EXPERIMENTAL USE OF A PREPARATION OF
ETHYL DIIODOSTEARATE
AS A CONTRAST MEDIUM FOR DIAGNOSTIC CEREBRAL ANGIOGRAPHY

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CEREBRAL angiography has become in the past decade a valuable and frequently employed adjunct to diagnosis in disorders of the central nervous system. Of the radiopaque media currently employed, each has drawbacks peculiar to its own particular chemical and pharmacologic properties. In the attempt to produce a universally acceptable radiopaque compound for use in human angiographic studies, several agents have more recently been introduced for study. One of these products, angiopac (ethyl diiodostearate), was selected by us for study. Since the drug had as yet not been certified in the United States by the United States Food and Drug Administration for clinical use, preliminary investigation of its effects on animals seemed indicated.

Angiopac is a micro-ionized aqueous emulsion of ethyl diiodostearate. The product is milky in appearance, and the particles are considered to be 2 microns in diameter or one-fifth the size of a red blood corpuscle. According to Masy, the compound is very opaque, painless on injection, well tolerated without side reactions, and rapidly eliminated by the kidneys.

The dose recommended by the manufacturer for cerebral angiography is 10 cc. per injection. Although maximal doses in man are not indicated, 40 cc. by intracarotid injection and 1 cc. per kg. by an intravenous route have been given with impunity, according to a brochure accompanying the drug.

Our interest in this product was with regard to four chief characteristics: (1) radiopacity, (2) toxicity, (3) irritant effect and persistence in tissues, such as muscle, where it might inadvertently be injected, and (4) elimination from the body.

METHOD

Carotid arteriography was carried out with angiopac in a series of 15 dogs and 5 cats. Only large animals (dogs weighing 20 kg. or more and cats weighing 4 to 5 kg. or more) were employed. All injections were made by open

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technic; anesthesia was used for all dogs except 1 whose carotid artery had been exteriorized previously. Ether, pentobarbital sodium (nembutal) or thiopental sodium (pentothal sodium) was used in the dosage that had heretofore been found satisfactory for routine operations on animals at the Institute of Experimental Medicine, Mayo Foundation. As nearly as possible, conditions identical to those of human angiographic procedures were simulated. Simultaneous polygraphic recordings of pulse rate, blood pressure, respiration and heart action were obtained from a cannula in the femoral artery, a pneumograph, and an electrocardiograph.

The dose of angiopac ranged from 0.5 cc. to 10 cc. per injection. No animal received a total of more than 20 cc. in any series of repeated injections. Two dogs received the injections into the pectoral muscle.

RESULTS

Three dogs died as the direct result of the injection of angiopac into the carotid system. Two dogs required artificial respiration and termination of the procedure. No cats died as a result of injections.

The typical reaction to the injection of angiopac in dogs was a fall in blood pressure (Fig. 1).

![Fig. 1. Polygraphic recording to show a typical response to a 10 cc. injection of angiopac in a dog weighing 20.4 kg.](image_url)

Spacing the injections at intervals of 5 minutes or more, the only dose of angiopac consistently tolerated by dogs was 3 cc. or less. The smaller amounts, 1 to 2.5 cc. were tolerated best. Larger injections, 8 to 10 cc., tended to cause critical symptoms and death. Death was usually caused by respiratory failure. Similar amounts of iodopyracet (diodrast) did not have the above-mentioned effects.

The radiographic contrast was excellent and, we believe, superior to that