Intracranial-intracranial bypass showed a trend toward better outcome than extracranial-intracranial bypass in the treatment of select complex intracranial aneurysms.

**Background:** Extracranial-intracranial (EC-IC) bypass is an important technique in the management of select complex aneurysms. Intracranial to intracranial (IC-IC) bypass has been reported as an alternative to EC-IC bypass, but large studies on this approach are lacking in the literature.

**Objective:** To evaluate the hypothesis that IC-IC bypass compares favorably to EC-IC and may have advantages in select circumstances.

**Methods:** Between November 1997 and November 2007, 82 aneurysm patients were treated with cerebral revascularization. Data were reviewed retrospectively. Patients had preoperative, early postoperative, and long-term follow-up assessment of their neurological outcome using the Glasgow Outcome Scale (GOS). Aneurysm occlusion and bypass patency were determined with angiography.

**Results:** 57% of patients were treated with EC-IC bypass, and 43% with IC-IC bypass. Choice of procedure depended primarily on aneurysm location and characteristics; 34% of patients underwent staged endovascular aneurysm occlusion on a separate day, whereas in 66% of patients, the aneurysm was occluded at the same time as the bypass. Overall, 97.6% of aneurysms were obliterated, and 91% of bypasses were patent at follow up. Both IC-IC and EC-IC groups had similar aneurysm obliteration and bypass patency rates. Concerning patient outcomes, 3 patients died in the perioperative period, all from the EC-IC bypass group. It should be noted, however, that all 3 patients had undergone an uncomplicated bypass but later succumbed to complications during endovascular treatment. The overall mean follow-up was 41 months. It did not differ significantly between both groups. Four late deaths were noted, 3 in the EC-IC bypass group. Good outcome rates were similar in both groups. Late follow-up GOS scores and postoperative versus preoperative GOS scores showed a trend toward better outcomes in the IC-IC bypass group.

**Conclusions:** Although IC-IC bypass is technically challenging, certain advantages over EC-IC bypass make it a very appealing alternative. IC-IC bypass can replace the conventional EC-IC bypass in the treatment of select aneurysms.

**Reviewer's Comments:** The authors have made an excellent contribution to the literature. They report a number of creative microsurgical solutions to difficult neurovascular pathologies. Clearly, many of the aneurysmal lesions illustrated do not have good endovascular options with existing technology. This type of creative approach represents a transition in the way microvascular surgeons conceptualize neurovascular anatomy. This approach may eliminate the need for cervical dissections for proximal anastomoses in some cases and, in many circumstances, may obviate the need for graft harvest. This article will be a valuable reference to cerebrovascular and cranial base surgeons as they search for creative solutions for complex anatomic problems. (Reviewer-Bernard R. Bendok, MD).
Can ICP Monitors Be Placed in Patients With Hepatic Failure?

Insertion of Intracranial Pressure Monitors in Fulminant Hepatic Failure Patients: Early Experience Using Recombinant Factor VII.

Le TV, Rumbak MJ, et al:
Neurosurgery 2010; 66 (March): 455-458

Background: Patients with fulminant-hepatic-failure (FHF) suffer from coagulopathy, brain edema, and increased intracranial pressure. Hepatic encephalopathy (HE) is thought to be a combination of cerebral cytotoxic edema, hypervolemia, and increased blood flow. Intracranial pressure (ICP) monitors are commonly used in FHF patients; however, timing and location of placement remain contentious due to procedural risks and unproved positive impact on outcomes. Nonetheless, the Acute Liver Failure Study Group recommends ICP monitoring placement in all grade 3 to 4 HE patients pending transplantation, as occurrence of high ICP is reported to be 25% to 35% and 65% to 75% in grades 3 and 4, respectively. Evidently, the coagulopathy associated with FHF renders ICP monitor placement risky, and most neurosurgeons recommend correcting the INR to <1.6 for a safer procedure. Recombinant factor VII (rFVIIa) has been used to control bleeding in patients with hemophilia A and B as well as with factor 8 or 9 inhibitors. It has also been used for emergency reversal of coagulopathy in the setting of traumatic brain injury, FHF, and others.

Objective: The authors reported their experience with rFVIIa use in FHF patients undergoing ICP monitor placement.

