

## COMMENTARY - NEUROSURGERY

In this issue, we have selected four papers for discussion. The first is a very interesting multicentre pilot study published in Journal of Neurosurgery. The authors have conducted a prospective open label trial of bilateral subcallosal cingulate gyrus deep brain stimulation on patients with treatment resistant depression evaluated their outcomes by the Hamilton Rating Scale for Depression at 1, 6 and 12 months. They have validated the results of a previously conducted single centre study and even though the numbers are still small, the results are encouraging. It would be interesting to follow this trial to its completion and read the whole report. The second paper refers to neuro-oncology and like several other papers on this topic, this too attempts to question the rationale for gross total resection for glioblastoma multiformes showing that patients who had neurological deficits or peri-operative complications following surgery tend to do worse than patients who despite a residual tumor, have no such complications. The numbers are impressive even though the notion remains debatable in the light of other publications on the same topic. The third paper is a prospective, randomized trial comparing expansile cervical laminoplasty and cervical laminectomy and fusion for multilevel cervical myelopathy, which despite very small numbers, managed its way into neurosurgery. The paper at best provides food for thought and the topic requires more comprehensive data before any meaningful recommendations can be derived. The fourth paper is the BRAT or Barrow Ruptured Aneurysm Trial, which comes from what is today, probably the world's most prominent neurovascular surgery centre. The authors conclude by suggesting that for acutely ruptured aneurysms, coil embolization lead to fewer poor outcomes at one year follow ups, compared to surgical clipping.

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Lozano AM, Giacobbe P, Hamani C, Rizvi SJ, Kennedy SH, Kolivakis TT, Debonnel G, Sadikot AF, Lam RW, Howard AK, Ilcewicz-Klimek M, Honey CR, Mayberg HS.

### A MULTICENTER PILOT STUDY OF SUBCALLOSAL CINGULATE AREA DEEP BRAIN STIMULATION FOR TREATMENT-RESISTANT DEPRESSION

**Objective:** Deep brain stimulation (DBS) has been recently investigated as a treatment for major depression. One of the proposed targets for this application is the subcallosal cingulate gyrus (SCG). To date, promising results after SCG DBS have been reported by a single center. In the present study the authors investigated whether these findings may be replicated at different institutions. They conducted a 3-center prospective open-label trial of SCG DBS for 12 months in patients with treatment-resistant depression. **Methods:** Twenty-one patients underwent implantation of bilateral SCG electrodes. The authors examined the reduction in

Hamilton Rating Scale for Depression (HRSD-17) score from baseline (RESP50). **Results:** Patients treated with SCG DBS had an RESP50 of 57% at 1 month, 48% at 6 months, and 29% at 12 months. The response rate after 12 months of DBS, however, increased to 62% when defined as a reduction in the baseline HRSD-17 of 40% or more. Reductions in depressive symptomatology were associated with amelioration in disease severity in patients who responded to surgery. **Conclusions:** Overall, findings from this study corroborate the results of previous reports showing that outcome of SCG DBS may be replicated across centers.

## World Neurosurg. 2011 Dec;76(6):572-9.

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### THE RISK OF GETTING WORSE: SURGICALLY ACQUIRED DEFICITS, PERIOPERATIVE COMPLICATIONS, AND FUNCTIONAL OUTCOMES AFTER PRIMARY RESECTION OF GLIOBLASTOMA.

**BACKGROUND:** Gross total resection (GTR) prolongs survival but is unfortunately not achievable in the majority of patients with glioblastoma multiforme (GBM). Cytoreductive debulkings may relieve symptoms of mass effect, but it is unknown how long such effects sustain and to what degree the potential benefits exceed risks. We explore the impact of surgical morbidity on functional outcome and survival in unselected GBM patients. **Methods:** We retrospectively included 144 consecutive adult patients operated on for primary GBM at a single institution between 2004 and 2009. Reporting of adverse events was done in compliance with Good

Clinical Practice Guidelines. **Results:** A total of 141 (98%) operations were resections and 3 (2%) were biopsies. A decrease in Karnofsky performance status (KPS) scores was observed in 39% of patients after 6 weeks. There was a significant decrease between pre- and postoperative KPS scores ( $P < 0.001$ ). Twenty-two (15.3%) patients had surgically acquired neurological deficits. Among patients who underwent surgical resection, those with surgically acquired neurological deficits were less likely to receive radiotherapy ( $P < 0.001$ ), normofractionated radiotherapy ( $P = 0.010$ ), and chemotherapy ( $P = 0.003$ ). Twenty-eight (19.4%)

patients had perioperative complications. Among patients who underwent surgical resection, those with perioperative complications were less likely to receive normofractionated radiotherapy ( $P = 0.010$ ) and chemotherapy ( $P = 0.009$ ). Age ( $P = 0.019$ ), Surgically acquired neurological deficits ( $P < 0.001$ ), and surgical complications ( $P = 0.006$ ) were significant predictors for worsened functional outcome after 6 weeks. GTR ( $P = 0.035$ ), perioperative complications

( $P = 0.008$ ), radiotherapy ( $P < 0.001$ ), and chemotherapy ( $P = 0.045$ ) were independent factors associated with 12-month postoperative survival. Conclusion: Patients with perioperative complications and surgically acquired deficits were less likely to receive adjuvant therapy. While cytoreductive debulking may not improve survival in GBM, it may decrease the likelihood of patients receiving adjuvant therapy that does.

