DEN BRINK, M.D., PH.D.
Isala Klinieken
Neurochirurgische Centrum Zwolle
Zwolle, The Netherlands

Disclosure

The author reports no conflict of interest.

RESPONSE: We thank Dr. van den Brink for his interest in our clinical report. The way he approaches the matter of “wrong-level operation” strongly resembles our way of thinking and the spirit of our report.

First of all, we can never forget the patient and his or her “point of view.” Currently, one of our main formidable tasks is to conciliate budget-based medicine and the need to revitalize the somewhat abandoned “ancient doctor-patient relationship.” In this context, the first difficulty may be encountered in the surgical activity of academic institutions and large hospitals: many patients versus multiple treating physicians and nurses. Dr. van den Brink well depicts the process of assistance to the patient, in which the cardinal steps of indication for surgery, compilation of clinical charts, and elucidation of the informed consent, and the operation itself are performed by different physicians. Although we always keep this process in mind, often not well articulated, the aim of our report was strictly focused on the potential error of wrong-level surgery occurring in the operating room. Our concept of “...entering the ‘atmosphere’ of the operation...” reflects the attention we pay to the behavior of all the actors in the room. Our proposed method is directed to different scenarios: 2 or even 3 surgeons involved sequentially in a lumbar microdiscectomy, as well as a single surgeon performing his or her lighter operation (for example, a lumbar discectomy) at the end of the day. Incidentally, to avoid fatigue or loss of concentration, which have been identified as factors leading to the wrong-level error, in selected instances the planned lumbar microdiscectomy could be scheduled as the first intervention of the morning session. The lesson learned from pediatric neurosurgeons must be remembered: it has been observed that the rate of infection in CSF shunt operations in newborns and high-risk young patients decreased dramatically when surgery was performed at the beginning of the operative session instead of late in the afternoon.

Concerning the second technical point raised by our
Dutch colleague, we think that a wire placed in the spinous process, followed by a lateral fluoroscopy, and left in place (!) is an optimal tool to be driven to the correct “2-layers-deeper disc,” particularly when the superficial dissection is done in a very narrow tubular corridor. Reiterating what we have said, regarding large hospitals in which different physicians are involved in the process of assistance and surgery, we think that our method may be very useful. The assistant surgeon begins the lumbar microdiscectomy, keeping the wire placed in the spinous process, and obtains images under fluoroscopic guidance. The first surgeon, arriving later, will easily recognize if the disc space to be explored is the correct one, and no additional radiographs are required.

Of course, for “multilevel pathology” our method may be not necessary. We point out that our strategy was designed for “a single-level lumbar decompressive procedure” (see Object in the abstract of our paper). Concerning the last point, we partially agree with Dr. van den Brink when he says that he does not think “all lumbar surgery should be confirmed by radiography.” Nevertheless in single-level lumbar procedures, in which the dissection toward the disc space must be as limited as possible to avoid formation of a wide scar; the IRACE (intraoperative radiograph and confirming exclamation) method we have proposed may be very helpful, because it allows a microsurgical procedure to be performed in a very narrow space with a very low risk of operating at the wrong level. For this reason, we wish to stress here once again (repetita iuvant) that every 1-level lumbar surgical procedure starts correctly by means of lateral fluoroscopy performed with a wire placed in the spinous process.

Claudio Irace, M.D.
Hospital Igea
Milan, Italy

References


Please include this information when citing this paper: published online August 12, 2011; DOI: 10.3171/2011.3.SPINE10886.

Minimum clinically important difference


The authors compare the results of laminoplasty versus laminectomy with fusion in a cohort of 56 patients surgically treated for cervical stenotic myelopathy. The comparison is based on the following scores: preoperative and postoperative Nurick grades, modified Japanese Orthopaedic Association scores, neck pain visual analog scale (VAS) scores, and the Odom outcome criteria. Postoperative length of stay, complications, and implant costs were also calculated.

The authors found that although patients who underwent fusion typically had higher preoperative neck pain scores (mean VAS score 5.8 ± 3.2) than patients treated with laminoplasty (mean VAS score 3.2 ± 2.8), their neck pain improved after surgery (mean VAS score 3.0 ± 2.3), whereas there was no significant change in the neck pain scores of patients treated with laminoplasty (mean VAS score 3.4 ± 2.6). Such improvement in neck pain in the fusion group has been considered significant on the basis of the statistically calculated “p value.”

On the basis of such results, the authors conclude that cervical fusion (but not laminoplasty) significantly reduces neck pain in patients with stenotic myelopathy, with the only drawbacks being the associated higher costs of the implants and a higher rate of reoperation.

Interestingly, in the same edition of the Journal of Neurosurgery: Spine, the group from Johns Hopkins investigated, with respect to the lumbar spine, the concept of the minimum clinically important difference (MCID) as a measure for the critical threshold needed to achieve treatment effectiveness. After an extensive and laborious statistical analysis, the authors have been able to define the MCID for patients undergoing transforaminal lumbar interbody fusion (TLIF) for low-grade degenerative lumbar spondylolisthesis with associated back and leg pain. From 4 anchor-based statistical methods for calculating MCID, the authors concluded that calculating the minimum detectable change using the 36-Item Short Form Health Survey (SF-36) health transition index anchor appears to be the most appropriate tool for calculating MCID in such patients.

Based on this method the MCID scores following TLIF were 2.1 points for back pain VAS, 2.8 points for leg pain VAS, 14.9 points for the Oswestry Disability Index, and 0.46 quality-adjusted life years for the EuroQol-5D health survey.

After reading both papers, one crucial question in relation to the paper comparing fusion and laminoplasty for treatment of cervical stenotic myelopathy seems unavoidable: Does the observed neck pain improvement as measured by the VAS score in the patients treated with cervical fusion reach the MCID, proving the supposed superiority of fusion over laminoplasty?

Considering the excellent paper published about the MCID regarding the lumbar spine outcomes scores, it becomes clear that further studies analyzing the MCID for the cervical spine are urgently warranted. To our knowledge, in the only paper in which such values were calculated for the cervical spine, the MCID was defined only for the following questionnaires: the Neck Disability Index, the SF-36 physical component summary, and the Verbal Numeric Rating Scales (VNRS) for arm and neck pain (but not for the VAS). It is already known that, although the VNRS performs as well as the VAS in assessing changes in pain (and both scales seem to be well correlated), patients systematically score their pain higher on the VNRS, with an unacceptably wider distribution of the differences.