

LOCULATION AS A CONTRAINDICATION TO

INTRACAVITARY <sup>32</sup>P-CHROMIC PHOSPHATE THERAPY

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**Loculation of instilled <sup>99m</sup>Tc-sulfur colloid solution in the peritoneal cavity was observed in a patient being considered for intracavitary therapy with <sup>32</sup>P-chromic phosphate. Since intracavitary instillation of a therapeutic dose of a radiopharmaceutical agent into a loculated space would risk therapeutic failure and tissue necrosis, prior instillation of a tracer nuclide is recommended to insure adequate dispersion before beginning such therapy.**

To determine the distribution of <sup>32</sup>P-chromic phosphate following intracavitary radiotherapy, Tully and coworkers recently proposed the simultaneous administration of <sup>99m</sup>Tc-sulfur colloid with subsequent imaging of the appropriate cavity (1). Inherent in this technique is the potential danger of instilling the <sup>32</sup>P-chromic phosphate into a loculated space since loculation would not be apparent until after the fact. In addition to the inadequate distribution of the radiocolloid and consequently the possibility of a reduced therapeutic response, a significant and potentially destructive radiation dose might be delivered to adjacent structures. For example, 10 mCi of <sup>32</sup>P-chromic phosphate instilled into a 5-cm diam sphere results in the delivery of approximately 56,000 rads to the spherical surface. Bowel forming a part of the boundary of a 5-cm diam loculated space very possibly could undergo necrosis. That loculation can occur and should be considered is illustrated by the following case report.

CASE REPORT

On Aug. 27, 1973 a 3-year-old boy was readmitted to the pediatric service for evaluation of ascites and fever. In October 1971, a diagnosis of rhabdomyosarcoma of the bladder had been made requiring resection of the bladder, a portion of rec-

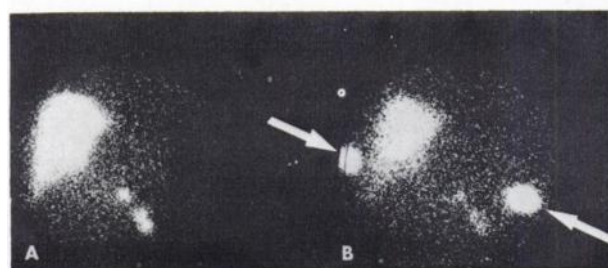
tum, and the simultaneous construction of an ileal conduit. Following surgery, the patient received a course of chemotherapy and did well until August 1973, at which time he became febrile and developed increasing abdominal girth.

On admission the abdomen was tense and distended and a fluid wave was palpable. Peritoneal tap yielded a sterile, viscous, bloody fluid that was shown to have a Class V cytology. Phosphorus-32 chromic phosphate therapy was considered and consultation with the nuclear medicine service was obtained. Phosphorus-32 therapy was considered to be appropriate provided no loculation existed.

A long plastic cannula was inserted into the abdominal cavity by the pediatric house staff and 1 mCi of <sup>99m</sup>Tc-sulfur colloid was instilled. Imaging after rotating the patient failed to show dispersion of the isotope. Imaging was performed again 2 hr later. A loculated collection of the radiocolloid and the cannula tract could be identified (Fig. 1A). Twenty-four hours later the abdomen was imaged again and

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**FIG. 1.** (A) Image of anterior abdomen 2 hr after injection of 1 mCi of <sup>99m</sup>Tc-sulfur colloid showing cannula tract and region of loculation. (B) Repeat image of anterior abdomen 24 hr after injection shows loculation and cannula tract essentially unchanged (arrows indicate abdominal wall markers).

the loculation and cannular tract appeared unchanged (Fig. 1B).

Intracavitary instillation of  $^{32}\text{P}$ -chromic phosphate was not advised and the patient was treated with chemotherapy. He improved and was discharged.

#### DISCUSSION

Loculation may result in a therapeutic failure and tissue necrosis. For these reasons we recommend

that the technique suggested by Tully, et al be modified to demonstrate adequate dispersion with  $^{99\text{m}}\text{Tc}$ -sulfur colloid prior to the instillation of  $^{32}\text{P}$ .

#### REFERENCE

1. TULLY TE, GOLDBERG ME, LOKEN MK: The use of  $^{99\text{m}}\text{Tc}$ -sulfur colloid to assess the distribution of  $^{32}\text{P}$ -chromic phosphate. *J Nucl Med* 15: 190-191, 1974