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Author(s) A.B. Storrow, K. Wrenn, K. de Gans, M.D. Vergouwen, Y.B. Roos , M.
 Sherlock, A. Agha, C.J. Thompson, N.A. Tritos
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Finally, Figure 3 of our article, which showed a superior location of the septum primum, and Figure 1, in which the septum primum appeared in an inferior position, may seem to be discordant. What appear to be two different locations are not the result of an error but instead are attributable to the semicircular, three-dimensional structure of the septum primum.

Jorge R. Kizer, M.D.

Richard B. Devereux, M.D.

Weill Medical College of Cornell University
New York, NY 10021
jok2007@med.cornell.edu

1. Capan LM, Miller SM. Monitoring for suspected pulmonary embolism. *Anesthesiol Clin North America* 2001;19:673-703.
2. Meacham RR III, Headley AS, Bronze MS, Lewis JB, Rester MM. Impending paradoxical embolism. *Arch Intern Med* 1998;158:438-48.
3. Droste DW, Silling K, Stypmann J, et al. Contrast transcranial Doppler ultrasound in the detection of right-to-left shunts: time window and threshold in microbubble numbers. *Stroke* 2000;31:1640-5.
4. Kerr AJ, Buck T, Chia K, et al. Transmitral Doppler: a new transthoracic contrast method for patent foramen ovale detection and quantification. *J Am Coll Cardiol* 2000;36:1959-66.
5. Sloan MA, Alexandrov AV, Tegeler CH, et al. Assessment: transcranial Doppler ultrasonography: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology* 2004;62:1468-81.

Aneurysmal Subarachnoid Hemorrhage

TO THE EDITOR: The article by Dr. Suarez and colleagues (Jan. 26 issue)¹ includes the statement that “a good-quality head CT [computed tomographic] scan will reveal subarachnoid hemorrhage in 100 percent of cases within 12 hours after the onset of symptoms and in more than 93 percent of cases within 24 hours.” One of us was a coauthor of the study cited in support of this statement,² and we believe its findings were misrepresented. Although their study certainly supports this observation, its authors did not analyze or report sensitivity within 12 hours. We are not aware of data supporting a 100 percent sensitivity for any CT scanning within 12 hours.

Although the algorithm of the authors clearly indicates the need for lumbar puncture after a negative CT scan, the sentence quoted above could be misinterpreted to mean that further testing (lumbar puncture, CT angiography, or cerebral angiography) is not indicated after a negative CT scan within 12 hours after the onset of symptoms.

Alan B. Storrow, M.D.

Keith Wrenn, M.D.

Vanderbilt University Medical Center
Nashville, TN 37232-4700
alan.storrow@vanderbilt.edu

1. Suarez JJ, Tarr RW, Selman WR. Aneurysmal subarachnoid hemorrhage. *N Engl J Med* 2006;354:387-96.
2. Sames TA, Storrow AB, Finkelstein JA, Magoon MR. Sensitivity of new-generation computed tomography in subarachnoid hemorrhage. *Acad Emerg Med* 1996;3:16-20.

TO THE EDITOR: In their review on aneurysmal subarachnoid hemorrhage, Suarez et al. recommend several diagnostic and treatment procedures

that are not in accordance with current evidence. On the basis of data from a retrospective study,¹ the authors conclude that a good-quality CT scan within 12 hours will reveal subarachnoid hemorrhage in 100 percent of cases. However, such a statement might lead readers not to perform a diagnostic lumbar puncture. A prospective study clearly demonstrated that 2 percent of cases will be missed by relying on a CT scan only.² The authors also recommend the four-tube method for the red-cell count to differentiate between a traumatic tap and a subarachnoid hemorrhage, but this test has proved to be obsolete.³

Koen de Gans, M.D.

Mervyn D. Vergouwen, M.D.

Yvo B. Roos, M.D., Ph.D.

Academic Medical Center
1105 AZ Amsterdam, the Netherlands
k.degans@amc.uva.nl

1. Sidman R, Connolly E, Lemke T. Subarachnoid hemorrhage diagnosis: lumbar puncture is still needed when the computed tomography scan is normal. *Acad Emerg Med* 1996;3:827-31.
2. van der Wee N, Rinkel GJ, Hasan D, van Gijn J. Detection of subarachnoid haemorrhage on early CT: is lumbar puncture still needed after a negative scan? *J Neurol Neurosurg Psychiatry* 1995;58:357-9.
3. Buruma OJ, Janson HL, Den Bergh FA, Bots GT. Blood-stained cerebrospinal fluid: traumatic puncture or haemorrhage? *J Neurol Neurosurg Psychiatry* 1981;44:144-7.

