PAINLESS INCISION BY THE USE OF PURE PHENOL

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Incision of tissues, even deep ones, can be made painlessly by dipping the scalpel in pure phenol (carbolic acid). Incisions made in this manner will not be followed by even the smarting sensation which follows incisions made by other methods.

TECHNIC

A dry, sterile scalpel is dipped in pure phenol. The point of the back of the scalpel is passed over the intended line of incision, so as to mark it with the phenol. A few seconds later the scalpel is dipped again in the phenol and the tissues are incised very slowly and gently, the scalpel being moved up and down as in cutting with a saw. When blood appears, a sponge is used or blunt retractors are applied, if necessary, the scalpel being dipped in pure phenol as often as required. By this method a film of the phenol is deposited on the blade; this film comes in contact with the tissues as they are cut, and thus anesthetizing them. This film is rubbed off by the tissues or washed off by the blood through which the blade passes, and therefore has to be renewed by dipping the scalpel in the acid as often as is necessary, according to the depth of the tissues to be incised.

ADVANTAGES OF THE METHOD

Absolutely painless incisions are obtained of even very deep tissues, such as the pleura, culdesac of Douglas (four cases), etc. Over 100 pleurotomies have been done by this method, during the last epidemic of influenza, by Professor Buschi of Como, Italy, and the writer. It is the least dangerous method of anesthesia, either local or general. The method has been applied in over 3,000 cases and there has never been the slightest indication of absorption or even slight poisoning from its use. It is the easiest method to apply and the one method which can be applied in all cases and which will always work, even when the tissues are most inflamed and in cases in which either local anesthesia is not possible or general anesthesia is contraindicated. Some of the pleurotomies have been done in patients who were in a moribund state and the results have been most gratifying. It is the most convenient method and the one least feared by the patients, for phenol is found anywhere, and no special preparation, not even painting the skin with iodine, or any instrument or apparatus, not even a syringe, is required for its application. Naturally it is the cheapest method imaginable. In a given class of cases it promotes the complete cure of the pathologic condition.

This statement is most important and requires special mention and some explanation. Incision made with the phenolated scalpel, on account of the slight cauterization of incised tissues produced by the phenol, do not close as rapidly, as incisions made with the untreated scalpel. This was at first thought to be a very serious inconvenience; in practice, however, it has proved to be one of the best points of this method. In fact, any tissue that is incised, the cut edges of which need not adhere immediately, as is the case when a collection of pus has formed or the tissues are highly infected and inflamed, as in cellulitis, or in the presence of a foreign body embedded in the tissues, the too early closing of the cut edges is prevented and the exit of the pus is facilitated by the insertion of gauze, rubber, tubes, etc., which in certain parts of the body can be placed only with difficulty or cannot be kept in the desired place and always act as foreign bodies with all their undesirable results. When the incision is made with the phenolated scalpel all these means become absolutely unnecessary and the complete cure is rendered more easy, painless and more rapid, while the cosmetic results are also much better. This method of incision finds its best indications in cellulitis of the limbs, collection of pus in Bartholin's glands, in the posterior culdesac of Douglas, in or around the gums, the anus, the neck, the face, the axillae, the groins, etc., in which cases the simple incision made with the phenolated scalpel and the wet dressings or

frequent washings with warm liquid constitute the whole treatment, which is both complete and rapid.

The phenolated scalpel, for obvious reasons, should not be used when reunion by first intention and suture are desired. The scars produced by the phenolated scalpel are never ugly; in fact, they are much better than those resulting in cases in which drainage was necessary. A slight redness along the incision lasts at times for some days, but disappears completely in a short time.

REPORT OF CASE OF SEPTIC SINUS THROMBOSIS
WITHOUT INVOLVEMENT OF THE MASTOID

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History.—Private S. B., aged 23, was admitted to the hospital, Jan. 14, 1919, with influenza. January 18 he developed measles; January 30 otitis media purulenta acuta of the right ear; January 31 otitis media purulenta acuta of the left ear. Myringotomy was done in each case the day of the development of the acute ear trouble, and irrigations of boric acid solution every two hours were ordered.

The course of the patient's illness was such as would be expected with this complication of diseases and the temperature ranging irregularly from 98 to 104.

February 14, the patient was transferred to the ear ward, as the influenza and measles had subsided and there was no clinical evidence of any disease aside from the discharge from the ears.

February 18, both ears were dry, and on examination the drums presented the appearance of resolution.

February 20, the patient complained of discomfort over the left side of the face, and kept the head covered the entire day. There was no headache. The blood count was: 15,000 leukocytes; 79 per cent. polymorphonuclears.

February 23, the patient had a definite chill lasting about twenty minutes, followed by a rise of temperature to 105.2 (by mouth), accompanied by severe frontal headache, and followed by a profuse sweat. The blood count was: 23,300 leukocytes; 93 per cent. polymorphonuclears. The blood culture was positive for *Streptococcus hemolyticus*.

Physical Examination.—The heart and lungs were normal. The liver and spleen were normal. There was slight inequality of the pupils. The reaction to light was normal. Kneejerks were slightly exaggerated but were the same on both sides (this had been the case for over three weeks). There was partial ankle clonus on the left side, and complete on the right side. Examination of the urine disclosed some pus cells and a slight trace of blood. Widal test was negative. The blood was negative for malaria. The fundus examination was negative.

