

tubing should be stretched thoroughly along its length, washed through, and then boiled again. In this way chemicals and powder on the inner surface of the tubing are removed. Water used for making the intravenous solution must be freshly distilled. Glucose supplied in sterile ampoules should be employed.

Isotonic Intravenous Solutions.—The fluids most generally used are either normal saline or 5 per cent. glucose in normal saline. Horsley recommends that 10 units of insulin be added for every 500 c.cm. of 5 per cent. glucose injected. This author also praises Ringer's solution; while Gallie prefers Locke's solution. An enterprising firm of druggists should put up in ampoules (1) saline and glucose, (2) Ringer's solution, (3) Locke's solution, (4) saline and 1 per cent. mercurochrome, and all that would be necessary would be to choose the appropriate ampoule and add distilled water. If it is desired to give intravenous medication the appropriate dose is mixed with the fluid, which is poured into the supply flask. Matched citrated blood can likewise be added to the intravenous fluid, and the patient receives a transfusion, and if necessary a re-transfusion, with no more fuss and disturbance than is involved in giving him a drink.

The Temperature of the Fluid.—It is quite unnecessary to be concerned about the temperature of the fluid entering the vein. It is far better to keep the patient warm with hot bottles than to have an elaborate apparatus to maintain the temperature of the fluid in the container. Clearly, by the time any fluid has traversed the tubing it will be about room temperature on entering the vein. To place an electric heating pad upon the limb above the cannula is more rational, and far more effective than trying to maintain the infusion at blood heat.

Rate of Flow.—The average rate of flow for an adult should be about 50 drops per minute—that is, roughly, a quarter of a pint per hour. In cases in which it is necessary the rate can, for the first hour, be increased to 100 drops, after which it can be increased or decreased to suit individual requirements. The nurse should be told to keep a watch for signs of oedema under the eyes or in the limb, which is the signal that the amount of fluid entering the vein should be reduced.

How Long can Venoclysis be Continued?—Three, four, or five days is quite usual. It is not exceptional to have the apparatus working satisfactorily for a week. After the fourth day redness over the vein, extending for a few inches above the site of the injection, may be expected. This should cause no alarm, for it is a chemical phlebitis, which settles down in a few days after the withdrawal of the cannula. The nurse should be warned to keep a watch for this sign. Considerable redness may call for the changing of the cannula to another vein.

CASE REPORT

A girl, aged 9, was admitted to Oldchurch Hospital, Romford, with acute mastoiditis. She had been ill for three weeks, and at the time of admission exhibited signs of meningism.

First Operation.—(J. M. C.) Simple left mastoidectomy performed. The mastoid cells contained pus. One tract led above the lateral sinus, which was exposed. There was then no sign of lateral sinus thrombosis. The following day the child still complained of headache, and her temperature remained in the region of 103° F. During the subsequent five days the patient's condition gave rise to increasing anxiety. The temperature became hectic, reaching 105°, and there were repeated rigors. She became semi-conscious, hollow-eyed, and obviously had not long to live.

Second Operation.—(H. B.) The left internal jugular vein was ligated, and the mastoid wound was then reopened. The needle of an aspirating syringe introduced into the lateral sinus failed to withdraw blood. The lateral sinus was opened and a quantity of soft clot removed. The ends of the sinus were then plugged with gauze soaked with flavine.

Continuous intravenous saline in glucose was commenced, the site of the injection being the internal saphenous vein (see Fig. 3).

Subsequent Progress.—Isotonic saline and glucose venoclysis was maintained at the rate of twenty-five drops per minute for six days. To each pint was added 4 c.cm. of the aqueous solution of 1 per cent. mercurochrome. Improvement was manifest within forty-eight hours. On the sixth day it was noticed that the urine and the faeces were tinted pink. The latter phenomenon is particularly instructive, for it is proof indeed that the bowel has an excretory as well as an absorptive function. By the end of the third week after the second operation the child was convalescent, and the mastoid wound had practically healed.

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CYSTICERCOSIS IN TWIN BROTHERS AGED 13 YEARS

WITH A RADIOLOGICAL STUDY OF THE CALCIFIED
CYSTICERCUS IN TWELVE CASES

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The case recorded below illustrates well the importance of remembering the relation of cysticercosis to epilepsy in the clinical examination of any patient suffering from this symptom.