TO THE EDITOR: Recent studies^{1,2} have shown that dysfunction of the hypothalamic-pituitary axis is common after subarachnoid hemorrhage, with corticotropin deficiencies occurring in 2.5 to 40 percent and growth hormone deficiency occurring in 20 to 25 percent of subjects tested 3 to 66 months after subarachnoid hemorrhage. Untreat-

ed corticotropin and growth hormone deficiency have important implications³ that may hinder recovery from subarachnoid hemorrhage.

The case of a patient we encountered who had hyponatremia (plasma sodium level, 122 mmol per liter) and hypotension that developed six days after subarachnoid hemorrhage illustrates the clinical significance of post-aneurysmal hypopituitarism. The serum cortisol level was less than 5 μ g per deciliter, and corticotropin was undetectable despite acute illness and hypotension. Treating the acute corticotropin deficiency with intravenous hydrocortisone resulted in rapid normalization of blood pressure and the plasma sodium concentration. Hypopituitarism is an underdiagnosed cause of complications after subarachnoid hemorrhage that must be recognized and treated.

Mark Sherlock, M.B.

Amar Agha, M.D.

Christopher J. Thompson, M.D.

Beaumont Hospital
Dublin D9, Ireland

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1. Aimaretti G, Ambrosio MR, Di Somma C, et al. Traumatic brain injury and subarachnoid haemorrhage are conditions at high risk for hypopituitarism: screening study at 3 months after the brain injury. *Clin Endocrinol (Oxf)* 2004;61:320-6.
2. Kreitschmann-Andermahr I, Hoff C, Saller B, et al. Prevalence of pituitary deficiency in patients after aneurysmal subarachnoid hemorrhage. *J Clin Endocrinol Metab* 2004;89:4986-92.
3. Vance ML. Hypopituitarism. *N Engl J Med* 1994;330:1651-62. [Erratum, *N Engl J Med* 1994;331:487.]

TO THE EDITOR: In their review article on aneurysmal subarachnoid hemorrhage, Suarez et al. mention hyponatremia as a possible complication, but they do not mention pituitary dysfunction. Diabetes insipidus has been reported in patients after the clipping of an anterior communicating aneurysm with or without previous hemorrhage.^{1,2} Such patients frequently have hypodipsia or adipsia as a result of damage to the hypothalamic osmoreceptors and are at risk for life-threatening hypernatremia, since increasing their fluid intake does not compensate for the polyuria caused by diabetes insipidus. Timely recognition of this complication is critical and should lead to therapy with desmopressin, a prescription for scheduled fluid intake, and close monitoring of the volume and electrolyte status to maintain euvoemia.

In addition, anterior hypopituitarism has been detected in varying degrees in 47 to 55 percent

of patients who survive aneurysmal subarachnoid hemorrhage.^{3,4} Evaluation of anterior pituitary function followed by replacement therapy as appropriate should be performed routinely to minimize excess morbidity and mortality associated with hypopituitarism.

Nicholas A. Tritos, M.D., D.Sc.

Lahey Clinic Medical Center
Burlington, MA 01805
nicholas.a.tritos@lahey.org

1. McIver B, Connacher A, Whittle I, Baylis P, Thompson C. Adipic hypothalamic diabetes insipidus after clipping of anterior communicating artery aneurysm. *BMJ* 1991;303:1465-7.
2. Nguyen BN, Yablon SA, Chen CY. Hypodipsic hypernatremia and diabetes insipidus following anterior communicating artery aneurysm clipping: diagnostic and therapeutic challenges in the amnesic rehabilitation patient. *Brain Inj* 2001;15:975-80.
3. Dimopoulou I, Kouyialis AT, Tzanella M, et al. High incidence of neuroendocrine dysfunction in long-term survivors of aneurysmal subarachnoid hemorrhage. *Stroke* 2004;35:2884-9.
4. Kreitschmann-Andermahr I, Hoff C, Saller B, et al. Prevalence of pituitary deficiency in patients after aneurysmal subarachnoid hemorrhage. *J Clin Endocrinol Metab* 2004;89:4986-92.

THE AUTHORS REPLY: Two of these letters question the sensitivity that we cited for the CT scan of the head for the diagnosis of subarachnoid hemorrhage. We agree with Storrow and Wrenn that their study did not address head CT-scan sensitivity within 12 hours after the onset of symptoms.¹ Rather, Sidman et al.² reported that a head CT scan performed within 12 hours after presentation would detect subarachnoid hemorrhage in all patients. We apologize for this misrepresentation.