Methods: The records of 11 consecutive patients with FHF treated over a 1-year period were analyzed. Data collected included age, sex, FHF cause, Glasgow Coma Scale (GCS) at insertion, duration of ICP monitoring, prothrombin time (PT)/partial thromboplastin time (PTT)/ international normalized ratio (INR) pre-rFVIIa administration, presence of intracranial hypertension, and presence of intraparenchymal hemorrhage pre-/post-ICP monitor placement. All patients underwent ICP monitor placement when they progressed to grade 3 or 4 encephalopathy. Prior to ICP monitor insertion, rFVIIa was given at an average 3-mg IV bolus. The ICP monitor was placed 15 to 120 minutes after rFVIIa-administration. A CT head scan was obtained pre- and post-procedure.

Results: The average GCS at insertion was 4.2. The average INR, PT, and PTT was 3, 31, and 44, respectively, and the average duration of monitoring was 4.2 days. No post-procedure complications, especially hemorrhages, were noted. In 1 patient, a previously identified small intracranial hemorrhage unrelated to ICP monitor location remained stable. No deep venous thrombosis or pulmonary embolism occurred.

Conclusions: ICP monitoring placement is feasible without hemorrhagic or thrombotic complications in FHF patients after administration of rFVIIa.

Reviewer's Comments: rFVIIa has been used in several applications, one being prior to emergent procedure or surgery in a coagulopathy patient due to liver failure. At our center, we routinely use rFVIIa prior to emergent external ventricular drain placement in this patient population, and it seems to allow for prompt intervention without hemorrhagic and thrombotic complications. In this article, the authors report their experience with rFVIIa specifically for ICP monitor placement in FHF patients. The study is retrospective and the patient population is small, but the results are promising. A larger prospective, randomized trial is warranted to further assess the safety, efficacy, and complications of rFVIIa in this patient population. (Reviewer-Ziad A. Hage, MD).

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Keywords: Fulminant Hepatic Failure, Intracranial Pressure Monitoring, Intraparenchymal Hemorrhage, Recombinant Factor VII

Print Tag: Refer to original journal article
Traumatic brain injury increases the risk of death within 1 year after hospitalization, particularly within the first month.

**Background:** Patients with traumatic brain injury (TBI) have been shown to have increased mortality in the post-acute injury period. Study limitations include short follow-up of socio-economically bland, rehabilitation-based populations.

**Objective:** To characterize long-term mortality and life expectancy after TBI in a socioeconomically diverse population, comparing causes and risk factors to those of the general population.

**Design:** Population-based retrospective cohort study.

**Methods:** Patients were identified from the Colorado Traumatic Brain Injury Surveillance System (CTBISS), enrolled on the basis of ICD-9 head injury codes, excluding “head injury, unspecified,” from 1998 to 2003. Death (date and cause) was determined from the Colorado Death Master File. Race and ethnicity was supplemented from the Colorado Trauma Registry. Primary hospitalization payor was grouped into private insurance, liability insurance, government, or self-pay. Injury severity was determined from CTBISS as ICD-9 codes and Abbreviated Injury Severity scores. Relative mortality to the general population was estimated as the ratio of observed to expected deaths. Cox proportional hazard models identified risk factors for death.

**Results:** 18,998 patients had a median follow-up of 4.4 years (range, <1 to 8 years). Observed mortality rate of the TBI cohort was 3.0 deaths per 100 person-years of follow-up, 2.47 times the risk of death in the general population after controlling for age, sex, and race/ethnicity. The risk of mortality was 25.20 times greater during the first month after discharge, diminishing to 1.71x risk for TBI patients surviving >1 year. Age-stratified risk of death was highest in TBI patients aged 40 to 59 years (4.72x). The causes of death risks were >2.5x for mental/behavioral disorders (4.7x), nervous system diseases (3.33x), sepsis (3.0x), digestive system diseases (2.83x), and pneumonia (3.25x). Suicide was associated with a 2.83x increased risk; 36% of 504 deaths <1 month after discharge were from circulatory disorders, and 21% were from unknown causes. Risk factors for death included older age, injury severity, and >3 comorbid health conditions. Hospital payor had no impact on mortality.

**Conclusions:** TBI reduces life expectancy and increases risk of death in months and years after discharge from acute hospital care. The risk of death decreases as survival time increases.