## **Neurosurgery. 2012 Feb;70(2):264-77.**

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## **A PROSPECTIVE, RANDOMIZED TRIAL COMPARING EXPANSILE CERVICAL LAMINOPLASTY AND CERVICAL LAMINECTOMY AND FUSION FOR MULTILEVEL CERVICAL MYELOPATHY**

**BACKGROUND:** Controversy exists as to the best posterior operative procedure to treat multilevel compressive cervical spondylotic myelopathy. **Objective:** To determine clinical, radiological, and patient satisfaction outcomes between expansile cervical laminoplasty (ECL) and cervical laminectomy and fusion (CLF). **Methods:** We performed a prospective, randomized study of ECL vs CLF in patients suffering from cervical spondylotic myelopathy. End points included the Short Form-36, Neck Disability Index, Visual Analog Scale, modified Japanese Orthopedic Association score, Nurick score, and radiographic measures. **Results:** A survey of academic North American spine surgeons ( $n = 30$ ) demonstrated that CLF is the most commonly used (70%) posterior procedure to treat multilevel spondylotic cervical myelopathy. A total of 16 patients were randomized: 7 to CLF and 9 to ECL. Both groups

showed improvements in their Nurick grade and Japanese Orthopedic Association score postoperatively, but only the improvement in the Nurick grade for the ECL group was statistically significant ( $P < .05$ ). The cervical range of motion between C2 and C7 was reduced by 75% in the CLF group and by only 20% in the ECL group in a comparison of preoperative and postoperative range of motion. The overall increase in canal area was significantly ( $P < .001$ ) greater in the CLF group, but there was a suggestion that the adjacent level was more narrowed in the CLF group in as little as 1 year postoperatively. **Conclusion:** In many respects, ECL compares favorably to CLF. Although the patient numbers were small, there were significant improvements in pain measures in the ECL group while still maintaining range of motion. Restoration of spinal canal area was superior in the CLF group.

## **J Neurosurg. 2012 Jan;116(1):135-44. Epub 2011 Nov 4.**

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## **THE BARROW RUPTURED ANEURYSM TRIAL**

**OBJECTIVE:** The purpose of this ongoing study is to compare the safety and efficacy of microsurgical

clipping and endovascular coil embolization for the treatment of acutely ruptured cerebral aneurysms and to determine if one treatment is superior to the other by examining clinical and angiographic outcomes. The authors examined the null hypothesis that no difference exists between the 2 treatment modalities in the setting of subarachnoid hemorrhage (SAH). The current report is limited to the clinical results at 1 year after treatment. **Methods:** The authors screened 725 patients with SAH, resulting in 500 eligible patients who were enrolled prospectively in the study after giving their informed consent. Patients were assigned in an alternating fashion to surgical aneurysm clipping or endovascular coil therapy. Intake evaluations and outcome measurements were collected by nurse practitioners independent of the treating surgeons. Ultimately, 238 patients were assigned to aneurysm clipping and 233 to coil embolization. The 2 treatment groups were well matched. There were no anatomical exclusions. Crossing over was allowed, but primary outcome analysis was based on the initial treatment modality assignment. Post-treatment care was standardized for both groups. Patient outcomes at 1 year were independently assessed using the modified Rankin Scale (mRS). A poor outcome was defined as mRS score > 2 at 1 year. The primary outcome was based on the assigned group; that is, by intent to treat. **Results:** One year after treatment, 403 patients were available for evaluation. Of these, 358 patients had actually undergone treatment. The remainder either died before treatment or had no identifiable source of SAH. A poor outcome (mRS score > 2) was observed in 33.7% of the patients assigned to aneurysm clipping and in 23.2% of the patients assigned to coil embolization (OR 1.68, 95% CI 1.08-2.61; p = 0.02). Of treated patients assigned to the coil group, 124 (62.3%) of the 199 who were eligible for any treatment actually received endovascular coil embolization. Patients who crossed over from coil to clip treatment fared worse than patients assigned to coil embolization, but no worse than patients assigned to clip occlusion. No patient treated by coil embolization suffered a recurrent hemorrhage. **Conclusions:** One year after treatment, a policy of intent to treat favoring coil embolization resulted in fewer poor outcomes than clip occlusion. Although most aneurysms assigned to the coil treatment group were treated by coil embolization, a substantial number crossed over to surgical clipping. Although a

policy of intent to treat favoring coil embolization resulted in fewer poor outcomes at 1 year, it remains important that high-quality surgical clipping be available as an alternative treatment modality.