On September 11th, 1933, a schoolboy was sent to the x-ray department, Millbank Hospital, for a routine examination of the skull, with the following short clinical notes: "History of fits since infancy, also history of injury to skull over right frontal bone. He has slight adiposity. ? Any bony abnormality pituitary fossa." Examination of the radiographs showed a normal skull with nine small circular opacities similar to those caused by calcified cysticerci. The boy was sent for, and came from school to be radiographed again. Examination of radiographs of the limbs revealed the presence of twenty-three calcified cysticerci of various shapes, the longest measuring 23 mm. Further investigation of the history elicited the facts that the family went to India in January, 1926, and returned to this country in June, 1928. The boy has had six fits, the first at 18 months, the second at 3½ years, the third at 11 years, in August, 1931, one in May, 1932, and two recently in 1933. The fits are of a mild type with "stiffening of the muscles" of the left side, followed by unconsciousness. The tongue has not been bitten. Some of the fits have been accompanied by incontinence of faeces and urine. Excitement appears to determine the onset of a fit, but the boy is apparently able to "pull himself together" and ward off the attack. He has never had a tapeworm. No nodules have been observed, and none is palpable at present. In 1929 he was in hospital with rheumatic fever, which left no complications. His twin brother had a "tapeworm" on board ship on the journey home, which was treated and "cured" in 1929 (species is unknown). The twin has never had any fits nor have any nodules been noticed, and none is palpable at present. Radiographic examination of this twin showed a calcification over the root of the neck on the right side, which in appearance exactly resembles a calcified cysticercus (Shape No. 7, see figure). Placental infestation has been suggested in the literature, and is a possibility in view of the normal motility of the oncosphere. The mother was radiographed with negative results.

COMMENTARY

It was a curious coincidence to come upon such a case during the investigation of epilepsy in soldiers. The radiopacities in the skull are so small that they might easily

have been overlooked if the attention of the radiologist had not been focused for some time on this disease. In the absence of the skull radiopacities, the age of the patient might have led one to omit the x-ray examination of the limbs. It would seem that the investigation for the cause of epilepsy or allied mental and psychical conditions cannot be regarded as complete until a thorough search has been made in the soft tissues for the presence of the calcified cysticercus. It is imperative for the radiologist to be acquainted with the possible appearances of the calcified or early calcifying cysticercus. The figure [reduced to 2/5 linear] shows the various shapes seen in the radiographs of twelve cases in this hospital. Their actual size can be calculated from the millimetre scale reproduced at the right-hand lower corner.

CALCIFICATION OF THE CYSTICERCUS

Calcification of the cysticercus in the brain is rare in our series of cases, and was found in only one other out of twelve. At present radiology can play a part in the diagnosis only when calcium is deposited in the dead parasite—that is, relatively late in the disease. It is to be noted that the presence of calcified cysticerci by no means excludes the presence of living parasites in the same patient. The amount of calcium deposit and the time taken for this depend on various factors not yet fully understood. The radiopacities in the tissues in a case of cysticercosis represent: the calcifying or calcified scolex, the true bladder in which it developed, the remains of the fluid contents of the true bladder, the outer cyst wall provided by the tissues of the host, and the remains of the fluid contents of this outer cyst. The shape depends on the pressure by neighbouring structures.

The scolex, as the solid portion of the bladder-worm, may be expected to receive the heaviest deposit, and this fact is well illustrated in Shape 4 ("oval with spot"), which in the radiograph exactly resembles the excised cysticercus with its glistening "milk-spot" on the bladder wall. Caseation before calcification will explain the appearance of the lines indicated in the various diagrams. Many of the calcified cysticerci show a very definite halo, which is accepted as indicating calcification in the outer cyst wall or in its outside layers.

The skull radiograph is often asked for in a case of epilepsy, but if there is the least reason to suspect cysticercosis it would be much better to devote the radiographic examination to the soft tissues. The routine in such a case at present is: lateral view of the skull, root of neck, upper arms, forearms, thighs, and legs.

