

Large Bolus Radionuclide Esophageal Transit May Predict Response to Esophageal Dilatation in Achalasia

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TO THE EDITOR: In the clinicopathological conference, "Esophageal Scintigraphy in Achalasia and Achalasia-like Disorders," in the April issue of the *Journal*, it is stated that "It would appear that a primary role for esophageal scintigraphy would be in following the long-term response of patients with achalasia and comparing the scintigraphic findings to other clinical parameters, including symptoms. Unfortunately, no such long-term study critically assessing this role has been reported" (1). However, our study published in 1991 (2) discussed the predictive role of radionuclide esophageal transit in patients with achalasia.

We performed small (10 ml) and large (140 ml) bolus esophageal transit studies using a liquid tracer in 31 patients with achalasia who were undergoing pneumatic dilatation in an attempt to predict subsequent clinical response to the procedure. Thirty-three paired studies were performed immediately before and one day following dilatation, and clinical response was assessed at 1 mo. The large bolus studies accurately predicted the clinical response in 30/33 cases (91%), while small bolus studies were correct in 19/31 (58%) ($p < 0.01$). The reason for performing a study before discharge is that many of our patients may have to travel long distances (up to 500 km) for the procedure, and it is therefore advantageous to be able to predict who will need to undergo redilatation before discharge. While our paper reported clinical follow-up at 1 mo, the results at 6 mo were identical.

Our technique was a modification of that previously reported by Oei et al. (3) and Akkermans et al. (4) who used a large liquid bolus as opposed to the standard small bolus in patients with achalasia. The rationale is that in such patients, the effect of gravity, which is not normally an important factor in esophageal transit, is important in aiding passage through a hypomotile esophagus and hypertensive esophageal sphincter. Similar results have been found by Robertson et al. (5).

Our study demonstrates that the standard small bolus study is relatively insensitive in predicting response to dilatation, however, when using a large bolus and comparing transit immediately before and one day following dilatation, the procedure had an accuracy of 0.91 (positive predictive value 0.95, negative predictive value 0.82). We feel that in the management of patients with achalasia, large bolus esophageal transit studies are the preferred technique.

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REPLY: This is interesting work, however, the published data on this paper reports clinical follow-up at 1 mo. This is a short-term follow-up, not a long term follow-up. My statement that "no such long-term study critically assessing this role has been reported" is accurate. The finding that the results at 6 mo were similar to the results at 1 mo is of interest and it would be important to follow these patients further and subsequently publish this data.

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Technical Considerations in the Handling of a Cadaver Having Received Radioiodine Prior to Death

TO THE EDITOR: While a 41-yr-old white male patient with known thyroid cancer was worked up for possible uptake by metastases with a whole-body radioiodine (NaI-131) study (WBS), the patient died from an unknown cause. He had received 5 mCi (185 MBq) NaI-131, p.o., approximately 4 hr prior to death.

The patient had been admitted to the hospital complaining of low back pain radiating to his lower extremities. A bone scan obtained the day after admission showed abnormal uptake at L-3 as well as in the right temporo-parietal area of the skull. A CT scan following the bone scan showed two axial lesions: one just below the calvarium in the right temporo-parietal area, and another smaller lesion in the left thalamus.

Although a rare occurrence, the possibility of edema or hemorrhage due to functioning metastases in the brain should be avoided by prior elimination of function in these metastases using external beam radiation. After x-ray therapy (XRT), one can proceed with radioiodine therapy (1).

The patient was treated with whole brain radiation (30 Gy in 12 fractions). Ten days later the patient received the 5 mCi radioiodine WBS dose. Since the patient was considered to be at high risk by the extent of his disease, a Memorial Sloan-Kettering dosimetric protocol was begun (2). When the patient did not return for his body burden measurement 4 hr after receiving the dose of radioiodine, it was learned that he had been found in full arrest in his room and had been pronounced dead by the code team. Although the patient was found in asystole and without spontaneous respiration, the team leader noted the presence of bowel sounds at the time he examined the patient while responding to the code.

The hospital was faced with two problems: an unknown cause of death requiring an autopsy and the control of potential internal contamination of staff from the previously administered 5 mCi of NaI-131. The radiation exposure levels were measured on

contact and at one m; the readings were 2.0–7.0 mR/hr and 1.0–5.0 mR/hr, respectively. A quick review of the literature revealed that this situation was unprecedented; a call to an NRC regional office was made to request guidance in handling of the cadaver and monitoring of personnel performing the autopsy.

The advice received from NRC was as follows: the radiation safety officer (RSO) was to instruct the staff performing the autopsy on the potential hazards of exposure to ionizing radiation, these individuals were to receive radiation monitors to record their exposure and autopsy personnel were to be advised as to the importance of adequate flushing with water during the procedure. Since approximately 500 gallons of water are used in the rinsing of excised organs and body cavities during an average autopsy, the dilution factor was considered adequate insofar as decreasing the body burden of radiation (most of which was localized in the abdominal area). The dilution factor also made it acceptable to flush unbound NaI-131 through the sewer system as a one time release (3).

The autopsy report stated the cause of death as exsanguination into the stomach and bowel secondary to a perforated gastric ulcer which eroded through the pancreatic artery. The patient had a past medical history of peptic ulcer disease (PUD), but after admission and consultation by radiation oncology, he was inadvertently placed on dexamethasone sodium phosphate (for possible brain edema after XRT) without adding an H2 antagonist. A higher than usual dose of steroid unopposed by H2 antagonists likely caused exacerbation of the patient's pre-existing PUD.

After the autopsy, the body was reassayed. Since exposure on contact at this time ranged from 1.0–2.0 mR/hr, the body was released to the family.

A thyroid bioassay was performed on all personnel (Radiation Safety and Pathology) exposed to the deceased patient within 48 hr of their exposure. Bioassays (thyroid counts) were performed using a collimated probe detector (Na-I (T1) crystal) interfaced with a multichannel analyzer. Readings were obtained at 15 cm from the thyroid cartilage. The obtained readings were in no instance above background radiation readings. The film badges and finger monitors that were assigned to Pathology personnel involved in the autopsy, as well as those carried by Radiation Safety staff, recorded minimal superficial exposure and detectable deep exposure.

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Acupuncture and Radioactive Pathways of Hypodermically Injected Technetium-99m

TO THE EDITOR: In our opinion, some of the interpretations of Scott (1) and Vernejoul and associates (2) are not supported by the data contained in a recently published study by our group (3). The aim of our study was to determine the specific nature and to investigate the biological substrate of radioactive migration pathways of hypodermically injected ^{99m}Tc into points of low electrical resistance. Given that the specific radioactive pathway detected was not the result of diffusion of the radiotracer through nerves, veins or lymphatic vessels, attention was drawn to the coincidence of its trajectory with that described for one of the acupuncture meridians in the dog. The methodology of our investigation was designed neither to define nor to assess the consistency of numerous philosophic principles on which the origin, development and application of procedures included under the term "acupuncture" are based. We believe that the results of our study show that further research is needed to clarify this specific spread pattern and to determine its eventual biological substrate and significance. They do not provide any data that could be used to assess the validity of the physiologic and philosophic theories from which "acupuncture" procedures arise.

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