Emulsified Pantopaque Ventriculography

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A simple method of ventriculography is presented, which has proven to be valuable in the localization of blocks of the ventricular system and in detailing the finer points of anatomy.

Method
The patient is prepared for ventriculography in the usual manner. In the supine position a cannula or a spinal needle is introduced into the ventricular system by way of the open fontanelle, coronal suture, or through a trephine opening. Ten-15 ml. of spinal fluid are removed from the ventricular system into a 20-cc. syringe containing 1.5-2.5 ml. of Pantopaque. With the needle left in place, the syringe then is separated from the needle and 5 ml. of air are introduced into the syringe. The distal orifice of the syringe is occluded with the thumb covered with sterile glove, and a fine emulsion of Pantopaque with cerebrospinal fluid is produced by vigorous shaking by hand for 3-5 min. The resulting emulsion appears homogeneous and milky. The quality of the films to be obtained is dependent directly upon obtaining a very fine emulsion, so that it must be emphasized that vigorous shaking is necessary. The prepared emulsion is introduced at a steady, rapid rate of flow into the ventricular system, so as to produce turbulence and good admixture of the emulsion throughout the patent ventricular system.

In most cases a brow-up lateral film and an anteroposterior view will show most of the details of the ventricular system. Fig. 1 is a view taken immediately at the end of the injection of the emulsion with 1-sec. exposure and shows the turbulence referred to in hydrocephalic ventricles. Fig. 2 is an anteroposterior projection taken 20 min. later in the same patient. The radiopaque coating of the ventricles is still present after 20 min. Fig. 3 shows a film taken 2-3 min. after injec-

Fig. 1. Lateral view taken in a hydrocephalic infant immediately after injection of the emulsion with 1-sec. exposure showing the effect of turbulence.

Fig. 2. Anteroposterior projection taken 20 min. after injection in the same patient. Radiopaque coating of ventricles still is present.

Fig. 3. Film taken in an adult 3 min. after injection. Note instantaneous and simultaneous filling of entire ventricular system.

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Emulsified Pantopaque is evident but the outlining of the ventricular walls, including details of the choroid plexus, is well shown. The anterior border of a tumor of the 4th ventricle is outlined. The prolonged adherence of Pantopaque to the ventricular lining allows for multiple views to be obtained over a period of at least 20 min. when necessary.

Comment

The advantages of this technique include the ability to outline the entire patent ventricular system with a single injection. Maneuvering of the head and the necessity for multiple views are reduced. The irritative disadvantages of air ventriculography are avoided. No morbidity was noted in the first 6 patients subjected to this technique. In comparing emulsified Pantopaque with radiopaque aqueous materials, the outstanding advantage is that the ventricular details are not lost because of superimposition of an excessive opacity.

Emulsified Pantopaque has been used by others for myelography. The authors have found it useful also in demonstrating the prepontine cistern and the details of the cisterns throughout the posterior fossa.

Addendum

Since submission of the paper for publication, the authors have performed 48 additional studies with this technique. The successful visualization of the ventricular system has been achieved uniformly in all cases. In 2 patients, both 13-year-old males, signs of meningeal irritation and fever of 48 hours' duration occurred. No specific therapy was required. No other complications have been observed.