INTRACAVITARY THERAPY FOR FLUID OR NEOPLASM
(P-32 as Chromic Phosphate Colloid)

Overview

- P-32 radiocolloids may be injected into body cavities that are lined with metastases that are producing fluid. The treatment is, in general, palliative.

Indications

- Palliative reduction of fluid accumulation in serosal cavities, i.e. peritoneal, pericardial, and pleural, secondary to neoplastic disease (1-3).
- Prophylactic prevention of recurrence of neoplasm on serosal surfaces (4).
- Treatment of cystic neoplasms (5).

Procedure Time

- 30 minutes for obtaining informed consent and injecting the radiopharmaceutical.

Patient Preparation

- The patient should have a life expectancy of 3-6 months to be considered for treatment and there should be no evidence of intraperitoneal infection (1,8).
- The nuclear medicine physician explains the expected benefits and possible complications (1).
- The nuclear medicine physician obtains written informed consent.
- The bulk of the intracavitary fluid should be removed from the cavity in question prior to injection of the colloid, otherwise the colloid will be greatly diluted and the radiation effect will be reduced (1).

Materials

- 21 gauge intracatheter.
- Connecting tubing.
- Three way stopcock.
- 50 mL syringe.

- Collection bag.

θ Iodinated contrast material.

- 10 mL syringe filled with saline.

Radiopharmaceutical, Dose, & Technique of Administration

- Radiopharmaceutical: P-32 as chromic phosphate colloid (1).

- Dose (1):
  > Pleura: 10-15 mCi (370-555 MBq).
  > Peritoneum: 15-20 mCi (555-740 MBq).
  > Pericardium: 5-10 mCi (185-370 MBq).

- Technique of administration (injection is performed by the nuclear medicine physician) (1):
  1. Using aseptic technique and 1% lidocaine to anesthetize the skin, place the intracath into the cavity and secure with tape. (Ultrasound imaging may be helpful in documenting the location of ascites.)
  2. Attach a connecting tube to the intracath.
  3. Attach a three way stopcock to the connecting tube.
  4. Attach the second connecting tube to the three way stopcock.
  5. Attach the collecting bag to the free end of the connecting tube.
  6. Attach the 50 mL syringe to the stopcock and withdraw the bulk of the fluid, but not all of it (1,7).
  7. Document free flow of injected fluid within the cavity by injecting iodinated contrast material and obtaining a radiograph or by injecting Tc-99m-sulfur colloid or Tc-99m-macroaggregated albumin and acquiring a gamma camera image (7-9).
  8. Attach the syringe containing the radiopharmaceutical to the free port of the stopcock.
  9. Turn the stopcock to connect the radiopharmaceutical syringe to the patient and inject the radiopharmaceutical.
  10. Substitute the syringe containing saline for the 50 mL syringe and flush the radiopharmaceutical into the cavity.

- Following injection into the peritoneum or pleural cavity, the patient should roll from side to side and lie prone to ensure adequate distribution of the radiopharmaceutical throughout the cavity. The motion of the heart ensures adequate distribution in the pericardial cavity.

Protocol Summary Diagram

Post Treatment Restrictions

- There are no post-treatment restrictions related to radiation exposure to others.

Complications

- The following complication frequencies are best estimates from the literature.

Complication	Time of onset	Frequency (%)	Reference
Loculation of radiopharmaceutical	immediate	uncommon	7-9
Peritoneopleural migration	immediate	uncommon	10
Mild radiation sickness	< 1 wk	10	1
Small bowel obstruction	months-years	10	1

Optional Maneuvers

- Documentation of radiopharmaceutical distribution: May be done by imaging P-32 bremsstrahlung radiation (11,12).

- Measurement of cystic volume in brain neoplasms: Computed tomography is the preferred method (13).

Principle Radiation Emission Data - P-32 (14)

- Physical half-life = 14.26 days.

Radiation	Mean % per disintegration	Mean energy (keV)
Beta-1	100.0	694.9

Dosimetry P-32 as Chromic Phosphate Colloid - Intraperitoneal (1,15)

Organ	rads/10 mCi	mGy/370 MBq
Peritoneum	about 6,000	about 60,000
Liver	110	1,100
Spleen	100	1,000

Kidney	20	200

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Nuclear Medicine Department
Institution_____

Your physician has referred you for a treatment dose of radioactive phosphorus colloid for cavitary fluid &/or neoplasm . Other methods of therapy may be available, but this particular treatment is felt to be best in your situation at this time.

- θ We are attempting to slow down the rate at which the lining of your cavity forms fluid. There is an approximately 50% chance of success.

- θ We are attempting to prevent or delay the recurrence of tumor growths on the lining of your abdominal cavity. We do not have extensive information on the success rate at this time, but preliminary clinical results indicate a 30-50% success rate.

There are several possible complications. First, although uncommon, the radioactive phosphorus colloid may loculate at the time of injection and not be dispersed throughout the cavity it is injected into as planned. If this happens, the success of the treatment will be less likely. Second, there is an approximately 10% chance that the formation of adhesions may cause future intestinal obstruction in the abdomen or breathing difficulties in the chest (depending on the site of therapy). And third, there is an approximately 10% chance of self limited nausea, vomiting, and diarrhea during the first week after treatment.

Female patients who may be pregnant or who are breast feeding should not undergo this treatment. Pregnancy should be postponed for at least 3 months following treatment.

_____ _____
Patient or legal guardian Physician

_____ _____
Witness Date

REFERRAL INFORMATION

Referring physician_____ Patient name_____

Primary cancer_____ Failure of conventional therapy_____

Imaging evidence of fluid_____

Pregnancy test (females of reproductive age)_____

Comments_____

Dose of P-32 (as chromic phosphate colloid) to be ordered_____

Treatment date_____

Nuclear medicine physician_____ Today's date_____