**Reviewer's Comments:** This study illustrates that the effects of TBI on patient mortality are most significant relatively soon after discharge from acute care hospitalization. The role of the neurosurgeon is not addressed by the study, but several responses are appropriate to consider. First, increased neurosurgical scrutiny of patients with TBI may be warranted; since operative issues are usually not present, neurosurgeons frequently "sign off" during later stages of hospitalization. Another examining physician may recognize and prevent potential negative impacting conditions. Second, post-discharge follow-up of TBI patients by neurosurgeons may also be warranted, again to recognize and intervene for confounding conditions. Further study is necessary to see if these interventions can reduce TBI patient mortality. (Reviewer-N. Scott Litofsky, MD).

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Keywords: Brain Injury, Comorbidity, Mortality, Population Surveillance, Rehabilitation

Print Tag: Refer to original journal article
WBRT Improves Outcome After Surgery for SBM

Adjuvant Whole-Brain Radiation Therapy After Surgical Resection of Single Brain Metastases.

McPherson CM, Suki D, et al:

Neuro Oncol 2010; February 14 (): epub ahead of print

WBRT after surgery for single brain metastasis reduces local recurrence of large tumors and distant recurrence if there is active systemic disease, regardless of presumed tumor radiosensitivity.

**Background:** Despite Class I evidence that whole-brain radiation therapy (WBRT) after surgical resection of single brain metastasis (SBM) improves outcome, WBRT may be withheld selectively to minimize radiation-induced dementia.

**Objective:** To evaluate factors on the effectiveness of adjuvant WBRT in delaying tumor progression and prolonging survival after surgical resection of SBM.

**Design:** Single-institution retrospective study.

**Methods:** Patients >16 years old with SBM and Karnofsky Performance Scale >70 treated with surgical resection between 1993 and 2003 were divided into adjuvant WBRT and observation (non-WBRT) groups for comparison of tumor recurrence, either local (same site) or distant (new brain site), and survival. Patients were further subdivided into radiosensitive (lung, breast, testicular, gastrointestinal, gynecologic, head and neck, lymphoma, and prostate cancers) and radioresistant (melanomas, sarcomas, kidney, thyroid, and genitourinary) cancers, with some exceptions. WBRT, dosed at 30 Gy in 10 to 15 fractions, was defined as adjuvant when administered postoperatively before local or distant brain progression or recurrence.

**Results:** 142 of 358 patients (40%) had WBRT, and 216 (60%) were observed after surgical resection. Twenty-five of 161 (16%) radioresistant tumors and 117 of 197 (59%) radiosensitive tumors received WBRT. Median survival was 12.5 months and was significantly greater for WBRT (14.7 months) than for observation (11.7 months). Predictors of shorter survival included age >55 years, active systemic cancer, radioresistant histology, infratentorial location, brain tumor presentation within 6 months of initial cancer diagnosis, and preoperative tumor size >3 cm. Local recurrence occurred in 15% of WBRT (median, 14.8 months) and 21% of observation patients (median, 9.2 months). Withholding WBRT was a significant predictor of local recurrence for tumors >3 cm. Distant brain recurrence occurred in 30% of WBRT (median, 10.1 months) and 53% of observation (median, 7.0 months) patients. Withholding WBRT also had an increased risk of distant recurrence in patients with active systemic disease. Distant and local recurrence in WBRT was similar for radiosensitive and radioresistant tumors.

**Conclusions:** Withholding WBRT after resection of SBM increased local recurrence in tumors >3 cm and increased distant recurrence in patients with active systemic disease. Presumed radiosensitivity was not a factor in WBRT effects.

**Reviewer’s Comments:** This study further supports the use of WBRT to optimize patient outcome after resection of SBM. Tumor radiosensitivity should not be considered in the WBRT decision, but bias in patient selection for WBRT among radioresistant tumors may have some impact on reported results. The data do not include neurocognitive status after WBRT or the role of stereotactic radiosurgery to the tumor bed after surgery, 2 important issues presently factored into decision making. Additional study is needed to define when to use WBRT and/or radiosurgery as adjuvants to surgery; some form of radiotherapy should be considered, particularly in patients with large tumors or in those with active systemic disease. (Reviewer-N. Scott Litofsky, MD).