DIAGNOSIS

The figure showing the various shapes indicates what the radiologist has to search for in the tissues. The names

are given for easy reference in the viewing of radiographs. There may be countless numbers present, making diagnosis simple, or the search may have to be a minute one for the identification of a single cysticercus in a very early stage of calcification. When this is found, and corresponds to any of the very definite shapes indicated, the diagnosis can be made. Solitary doubtful calcifications can be localized, excised, and, after solution of the calcium salts with weak hydrochloric acid, a search can be made for the

hooklets of the scolex. Radiological examination at six-monthly intervals may be indicated in certain cases.

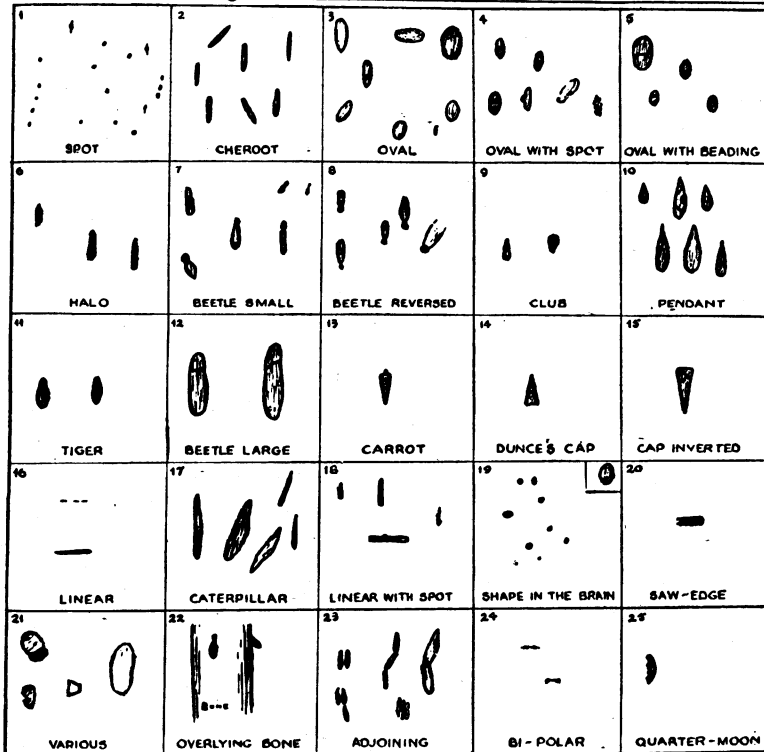
The advantages of diagnosing the presence of the condition are:

1. For the diagnosis of the actual complaint.
2. For assessing the responsibility of service or employment for the presence of the disease—for example, epilepsy.
3. For assistance in the diagnosis of generalized or localized brain lesions.
4. To prevent operative treatment where the end-result is unlikely to be successful—for example, very heavy infestation.
5. To remove the hereditary stigma of "epilepsy."

I wish to acknowledge the help of Colonel W. P. MacArthur, who is responsible for this investigation, the co-

operation of Major H. B. F. Dixon, and the assistance of Captain F. P. M. Anderson in obtaining the clinical notes of the particular case described.

VARIOUS SHAPES of the CALCIFYING or CALCIFIED CYSTICERCUS



ACTUAL SIZES—COMPARE SCALE SIZES VARY—WIDTH 1-7 mm. LENGTH 1-23 mm. FROM RADIOGRAPHS OF 12 CASES OF CYSTICERCOSIS. Q. A. MILITARY HOSPITAL, LONDON

ARTIFICIAL PNEUMOTHORAX IN THREE CASES OF PULMONARY TUBERCULOSIS IN CHILDREN

BY

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Pulmonary tuberculosis of the adult type with a positive sputum in children is generally recognized to be uncommon; indeed, before the age of 10 it has been classed as "a medical curiosity."¹ While in the strictest sense this is hardly correct, the disease is unquestionably rare in the first decade of life. The outlook for these patients is grave. One authority² on diseases of children says he has "never seen a case recover in which a definite diagnosis of pulmonary tuberculosis could be made." This experience is particularly unfortunate and not universal. A certain number of the afflicted children do recover, and remain well.

In an endeavour favourably to influence the prognosis, collapse therapy was instituted in the following three patients, who were sent to the Osler Pavilion, Radcliffe Infirmary, by Dr. G. C. Williams, medical officer of health for the city of Oxford, to whom I am indebted for their early history.