Storrow and Wrenn, as well as de Gans et al., also argue that our interpretation of the sensitivity of the head CT scan might lead readers to believe that no further testing would be needed to complete the diagnostic investigation. We disagree. As clearly stated in our diagnostic algorithm and in the text of our article, we recommend that in the presence of a history suggestive of typical or atypical subarachnoid hemorrhage, all patients with a normal head CT scan should undergo a lumbar puncture. We have also indicated that cerebrospinal fluid findings that are suggestive of subarachnoid hemorrhage include elevated opening pressure, xanthochromia, and an elevated red-cell count that does not diminish from tube 1 to tube 4. Practitioners should carefully determine the presence or absence of all these abnormalities in light of the clinical presentation before deciding on further diagnostic testing.

We disagree with de Gans et al. with respect to the four-tube method. This test can still be useful within the first few hours after subarachnoid hemorrhage, when xanthochromia has not yet developed.

We thank Sherlock et al. and Tritos for pointing out the importance of dysfunction of the hypothalamic–pituitary axis in patients after subarachnoid hemorrhage. We agree that recognizing and treating endocrinologic abnormalities may be important. As we mentioned in the text, virtually every patient has medical complications, which may be severe in 40 percent of cases. Such complications include hypopituitarism. Because

of space limitations, we commented on the most common medical issues only.

Jose I. Suarez, M.D.
Robert W. Tarr, M.D.
Warren R. Selman, M.D.
University Hospitals of Cleveland
Cleveland, OH 44106
jose.suarez@uhhs.com

1. Sames TA, Storrow AB, Finkelstein JA, Magoon MR. Sensitivity of new-generation computed tomography in subarachnoid hemorrhage. *Acad Emerg Med* 1996;3:16-20.
2. Sidman R, Connolly E, Lemke T. Subarachnoid hemorrhage diagnosis: lumbar puncture is still needed when the computed tomography scan is normal. *Acad Emerg Med* 1996;3:827-31.

Lead Shot in the Appendix

TO THE EDITOR: Cox and Pesola (Dec. 29 online issue)¹ describe lead-shot accumulation in the cecal appendix of an Alaskan native, which was probably caused by the ingestion of shotgun-culled waterfowl. Their description did not mention the potential for lead absorption and systemic toxicity. Blood lead levels almost twice those of controls may be found after sequestration of just one or two shot pellets in the appendix²; a toxic level of lead (67.4 μg per deciliter) was reported after the retention of 29 pellets.³ The authors' comment that shot in the appendix is commonly seen in Alaskan natives suggests an important public health concern. Presentations of adult lead poisoning (plumbism) range from nonspecific symptoms to acute encephalopathy. Children absorb lead more readily than do adults, which can result in reduced IQ; the fetus is particularly susceptible. Interventions include screening, medical management, public health education, and promotion of the use of steel shot instead of lead. Within the indigenous community, reduced lead levels would confer substantial health benefits.

Leo J. Schep, Ph.D.
John S. Fountain, M.B., Ch.B.

National Poisons Centre
Dunedin 9001, New Zealand
john.fountain@otago.ac.nz

1. Cox WM, Pesola GR. Buckshot ingestion. *N Engl J Med* 2005; 353:e23 (Web only). (Available at www.nejm.org/cgi/content/full/353/26/e23.)

2. Madsen HH, Skjodt T, Jorgensen PJ, Grandjean P. Blood lead levels in patients with lead shot retained in the appendix. *Acta Radiol* 1988;29:745-6.

3. Durlach V, Lisovoski F, Gross A, Ostermann G, Leutenegger M. Appendectomy in an unusual case of lead poisoning. *Lancet* 1986;1:687-8.

THE AUTHORS REPLY: In 1991, the United States instituted a nationwide ban on lead shot for waterfowl hunting, owing in part to the concern regarding lead toxicity from this practice. Unfortunately, the ban does not extend to all hunting; thus, there is a risk to hunters and others who inadvertently eat lead from their catch.¹ Countries such as Denmark and the Netherlands have a complete ban on lead for hunting; alternatives to lead shot include bismuth, steel, tin, and tungsten. Therefore, a solution to lead ingestion and potential toxicity problems is present.

As Schep and Fountain suggest, it is reasonable to screen for lead when shot is found in the appendix during radiography. If an elevated lead level is found, appropriate action should be taken. We did not know the blood lead level in the patient in our report, since she had been sent for radiography some years earlier. In the future, all such testing will include a suggestion to obtain a lead level in similar clinical situations.

William M. Cox, M.D.
Norton Sound Regional Hospital
Nome, AK 99762

Gene R. Pesola, M.D., M.P.H.
Mailman School of Public Health
New York, NY 10032

1. Gustavsson P, Gerhardsson L. Intoxication from an accidentally ingested lead shot retained in the gastrointestinal tract. *Environ Health Perspect* 2005;113:491-3.