CORRESPONDENCE

Results of a neuro-ophthalmological examination are not presented in Chen et al.’s series. The methods section specifies that ophthalmological and neurological evaluations were performed, but the results section reports only the degree of ONP recovery as assessed by neurosurgeons. The technique of examination is not detailed (i.e., objective techniques such as alternate eye cover test at distance or near, subjective measures such as Worth four dot test, etc.). We must call for caution because, in our series, most cases of residual diplopia were not detectable by non-ophthalmologists. Furthermore, incomplete resolution of ONP has been well documented in patients after surgical clipping (2–6).

We think that, whenever possible, patients must be fully and fairly informed of both endovascular and surgical options of treatment, including a fair discussion of possible complications unique to each technique. Such complete consultations should include mention that cure of diplopia is not the main goal of treatment. After both endovascular and surgical clipping, most patients enjoy resolution of diplopia in primary gaze. Slight diplopia in down gaze (when reading) can occur with endovascular clipping and probably with clipping too but should not be compared with the possible neurological complications of SAH or complications of surgery, and it cannot be included in the major considerations involved in choosing between methods of treatment. Down gaze diplopia can easily be corrected with reading glasses fitted with prisms.

Hadas Stiebel-Kalish
Harry Z. Rappaport
Petah Tikva, Israel


In Reply:
We appreciate the letter from Drs. Hadas Stiebel-Kalish and Harry Z. Rappaport concerning our study published in Neurosurgery in June 2006 (1). The ocular mobility examinations used in our study were as follows. First, the palpebral aperture was measured with eyes looking straight ahead, looking up, and looking down. Next, ocular alignment was determined by examining pupillary light reflection while the eyes were in the primary position and looking at a light source. Afterward, distance and near alternate-cover tests were performed. The results of the test were summarized in Table 1 in our article.

What differentiates our study are the two demographically comparable groups of patients who underwent clipping or coiling. Both were evaluated by the same criteria, and the outcomes of ONP were compared directly. Our primary intent was to shed some light on a question that many neurosurgeons and neuroradiologists have asked for a long time, namely, which treatment modality (surgical clipping or endovascular coiling) offers the higher possibility of recovery from ONP? As indicated by the literature cited in our article, the rates of complete resolution of ONP associated with clipping of posterior communicating artery (PComA) aneurysm have typically ranged between 41 and 90% (2–4, 6, 7, 13, 14). A 100% success rate has not been reported. In our series, the rate of complete resolution of ONP after surgery was 85% compared with 33% after coiling. The remaining patients in both groups recovered to various degrees, but their ONP did not resolve completely. This finding suggests that surgical clipping is associated with a higher probability of complete recovery than endovascular treatment. We recognize that the study is limited by the rarity of PComA aneurysm-induced ONP. A multicenter prospective study would be needed to validate our results.

It is our practice and policy for all cerebrovascular patients to be evaluated and discussed daily in a team conference composed of cerebrovascular surgeons, neuroradiologists, and neurointerventionists. Patients are then presented with both endovascular and surgical options and the pros and cons of each. Although our findings suggest that surgical treatment may be associated with more favorable outcomes than the endovascular treatment of ONP, we continue to inform patients of both options to ensure that they have a full understanding of the risks and benefits of each.

We strongly disagree with the contention of Drs. Stiebel-Kalish and Rappaport that “cure of diplopia is not the main goal of treatment.” We think that simply saving patients’ lives without considering their neurological, ophthalmological, and psychological function recovery and the quality of their life is incompatible with neurosurgical practice in the 21st century, decades after microsurgical techniques were introduced to neurosurgery. Our goal is to provide patients the best possible outcome to allow them to resume their premorbid lifestyle as much as possible. Therefore, cure of diplopia is one of the primary goals for neurosurgeons or neuroradiologists and certainly for patients.

If a patient’s systemic condition can tolerate a surgical procedure, we recommend surgical clipping for the patient with ONP related to a PComA aneurysm. Again, however, patients are provided with a clear understanding of both treatment
options. It is important to recognize that microsurgical treatment for certain types of cerebrovascular diseases remains a better or equally viable choice as endovascular treatment. For instance, in the hands of a trained or experienced cerebrovascular surgeon, the morbidity and mortality rates associated with clipping an anterior circulation aneurysm are 0.8 and 1 to 4%, respectively, especially in patients younger than 70 years old (5, 8–10). In a meta-analysis, Raaymakers et al. (11) estimated that the risk of surgical mortality was 0.8% and that the risk of surgical morbidity was 1.9% in patients with a small anterior circulation aneurysm undergoing a clipping procedure. Solomon et al. (12) reported a 0% rate of mortality and permanent morbidity for patients with small anterior circulation aneurysms. PComA aneurysms that cause ONP are typically small (14). Suggesting to patients or physicians of other specialties that surgical treatment per se is associated with higher risks than endovascular treatment will create an unjustified bias and hamper the advance of medicine.

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**When the Bone Flap Hits the Floor**

To the Editor:

We read with interest Jankowitz and Kondziolka’s (7) article, “When the Bone Flap Hits the Floor,” and the accompanying comments in the September 2006 issue of *Neurosurgery*. As pointed out by the authors, dropping a bone flap is a rare and serious occurrence. We were somewhat surprised, however, by the authors’ conclusions and by the commentaries, which suggested that safe reuse of a dropped flap was a fait d’accompli.

Our hospital policy on this subject relies on the surgeon’s own risk-benefit assessment of reusing the dropped tissue. If replacement with an alternate piece of tissue or synthetic material is possible, we recommend that the tissue be discarded (3). Thus, a bone flap would be replaced by a mesh cranioplasty. If a tissue cannot be replaced, such as a donor organ, the implantation must proceed ahead after appropriate processing of the tissue.

What is the risk posed to the patient by reusing a dropped flap and what is appropriate processing of this tissue? Despite having read Jankowitz and Kondziolka’s article, we do not know the answer to either of these questions. None of the methods described in their review have been investigated or validated to an extent to which they can be recommended for clinical practice. Of the nine patients in their study who did not go on to cranioplasty or for whom follow-up information was not available, only one was followed for more than 1 year. Given that bone flaps are attached using wires, the Centers for Disease Control and Prevention require that these patients be followed for at least 1 year when tracking surgical site infections (10). Furthermore, passive retrospective determination of wound infections is notoriously inaccurate. An active prospective surveillance program whereby all patients are contacted postoperatively by someone other than their surgeon is recommended to determine whether or not infections may have developed postoperatively (8). Finally, given that the expected rate of postcraniotomy infection ranges from 1.72 to 2.40 infections per 100 procedures (10), any study that attempts to accurately measure the impact of dropped flaps on infection rates would require much larger numbers.

There is evidence that some of the recommended techniques may actually be harmful; both povidone-iodine (4, 5) and chlorhexidine (9, 11, 12) antiseptics have been linked to outbreaks and, paradoxically, can act as growth media for resistant organisms. Tissues may be damaged by autoclaving, which is one reason why ethylene oxide or gamma irradiation are recommended for tissue banking (1). Furthermore, bloody tissues may also continue to harbor viable organisms, despite exposure to sterilization temperatures in an autoclave (2).

If the tissue must be reused, we recommend washing it with sterile saline and antibiotics, as this is the safest choice and will theoretically decrease microbial burden without further contaminating the tissue or damaging it (6). Antibiotics may assist in decreasing the microbial burden even further. One may also