

similar to those with lesions of the deep cerebellar nuclei. Vascular topography and involvement of deep cerebellar nuclei are the chief factors that determine the cerebellar cognitive profile. The findings support a model in which sequencing is the basic function of the cerebellum. (Tedesco AM, Chirocozzi FR, Clausi S, Lupo M, Molinari M. The cerebellar cognitive profile. *Brain* Dec 2011;134:3669-3683). (Respond: Marco Molinari MD PhD, Neurorehabilitation Santa Lucia Foundation, Via Ardeatina, 306 00179 Roma, Italy. E-mail: m.molinari@hsantalucia.it).

COMMENT. The cerebellar cognitive affective syndrome includes impairments in executive functions, spatial cognition, language and personality changes in patients with cerebellar pathologies. In addition to executive function impairments, visuospatial functions, working memory, verbal memory, linguistic processing, verbal fluency, attention, sequencing and emotion are involved. This study including a large number of patients with cerebellar pathology provides a more comprehensive description of the variety and localization of cerebellar lesions and the specific type of cognition affected, especially sequencing. Subjects with lesions in the posterior inferior cerebellar artery territory and lesions in the deep cerebellar nuclei of the posterior lobe (dentate, emboliform, fastigial, globose nuclei) exhibit the worst cognitive patterns. Cerebellar lesions do not eliminate cognitive function, but they impair motor and mental task performance, causing a “dysmetria of thought.” (Schmahmann JD and Sherman JC. The cerebellar cognitive affective syndrome. *Brain* 1998;121:561-579).

## LANGUAGE IMPAIRMENT AND ARACHNOID CYSTS

Researchers at the Universite Catholique de Louvain, Brussels, Belgium, and Universite de Sherbrooke, Quebec, Canada studied 2 patients presenting with arachnoid cysts associated with cognitive impairment., particularly language impairment. Patient 1, a 6-year-old, right-handed boy had a large head, articulation and phonology anomalies, and a normal intelligence. MRI revealed a left temporal lobe arachnoid cyst, and PET scan showed decreased metabolism in the left superior temporal gyrus and thalamus. A 24 hour-EEG was normal. A cysto-peritoneal shunt was placed at age 6 years. Postoperative MRI, 2 months after surgery, showed disappearance of the cyst and full re-expansion of the temporal lobe parenchyma. PET at 21 months postoperatively revealed a normal symmetric temporal lobe signal. The boy’s phonology improved and was normal at 12 months postoperatively. Neuropsychological assessment repeated from 6 to 70 months postoperatively revealed language and attention span improvements, and an increase in full-scale IQ from 93 to 112, with no learning disabilities evident.

Patient 2, a 7-year-old, right-handed boy was admitted for chronic headaches of increasing intensity, associated with occasional vomiting. Neurologic exam was normal. Neuropsychological evaluation showed attention deficits, deficits in verbal comprehension, speech and syntactic, and in word definitions. Full scale IQ was normal. MRI at age 8 years showed a large arachnoid cyst at the base of the left sylvian fissure, causing a mass effect on the temporal lobe. 24 hour-EEG showed rare bursts of generalized spike and wave activity. A cysto-peritoneal shunt relieved the headaches and reduced the cyst volume. Postoperative EEG was similar to the original. Neuropsychological re-examination at 6 months showed improved verbal comprehension

and attention. IQ remained the same, with verbal IQ of 98 and performance IQ of 105. (Laporte N, De Volder A, Bonnier C, Raftopoulos C, Sebire G. Language impairment associated with arachnoid cysts: Recovery after surgical treatment. **Pediatr Neurol** Jan 2012;46:44-47). (Respond: Dr Sebire, E-mail: [Guillaum.Sebire@USherbrooke.ca](mailto:Guillaum.Sebire@USherbrooke.ca)).

COMMENT. The authors consider the following as evidence of cause and effect between the surgery and cognitive improvement: 1) close temporal relationships; 2) PET increased metabolic activity in the affected temporal lobe after surgery; and 3) a correlation between the language impairment profiles and the location of the mass effect. A syndrome of temporal lobe arachnoid cyst and ADHD is further evidence supporting an association between these cysts and attention and behavioral disorders. Treatment is usually conservative, relying on medications, academic and behavioral modifications.

## TRAUMATIC BRAIN DISORDERS

### **CEREBRAL BLOOD FLOW ALTERATIONS WITH CONCUSSION**

Researchers at Cincinnati Children's Hospital Medical Center, OH evaluated 12 children, ages 11 to 15 years, following sports-related concussion (SRC), employing ImpACT neurocognitive testing, T1 and susceptibility weighted MRI, diffusion tensor imaging, proton MR spectroscopy, and phase contrast angiography at <72 hours, 14 days, and 30 days or greater. Findings were compared to an age and gender-matched control group. ImpACT confirmed significant differences between the SRC and control groups in initial total symptom score and reaction time. Total symptom score differences resolved by 14 days and reaction time by 30 days. MRI showed no structural injury. MR spectroscopy showed no decrease in neuronal metabolite N-acetyl aspartate or elevation of lactic acid. In contrast, reduction in cerebral blood flow (CBF) was documented in the SRC group (38 vs 48 ml/100 g/min, P=.027). Improvement in CBF toward control values occurred in only 27% of participants at 14 days and in 64% at >30 days after SRC. Pediatric SRC impairs CBF and produces a pathophysiologic process without causing structural or metabolic brain damage. Altered CBF may contribute to SRC-related symptoms and altered neurologic and neuropsychiatric function. A prescription of cognitive rest in patients with reduced CBF is thought to promote recovery from SRC by reducing cerebral metabolic demand. (Maugans TA, Farley C, Altaye M, Leach J, Cecil KM. **Pediatrics** January 2012;129:28-37). (Respond: Todd Maugans MD, Division of Pediatric Neurosurgery, Cincinnati Children's Hospital Medical Center, MLC 2016, 3333 Burnet Ave, Cincinnati, OH 45229. E-mail: [todd.maugans@cchmc.org](mailto:todd.maugans@cchmc.org)).

COMMENT. Sports-related concussion in children may cause a significant reduction in cerebral blood flow without measurable structural or metabolic neuronal injury. These findings differ from adults who demonstrate cerebral metabolic changes following sports-related head trauma. (Vagnozzi R et al. **Brain** 2010;133(11):3232-3242, cited by authors). In the February issue of **Pediatrics** (2012;129(2):e494-5), Levin HS commenting on two current studies (Crowe LM et al and Anderson V et al) finds in children with TBI there are limits to neuroplasticity of the young brain and a high risk of persisting deficits. Children with early TBI do not "grow into their deficit."