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Thallium-201 Single-Photon Emission CT in Recurrent Squamous Cell Carcinoma of the Head and Neck

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We fully agree with the authors that MR imaging should be repeated when patients are not responsive or have recurrent hypertension. However, there is still controversy regarding whether MR imaging is a reliable tool for screening patients with essential hypertension for neurovascular contact. In this context, it is noteworthy that "positive" MR imaging findings (neurovascular contact of the vertebral artery with the left medulla oblongata) are not required for inclusion in an ongoing multicenter clinical trial of microvascular decompression for essential hypertension (4).

A substantial amount of work and research are needed to explore the true clinical effect of microvascular decompression for neurovascular hypertension. In the meantime, Gizewski et al are to be congratulated on their important and inspiring findings.

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References

1. Gizewski ER, Spitthöver RM, Wiedemayer H, Wanke I, Philipp T, Forsting M. **Recurrent neurovascular hypertension: MR findings before and after surgical treatments.** *AJNR Am J Neuroradiol* 2001; 22:1168–1170
2. de Seze J, Mastain B, Stojkovic T, et al. **Unusual MR findings of the brain stem in arterial hypertension.** *AJNR Am J Neuroradiol* 2000; 21:391–394
3. McLaughlin MR, Jannetta PJ, Clyde BL, Subach BR, Comey CH, Resnick DK. **Microvascular decompression of cranial nerves: lessons learned after 4400 operations.** *J Neurosurg* 1999;90:1–8
4. Levy EI, Scarrow AM, Jannetta PJ. **Microvascular decompression in the treatment of hypertension: review and update.** *Surg Neurol* 2001;55:2–11

Reply

We thank Drs. Menovsky and de Vries for their interest and comments regarding our article (1). From the surgical point of view, our reported case was an unusual case of neurovascular compression.

Because the vertebral artery was extremely ectatic, it was impossible to achieve adequate decompression of the lateral medulla oblongata by means of conventional techniques, such as interposing an implant. In both the first and second surgeries, we used a Teflon sling to transpose the vertebral artery away from the medulla oblongata. Our technique was similar to that described by Bejjani and Sekar (2). In the first procedure, the sling was fixed to the petrosal dura by using an ethilone suture. In the second procedure, which confirmed recurrent neurovascular compression, the sling was fixed transdurally to the occipital bone to achieve a more profound dorsally directed retraction. Despite these technical difficulties, we think that surgical decompression is the first choice and that occlusion or resection of a vessel is justified only in cases of failure (3).

Concerning the second-mentioned point, we agree that brain stem edema in neurovascular hypertension is an uncommon finding. We wanted to emphasize, however, that among those patients with initial brain stem edema, this aspect can be used for follow-up control and decision for reintervention in cases of recurrent edema.

Brain stem edema without vascular compression published by de Seze et al (4) was different from that in our patient. The edema in our case had close relation to the vertebral artery and did not involve the entire brain stem. We agree that edema in the brain stem may result in blood pressure dysregulation independent of the cause.

As Menovsky and de Vries note, edema as a cause of chronic pulsation, such as giant aneurysm, resolves after occlusion of the artery. We emphasize that vascular occlusion might be a possible treatment for neurovascular hypertension. This way, the pulsation is eliminated, and the vascular compression of the brain stem is diminished. In our case, vertebral artery occlusion was an unintended result but without severe neurologic complications. The primary intervention was the surgical fixation of the artery.

We also agree with Menovsky and de Vries that "positive" MR imaging findings with close contact of arteries to the brain stem are controversial. Therefore, the group of patients with initial edema, as reported in our case, represent a rare group with a potential benefit from presurgical MR imaging workup.

References

1. Gizewski ER, Spitthöver RM, Wiedemayer H, Wanke I, Philipp T, Forsting M. **Recurrent neurovascular hypertension: MR findings before and after surgical treatments.** *AJNR Am J Neuroradiol* 2001; 22:1168–1170
2. Bejjani GK, Sekhar LN. **Repositioning of the vertebral artery as treatment for neurovascular compression syndromes: technical note.** *J Neurosurg* 1997;86:728–732
3. Hongo K, Nakagawa H, Morota N, Isobe M. **Vascular compression ot the medulla oblongata by the vertebral artery: report of two cases.** *Neurosurgery* 1999;45:907–910
4. de Seze J, Mastain B, Stojkovic T, et al. **Unusual MR findings of the brain stem in arterial hypertension.** *AJNR Am J Neuroradiol* 2000; 21:391–394

Thallium-201 Single-Photon Emission CT in Recurrent Squamous Cell Carcinoma of the Head and Neck

We read with interest the report by Mukherji et al (1) concerning the use of thallium-201 single-photon emission CT to detect primary squamous cell carcinoma of the head and neck. The authors clearly show that high accuracy is obtained for thallium-201 single-photon emission CT in the differential diagnosis of recurrent tumor versus treatment effect in this tumor group, surpassing the reliability of CT in detecting this problem. We bring to the attention of your readers our work (2), which suggests another potentially important area of diagnostic benefit from thallium-201, specifically the ability to obtain prognostic information concerning the expected biological aggressivity of a childhood brain tumor. Abnormal thallium-

201 uptake in this population appeared to denote a subgroup of lesions with distinctly greater mortality and morbidity. Thallium-201-avid lesions showed a 50% shorter period of recurrence-free survival from the time of diagnosis ($P < .01$). These findings exceeded the specificity of correlated structural imaging, mainly MR imaging. It would be of interest to know whether Dr. Mukherji and colleagues found any similar trends with respect to the different groups of cancer of the head and neck.