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**Keywords:** Brain Metastases, Surgical Resection, Whole-Brain Radiation Therapy

**Print Tag:** Refer to original journal article
Lumbar microdiscectomy in children is effective and carries a low complication rate.

**Background:** About 5.5 in 100,000 people aged <25 years will require surgery for a herniated lumbar disc, compared to 45 per 100,000 in those aged >25 years. Presentation with lower back pain (LBP), radiculopathy, and neurological deficits is similar. Few case series of open discectomies in children were reported during the 1970s to 1990s. The techniques described were substantially different than those used today, and the microdiscectomy technique used in adults hasn’t been described in children.

**Methods/Objective:** The authors retrospectively reviewed the records of 87 eligible patients <18 years of age who underwent lumbar microdiscectomy during a 10-year period to determine the immediate and long-term outcomes. All patients had preoperative lumbar spine MRI and intraoperative fluoroscopic guidance, and the microscope was used for all patients.

**Results:** The age range was 12 to 18 years. Sixty percent of patients were female, of whom 64% were competitive athletes; 85% had LBP, 95% had radiculopathy, 26% had lower extremity weakness, 41% had hypoesthesia, 22% had loss of deep tendon reflexes, and 95% had a positive straight leg-raising test. Mean time from development of pain to surgical intervention was 12.2 months. Almost all patients had physical therapy. The main surgical indication was persistent pain and inability to return to usual daily activities and sports, as the majority of neurological deficits were subtle. The most common levels of surgery were L4-5 in 45% and L5-S1 in 36%. Two-level discectomies were performed in 10%. Average postoperative length of stay was 24 hours. Five patients required a surgical exploration, 2 for CSF leakages, 1 for a wound infection, 1 for residual disc with persistent radiculopathy, and 1 for an unexplained temporary leg monoparesis. Four patients required repeat lumbar surgery at the same level and 1 at an adjacent level. The authors believe that even though children respond less to conservative management than adults, most children will improve without surgery. Based on 1-year clinical consultations in their referral institution, the senior author saw 44 new patients with lumbar disc herniations, of which only 13 ended up needing surgery, indicating that >70% were able to be managed conservatively.

**Conclusions:** Lumbar microdiscectomy in the pediatric population is an effective procedure with a low complication rate.

**Reviewer’s Comments:** This is a valuable paper that allows the pediatric neurosurgeon to counsel the adolescent and the family with more tangible data than simply using the adult literature. As opposed to the common empirical knowledge of herniated discs in children and adolescents being poorly treated conservatively, this article emphasizes the large amount of patients in this age benefitting from conservative management. (Reviewer-Amir Kershenovich, MD).

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Keywords: Lumbar Microdiscectomy, Children

Print Tag: Refer to original journal article
Treatment of Trigeminal Neuralgia -- GR or BC?

Comparison of Percutaneous Balloon Compression and Glycerol Rhizotomy for the Treatment of Trigeminal Neuralgia.


J Neurosurg 2010; February 26 (): epub ahead of print

At the Karolinska University Hospital, patients who are not candidates for microvascular decompression are offered GR as a first choice, followed by BC. Radiofrequency rhizotomy is a third choice, and gamma knife is reserved for patients with altered coagulation, those with a poor medical condition, or those who specifically request it.

Background: Glycerol rhizotomy (GR) and balloon compression (BC) have never been compared in the same study. GR has lost its popularity mainly because it is more complicated for the patient (he/she has to sit up in bed for about 1 hour during the procedure), and the published results are more variable than those for BC.

Objective: To compare the results of GR versus BC in patients with trigeminal neuralgia.

Design: Retrospective study with no placebo group.

Participants/Methods: 92 GR and 61 BC patients. Mean age was 70 years. Males represented 40% of each group. The duration of trigeminal neuralgia was 11 years. The first division was involved in about 30% of cases. Previous surgeries were performed in 55% of the GR group and in 92% of the BC group. These previous surgeries included GR, BC, microvascular decompression, and gamma knife. GR was done under light sedation, in the sitting position. BC was done under general anesthesia with intubation, in the supine position. Intraoperative imaging with a contrast agent was used for both procedures. Follow-up was 36 months in the GR group and 48 months in BC group.

