Treatement of Hypertensive Cerebellar Hemorrhage—Surgical or Conservative Management?

To the Editor: Kobayashi and colleagues recently reported their management criteria for spontaneous cerebellar hematomas. They proposed that patients with Glasgow Coma Scale (GCS) scores of 14 or 15 with a hematoma measuring less than 40 mm in maximum diameter should be treated conservatively, whereas for patients with GCS scores of 13 or less at the time of admission or with a hematoma measuring 40 mm or more, hematoma evacuation with decompressive suboccipital craniectomy should be the treatment of choice; for the patient whose brain stem reflexes are entirely lost with flaccid tetraplegia or whose general condition is poor, intensive therapy is not indicated. Unfortunately, their criteria are lacking in several respects: abnormalities in brain stem reflexes may not reflect an irreversible surgical problem; in addition, those authors did not factor in the presence of hydrocephalus (HY). Most importantly, their criteria did not have prognostic value in relation to surgical treatment: for example, 16 of their 20 patients meeting surgical criteria and actually receiving surgery indifferently recovered with moderate or worse disability or died.

We recently completed the analysis of 22 patients suffering from spontaneous cerebellar hematomas as the result of hypertension or allied conditions unrelated to a bleeding tumor or angioma and found better criteria having both surgical and prognostic value. There were 17 men and 5 women, with ages ranging between 14 and 72 years (mean, 56 yr). We evaluated these patients with the GCS at the time of admission and with the Glasgow Outcome Scale at the time of discharge. On the computed tomographic scan, we evaluated maximum diameter (and grouped patients above or below 3 cm), HY, location of the hematoma (vermian, paramedian, lateral, hemicerebellar), intraventricular hemorrhage (IVH), and degree of quadrigeminal cistern involvement (QCI; implying compression, obliteration, or the presence of blood). In order to achieve maximum prediction power for an eventual later classification, we decided to be aggressive even in clinically poor cases since the start of this study.

Our findings were as follows: 1) patients with a hematoma larger than 3 cm and a GCS score of worse than 9 had an unfavorable outcome, in spite of surgery (two deaths, one severely disabled); 2) patients with hematomas smaller than 3 cm and a GCS score of 9 or better all had a favorable result with conservative treatment; 3) no hematoma smaller than 3 cm occurred with a GCS score of less than 9; 4) for patients with hematomas larger than 3 cm and a GCS score of 9 or better, outcome depended on the location of the hematoma and the concurrent presence of HY, QCI, and IVH. The worst results were seen if HY, QCI, and IVH were all seen (two deaths and two severely disabled); the best results were seen in their absence (three good recoveries). One patient having all three had moderate disability, but in this patient, the hematoma was lateral (versus hemicerebellar and paramedian in the others). The patient with a paramedian lesion, HY, and QCI was severely disabled. The mere presence of IVH resulted in no unfavorable outcome in one paramedian hematoma.

In four patients with HY and QCI, the patient with the lateral lesion had a good recovery, the ones with the paramedian lesions were either moderately or severely disabled, and the patient with the hemicerebellar lesion was severely disabled. One patient with HY only and a vermian lesion was severely disabled. Thus, in this category, position, when other indicators are the same, has a prognostic value: lateral lesions have more favorable outcomes than do more medial lesions. HY was present, respectively, in 25, 66, 100, and 100% of Glasgow Outcome Scale classes 1, 2, 3, and 5; QCI was present in 25, 66, 80, and 100% of those classes, whereas IVH was seen in 0, 66, 40, and 100%. A descending order of prognostic potency is seen: HY, QCI and IVH. Position has value as an additional, independent indicator: more median or extensive hematomas, even with HY alone, have an unfavorable or less favorable outcome.

Our criteria can thus be described as follows: 1) Patients with a GCS score of 9 or better and a hematoma smaller than 3 cm have a favorable outcome with conservative treatment. 2) Patients with a GCS score of less than 9 and a hematoma larger than 3 cm should not be operated on because they have an unfavorable prognosis. 3) Patients with a GCS score of 9 or better and a hematoma larger than 3 cm should be managed according to the following indications. First, patients with HY, QCI, IVH, and a hematoma in a nonlateral or hemicerebellar position should not be operated on because they have an unfavorable outcome (with only one or two indicators in a nonlateral position, further experience is needed before assigning these cases to conservative management). Second, if the hematoma is lateral with HY, QCI, and IVH or combinations thereof, surgery is indicated, with a favorable outcome. Third, if HY, QCI, and IVH are not present (or IVH only is seen), conservative treatment is indicated, with favorable results. With these criteria, mortality should not exceed 20%.