Both the University of North Carolina and our study thus suggest that the widely available and relatively inexpensive agent, thallium-201, provides important functional information regarding the biological behavior of brain tumors, which cannot generally be gleaned from the structural imaging findings alone. If confirmed in further clinical experience, this information has great potential benefit and may influence patient counseling regarding long-term outcome and be useful in the selection of the best treatment protocols.

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References

1. Mukherji SK, Gapany M, Phillips D, et al. **Thallium-201 single-photon emission CT versus CT for the detection of recurrent squamous cell carcinoma of the head and neck.** *AJNR Am J Neuroradiol* 1999;20:1215–1220
2. O'Tuama LA, Poussaint TY, Anthony DC, Treves ST. **Childhood brain tumor: neuroimaging correlated with disease outcome**. *Pediatr Neurol* 1998;19:259–262

Reply

We thank Drs. O'Tuama and Poussaint for their interest in our work (1). Our study group consisted of patients with recurrent tumors and not primary neoplasms. Thus, we did not have the ability to investigate the prognostic capability of thallium-201 before treatment. It would have been difficult to draw any such conclusions from our patient population, because we evaluated previously treated patients for recurrent disease and the effect of thallium uptake after various forms of treatment had not been sufficiently investigated.

Drs. O'Tuama and Poussaint raise a potentially important use of thallium with respect to predicting treatment response and potentially stratifying treatment regimens on the basis of objective quantitative criteria. I would call their attention to the work of Nagamachi et al (2, 3). This group performed a semiquantitative measurement of thallium-201 to predict the response of squamous cell carcinoma of the head and neck to radiation therapy. The measurements consisted of a thallium-201 retention index; the details of this technique are described in their articles. Nagamachi et al (3) found that the pretreatment retention index was predictive of response to radiation therapy. A high retention index was predictive of $\geq$50% reduction in size of the primary site (complete or partial response), whereas a low retention index was predictive of <50% response (3). We have recently evaluated the ability of combined pre- and post-thallium-201 to predict response in squamous cell carcinoma of the head and neck treated with nonsurgical organ preservation therapy (4). Our preliminary results showed that persistence of activity in the primary site at 6 weeks after completion of therapy was indicative of persistent tumor, whereas loss of uptake was indicative of local control (4). We did not, however, quantify the pretreatment thallium uptake of the tumors in this report (4). This is something we can certainly consider investigating in future studies to shed more light on the insightful inquiry presented by Drs. O'Tuama and Poussaint.

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References

1. Mukherji SK, Gapany M, Phillips D, et al. **Thallium-201 single-photon emission CT versus CT for the detection of recurrent squamous cell carcinoma of the head and neck**. *AJNR Am J Neuroradiol* 1999;20:1215–1220
2. Nagamachi S, Hoshi H, Jinnouchi S, et al. **201TL SPECT for evaluating head and neck cancer.** *Ann Nucl Med* 1996;10:105–111
3. Nagamachi S, Jinnouchi S, Flores LG, et al. **The use of 201T1 SPET to predict the response to radiotherapy in patients with head and neck cancer.** *Nucl Med Commun* 1996;17:935–942
4. Mukherji SK, Gapany M, Neelon B, McCartney W. **Evaluation of 201T1 SPECT for predicting early treatment response in patients with squamous cell carcinoma of the extracranial head and neck treated with nonsurgical organ preservation therapy: initial results.** *J Comput Assist Tomogr* 2000;24:146–151

Atraumatic Lumbar Puncture

Eskey and Ogilvey (1) conclude that the use of fluoroscopically guided lumbar punctures in patients with suspected subarachnoid hemorrhage should reduce the incidence of false-positive diagnoses of acute hemorrhage and therefore the number of unnecessary angiographic procedures. The authors may wish to consider another method of obtaining a lumbar puncture based on the experience of those of us who carried out pneumoencephalography before the days of CT. With the patient sitting erect and bending forward over a pillow on his or her lap, the interspinous distances are increased. An accurate midsagittal approach is easily ascertained and access to the subarachoid space is atraumatic and simple. I would submit that this method leads to fewer false-positive results than those of the usual bedside lateral decubitus approach and is less time-