Results: Immediate pain relief was obtained in 87% and 85% of GR and BC cases, respectively. In the GR group, immediate complete analgesia occurred in 50% of subjects and occurred within 2 weeks for the other 50%. In the BC group, the response was either immediate or none. The long-term outcome was very similar in both groups. The 50% delay for recurrences when this was a first procedure was 24 months for the GR group and 6 months for the BC group, versus 8 and 21 months in the GR and BC groups, respectively, when patients had a previous procedure. With the exclusion of numbness, complication rates were 11% (mostly dysesthesia) in the GR group and 23% (dysesthesia, cranial nerve deficit, and AV fistulae) in the BC group.

Conclusions: While a randomized, controlled study is needed, the value of both techniques is confirmed, and it is reasonable to propose GR as a first option.

Reviewer's Comments: While I agree with the authors that GR is the best first option in patients who are not candidates for microvascular decompression, one should be aware that, in the United States, sterile glycerol is not available in all medical centers. This is regrettable given that the complication rates are low and benign for GR. Finally, one should keep in mind that the most common cause of treatment failure in trigeminal neuralgia is the wrong diagnosis. When patients have facial pain other than trigeminal neuralgia, stimulation therapy should be tried first because it provides good results, is reversible, and has few complications. (Reviewer-Luc Jasmin, MD).

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Keywords: Facial Pain, Microvascular Decompression, Gamma Knife, MS

Print Tag: Refer to original journal article
A high fraction of survivors among preoperative comatose aneurysmal subarachnoid hemorrhage patients recover to good physical and cognitive function.

**Objective:** To determine the 1-year cognitive function and health-related quality of life (HR-QOL) in patients who present comatose to the hospital after aneurysmal subarachnoid hemorrhage.

**Design/Methods:** A retrospective review of consecutively treated Hunt and Hess Grade V (comatose) patients was performed. All surviving patients underwent a series of different neuropsychological tests and 2 HR-QOL tests 1 year after aneurysmal subarachnoid hemorrhage.

**Results:** 70 consecutively treated Grade V patients were identified; 35 survived the aneurysmal subarachnoid hemorrhage, and 26 underwent testing to determine the status of their cognitive function. Of the 26 patients tested, 20 were females and 6 were males. Median age was 49 years. The testing identified 2 separate groups of patients: (1) 14 patients with good cognitive function who were able to maintain an active lifestyle and experienced only mild deficits in cognitive functioning; and (2) 12 patients with poor cognitive and motor function. Those with good cognitive functioning were typically younger and had more years of education. Patients with good cognitive function had better HR-QOL scores than those with poor cognitive function.

**Conclusions:** A significant number of aneurysmal subarachnoid hemorrhage patients who present with Hunt and Hess Grade V (comatose) clinical status can recover to good physical and cognitive function, allowing them to enjoy a relatively healthy quality of life.

**Reviewer's Comments:** The authors should be congratulated for reporting their excellent clinical results. They present a thorough and comprehensive study of cognitive function and HR-QOL in patients who present comatose to the hospital after subarachnoid hemorrhage. While these results are outstanding and highlight the technical skills of the authors who successfully have managed a very ill group of patients, we wonder whether the cohort of patients studied was truly Grade V. That is, the manuscript does not clearly indicate how the Grade V status was determined. This was a retrospective analysis. Often some patients present in a comatose state but begin to regain consciousness within a few hours of arrival, often after placement of an external ventricular drain. The cognitive assessments contained multiple tests of different domains (executive functioning, language, attention, and memory) and clearly separated the population into 2 groups. The 14 patients (of 26) with good cognitive performance scores had significantly higher SF-36 physical functioning and role emotional scores than those with poor cognitive performance. Although these 14 patients had good HR-QOL scores, only 7 of 14 (50%) returned to work. Further neuropsychological studies are needed to determine which patients might be most likely to return to meaningful employment after subarachnoid hemorrhage.

(Reviewer-Zoher Ghogawala, MD)

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Keywords: Aneurysmal Subarachnoid Hemorrhage, Quality of Life

Print Tag: Refer to original journal article
Can CT Alone Clear C-Spine in Obtunded Trauma?

Cervical Spine Clearance in Obtunded Blunt Trauma Patients: A Prospective Study.