It should be noted that we were not able to confirm the agreement permitted only in accordance with the publisher's copyright provisions. Redistribution of this article should be achieved through a follow-up study of patients with GCS scores of 14 to 15: in our series, patients scoring 15 always had a favorable outcome, which was not true for those scoring 14, who could end up severely disabled, in spite of aggressive treatment. We cannot agree with Neubauer and Schwenk, too, who suggested that all patients with a GCS score of lower than 9 and/or hematomas larger than 3 cm should be evacuated, although we agree that all patients with a lesion smaller than 3 cm and a GCS score of 9 or better have a favorable outcome without surgery.
There is no actual agreement with the data from Rosenthal and colleagues (3), who stated that even patients who are comatose with basal cisterns absent and a hematoma volume larger than 20 cm³ may recover completely after evacuation; however, a direct comparison between our and their series is not possible.

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REFERENCES: (1-3)


In reply: We thank Drs. Luparello and Canavero for their comments on our article. They have criticized our criteria for lacking prognostic value in surgical cases. They propose new criteria that are based on the combination of Glasgow Coma Scale (GCS) score, the size of the hematoma, the location of the hematoma, hydrocephalus, intraventricular hemorrhage, and the degree of quadrigeminal cistern involvement. We had investigated all of these factors before publishing our paper and obtained the following results. 1) The prognoses of the patients with laterally seated hematomas and the patients with medially seated ones are certainly different. The location of the hematoma, however, affects GCS sum score. That is, the GCS scores of lateral-type cases and medial-type cases are 12 ± 4.3 and 10 ± 4.7 (P < 0.005), respectively, in our series. 2) The extent of deformity of the quadrigeminal cistern correlates well with the size of the hematoma in most patients (this was shown in 88% of the patients with hematomas measuring 40 mm or more in diameter, whereas it was shown in only 20% of those with hematomas less than 40 mm). 3) Hydrocephalus causes deterioration of consciousness. To such patients, however, emergency ventricular drainage should be given with or without hematoma evacuation.

We had concluded that the simple combination of GCS score and the size of the hematoma could satisfy these multifactorial requirements. We believe that we should not predict bad outcomes for patients for whom conservative therapy is chosen according to the criteria nor abandon patients who could be salvaged by surgical intervention. If we had managed 101 patients of our series according to their criteria, 11 patients who had good recovery or moderate disability outcome in our series might have been lost without surgical intervention.

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Electrophrenic Respiration Following Intercostal to Phrenic Anastomosis in a Patient with Anterior Spinal Artery Syndrome: Case Report

To the Editor: I would like to submit an update on the subject of the case report that appeared previously (1). When Mr. P. left the United States, the intercostal to phrenic anastomosis was electrically functioning and, when stimulated, produced ample tidal volume to sustain respirations without respirator assistance. After returning to Greece, he stopped using the pacemaker for reasons that had nothing to do with the equipment or the procedure. When I was made aware of this, I contacted the Dobelle Institute who tracks all patients with phrenic pacemakers manufactured by Avery Laboratories, Inc. (Glen Cove, NY) and the Institute Dobelle AG (Zurich, Switzerland). They confirmed that Mr. P. was not using the pacemaker. On December 15, 1994, Mr. P.’s intercostal to phrenic anastomosis was tested again and found to be still conducting impulses across the anastomosis. There was also movement of both hemidiaphragms (grafted and ungrafted) during this test. These results were essentially identical to the postoperative stimulus trials in the United States. However, the patient, when questioned, indicated that he still had no desire to use the pacemaker.

Two other patients have subsequently had intercostal to phrenic anastomosis to enable a phrenic pacemaker to support respiration. One patient, Mr. B., grafted bilaterally, shows both good electrical activity and a tidal volume of 450 ml. The second patient shows poor electrical activity on his unilateral graft but has been improving. This information is being provided to show that this procedure, like other peripheral nerve surgery, may not always be successful technically or sociologically and should be done only as a last resort when it is clear that the phrenic nerve has no possibility of being successfully used for more conventional stimulation.

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REFERENCES: (1)


To the Editor: We were taught and we continue to
teach that in cases of raised intracranial pressure, at least in adults, a plain cranial x-ray will show an erosion of the sellar turcica, starting most of the time from the posterior clinoid. The reason that the posterior clinoid is affected first has not been, to our knowledge, fully explained. We hereby suggest an explanation that we call "the shoe theory."

If we consider the anterior fossa and the sellar turcica to be the base of a shoe that is upside down (Fig. 1) (the ethmoidosphenoidal bone being "the sole," the sellar turcica being "the instep," and the posterior clinoid being "the heel"), we can easily understand, by analogy, that the heel on the shoe is the part that is usually eroded first. By explanation, the pressure, transmitted via the basal cisterns in the case of raised intracranial pressure, over the ethmoidosphenoidal bone is applied on a wider surface, and therefore, the total pressure on each square millimeter is less than the pressure over the posterior clinoid, which exposes less surface. We hope that this explanation will shed some light on this issue.

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Figure 1. 1, Ethmoidosphenoidal bone (sole); 2, sellar turcica (instep); 3, posterior clinoid (heel).
Drawings by Bouchard (1822) of miliary aneurysms, which he and Charcot considered to be the source of bleeding in intracranial hemorrhage.