Well-interpreted CT scan of the cervical spine from skull base to T4 rarely misses cervical spine injury in obtunded patients, making dynamic plain x-rays unnecessary.

**Background:** The best method for cervical spine clearance in obtunded blunt trauma patients remains without consensus. Missing injuries causing an unstable cervical spine can have devastating clinical and medical-legal consequences to both patient and physician, and clearance delays can be associated with complications.

**Objective:** To describe the accuracy of assessment of cervical spine by CT scanning compared to flexion-extension radiographs in obtunded blunt trauma patients.

**Design:** Single-institution prospective case series.

**Methods:** All blunt trauma patients aged >18 years admitted to an intensive care unit were evaluated with CT scan of the cervical spine from skull base to T4. Patients with normal CT scans, defined by absence of fracture, subluxation, or disc prolapse, were evaluated by dynamic flexion and extension x-rays. These x-rays were performed with a physician gently flexing and extending the patient's neck until significant resistance was encountered. Translation ≥3.5 mm or angulation >20° at each excursion end point on dynamic x-rays represented abnormality. The authors defined a clinically significant level of occult injuries missed by CT scan as ≥3 per 1000 (0.3%).

**Results:** 402 of 948 blunt trauma patients (42%) met study inclusion criteria. Study patients had longer stays in the intensive care unit (7 days) and hospital (23 days) than other trauma patients. One of 402 patients (0.25%) had abnormal flexion extension x-rays after an initially reported normal CT scan; one-sided confidence interval was 1.12%, exceeding a priori level of significance. Independent retrospective review of the "normal" CT scan by study authors from trauma surgery, neurosurgery, and radiology, as well as a blinded radiologist, concluded that the CT was abnormal and was interpreted incorrectly by the reporting neuroradiologist.

**Conclusions:** CT imaging of the cervical spine in obtunded blunt trauma patients is highly accurate. Flexion-extension x-rays do not contribute to identifying injuries and do not need to be routinely performed.

**Reviewer's Comments:** From a statistical perspective, this study's results suggest that CT alone is sufficient for evaluating cervical spine injuries in obtunded blunt trauma patients. The study did not include data about patients’ symptoms or neurological deficits. Criteria for abnormal flexion-extension views are generous. My major concern, however, about generalizing these results to practice relates to the fact that the one instance of CT failure to diagnose injury occurred because the radiologist misinterpreted the CT findings. This error occurred in the context of participation in a prospective study, where scrutiny of images is likely to be keener than in usual practice. Using CT alone requires consistent, rigorous, high-quality interpretation of CT scans at all times. Dynamic flexion and extension cervical spine x-rays can serve as a check in the event of CT scan misinterpretation. I prefer MRI to assess for ligamentous injury if CT is normal to safeguard obtunded patients from potential injury with flexion and extension. (Reviewer-N. Scott Litofsky, MD).

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**Keywords:** Cervical Spine Injury, Cervical Spine Clearance, CT, Dynamic Radiographs, Obtunded Patients

**Print Tag:** Refer to original journal article
Intrathecal Baclofen Can Accelerate Scoliosis in Children

Do Baclofen Pumps Influence the Development of Scoliosis in Children?

Burn SC, Zeller R, Drake JM:
J Neurosurg Pediatr 2010; 5 (February): 195-199

Thirty-two children implanted with a baclofen pump showed a greater than predicted worsening of their scoliosis based on serial measures of the Cobb angles over 31 months.

Background: Intrathecal delivery allows a much higher concentration of baclofen to the spinal cord and fewer side effects. Whether the resulting decrease in muscle tone has a negative impact is still unknown.

Objective: To determine if continued intrathecal baclofen therapy speeds up or predisposes to the development of scoliosis in children afflicted with cerebral palsy, dystonia, or spasticity.

Design: Retrospective study.

Participants/Methods: The charts of 32 children with adequate preoperative and postoperative imaging were reviewed, and the Cobb angles were compared over time. Fifteen of these children had a pre-existing scoliosis. The average follow-up was 31 months (range, 1 to 118 months).

Results: Scoliosis developed or worsened in 25 of 32 patients. The tendency to develop scoliosis was greater in children aged <15 years. All patients with a pre-existing scoliosis progressed regardless of the underlying conditions for which the baclofen pump was placed. Four patients had to have their pump removed, 2 because of scoliosis progression and 2 others because of infection. In 1 patient, the rate of the scoliosis progression went from 1.66° a month before pump removal to 0.75° a month after pump removal.

Conclusions: Intrathecal baclofen in children might accelerate the progression of scoliosis. A prospective study is needed.

Reviewer’s Comments: The consequences of worsening of scoliosis in growing children are so serious that one has to weigh the pros and cons of placing an intrathecal baclofen pump. This study, however, is incomplete. In particular, the absence of control group (ie, patients without a pump) is problematic. Also missing are details about the neurological exams of all patients, including their response to intrathecal baclofen. Since pumps can be adjusted on variable rates, were some patients receiving more at night? The authors state a need for a prospective study. I suggest that they design a double-blind, crossover strategy whereby half the patients are put on saline and the other half on baclofen, with a rotation in the middle of the observation period. (Reviewer-Luc Jasmin, MD).

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Keywords: Cerebral Palsy, Dystonia, Head Injury, Spasticity, Intrathecal Therapy

Print Tag: Refer to original journal article
CT May Exclude SAH Without Need for LP

Determining the Sensitivity of Computed Tomography Scanning in Early Detection of Subarachnoid Hemorrhage.
Cortnum S, Sørensen P, et al:

Neurosurgery 2010; 66 (May): 900-903

In the first 3 days after symptom onset, a negative head CT alone is sufficient to exclude subarachnoid hemorrhage without having to perform a LP.

Background: Aneurysmal-subarachnoid hemorrhage (SAH) is correlated with high morbidity and mortality. Early identification of the bleed is critical as it leads to better outcomes. The current guidelines for patients with suspected SAH involves obtaining a head CT first, followed by a lumbar puncture (LP) if the latter does not show the hemorrhage. When the LP is done, the presence of xanthochromia confirms SAH. At the time these guidelines were generated, CT scan machines were less sensitive in detecting SAH (93% to 95% within 24 hours of the event and 85% at 3 days), and LP was obligatory to rule out this disease. The current CT scan machines are more technologically advanced and, therefore, may detect SAH with greater sensitivity.

Objective: To assess the sensitivity of current CT scan machines in detecting SAH, and to evaluate the necessity of using LP as a diagnostic tool to rule out this disease.

Design/Methods: This retrospective study evaluated all patients referred to the authors’ institution with a suspicion of SAH or with diagnosed SAH over a 5-year period. Medical records, CT scans, angiography, and CSF results were all reviewed. CT scanners were constantly upgraded throughout the study period according to the latest technology. Patients in whom the head CT did not detect SAH underwent LP, and the CSF was studied for cell counts and xanthochromia by spectrophotometry. No LP was done prior to 12 hours from symptom onset. Complications related to LP that extended hospital stay or necessitated readmission were recorded.

Results: 510 patients were admitted, and 499 were included in the study. Of these, 203 patients had a negative head CT and LP; therefore, SAH was ruled out. SAH was identified in 296 patients (by CT in 295 patients and by LP on day 6 in 1 patient). CT scan sensitivity and specificity for the first 5 days was 100%. Overall, the sensitivity was 99.7%, and the specificity was 100%. Complications related to LP, namely spinal headaches, occurred in 7.4% of patients.

Conclusions: CT is an excellent method to evaluate patients with suspected SAH. The authors recommend that, in the first 3 days, a negative head CT alone is sufficient to exclude SAH without having to perform LP. The CT, however, should be read by a neurosurgeon or a neuroradiologist. After 3 days, an LP is necessary if the CT is negative.

Reviewer’s Comments: This study tackles an important clinical subject, and the results are very interesting. As reported, the usual guidelines indicate that patients suspected of having SAH should undergo LP if the head CT is negative. Nonetheless, these results show that it is safe to rely solely on a negative head CT in the first 3 days to exclude SAH. Adopting such a protocol may minimize spurious diagnoses based on traumatic LPs performed by inexperienced hands, which may lead to further unnecessary work-up. (Reviewer-Ziad A. Hage, MD).

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Keywords: CT, Lumbar Puncture, Subarachnoid Hemorrhage

Print Tag: Refer to original journal article