February 24, the patient complained of headache, general in character and not confined to any special point or region. At noon he had a severe chill lasting thirty minutes, followed by a temperature of 104.6. Examination of the ears at this time showed the right drum to be normal in appearance with good inclination and light reflex normal. The left drum showed much the same appearance except for absence of the light reflex and a slight dullness. This was the second ear to become involved, and this difference in appearance might perhaps be accounted for in this way. Both drums presented the appearance of a resolving acute otitis media. There was absolutely no mastoid tenderness at this time or at any time during the course of the illness. The blood count was: 38,000 leukocytes; 94 per cent. polymorphonuclears. The blood culture was negative. The physical examination and the urinary examinations were also negative. The fundi were negative. No lumbar puncture was done.

Operation was decided on, but in view of the urinary findings it was suggested that there might be some kidney condition to account for the septic course the patient was running. A cystoscopic examination was made by the urologist, and the findings were negative.

February 25, the blood count was: 31,200 leukocytes; 94 per cent. polymorphonuclears. The blood culture was negative.

Operation.—A simple mastoidectomy under ether was performed with the following findings: The cortex was thick

and very sclerotic. The mastoid cells were normal, and there was no pus even in the antrum. The sinus was exposed, but as there did not appear to be any definite disease of the sinus, it was decided to uncover and inspect the dura over the temporosphenoidal lobe and cerebellum. This was accomplished after considerable difficulty on account of the ivory-like hardness of the bone and the high middle fossa. Much time was consumed in this way unnecessarily. After exposure of the dura and finding it normal, a further examination of the sinus was made, and, as it appeared paler than normal, it was opened and thick pus exuded and continued to exude as from an abscess. The jugular vein was then resected, after which the sinus was again attacked from the mastoid wound. The diseased walls were cut away, and only the dural wall was allowed to remain. A culture from the sinus showed a pure growth of *Streptococcus hemolyticus*. The vein was normal. The patient made an uneventful recovery.

COMMENT

This case was unusual in that the infection must have spread from the middle ear without involving the mastoid and in that there was a negative appearance of the drum with absolute cessation of the discharge and negative findings in the mastoid. It has been my experience to find great destruction of the mastoid cells when *Streptococcus hemolyticus* is the causative factor, with pain and tenderness over the mastoid negative.

A TEST FOR GLOBULIN IN SPINAL FLUID FOR USE AT THE BEDSIDE*

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Rough tests on globulin solutions showed the isoelectric point to be between p_H 4.4 and 4.7. The p_H value for a 2 per cent. solution of anhydrous potassium dihydrogen phosphate is 4.4. If the globulin precipitation depends on the p_H value of the solution, then a solution of primary phosphate could be substituted for the Noguchi butyric acid sodium butyrate mixture. Various concentrations of the primary phosphate were used, from 2 per cent. to 10 per cent., in testing spinal fluids known to contain excess of globulin, as shown by the Noguchi method. To 0.2 c.c. of the spinal fluid were added 0.6 c.c. of the primary phosphate solution, and the tube containing the mixture was immersed in boiling water for six minutes. The solution acting the most quickly and yielding the largest flocculation was the 3 per cent.; this compares favorably with the Noguchi test.

CHANGE IN p_H VALUE IN BOILING

The p_H values of the mixtures of spinal fluid plus phosphate solution and the mixtures of spinal fluid plus Noguchi's mixture are equal. However, on boiling, the phosphate spinal fluid mixture becomes less acid, as shown by methyl red, while the Noguchi mixture remains unchanged. If the phosphate solution is fortified by the addition of acetic acid so that the p_H value after boiling with the spinal fluid remains about 4.4, the globulin is either not precipitated or the floccules are very minute. Apparently other factors than hydrogen ion concentration enter into the reaction. A 10 per cent. phosphate solution possesses sufficient buffer power to maintain the p_H value during boiling, but the high salt content produces very fine granulation of the globulin. Addition of various amounts of sodium chlorid yields like results. It appears that the globulin precipitation depends not only on the hydrogen ion concentration but also on the amount of salts present.

Spinal fluids tend to become more alkaline even when placed in the ice box over night. For testing such fluids it has been found advisable to add to each 100 c.c. of potassium dihydrogen phosphate solution in 0.05 c.c. of glacial acetic acid.

COMPARISON OF THE PHOSPHATE SOLUTION REAGENT WITH THE NOGUCHI TEST

Through the kindness of Dr. Martha Wollstein of the Rockefeller Institute and Miss Innerstein of the New York City

Board of Health Laboratory, twenty-one specimens of spinal fluids were tested with the Noguchi and the 3 per cent. primary phosphate solution plus 0.05 c.c. of acetic acid. Two-tenths c.c. of the spinal fluid was used in each test. In the Noguchi test 0.5 c.c. of 10 per cent. butyric acid in isotonic sodium chlorid solution was added and the mixture heated for two minutes. One-tenth c.c. of normal potassium hydroxid was then added and the tube containing the mixture placed in boiling water for four minutes. The phosphate-acetic acid mixture test was conducted as follows: To 0.2 c.c. of the spinal fluid there was added 0.6 c.c. of the reagent. The tube containing the mixture was placed in boiling water for six minutes. The results of the test are shown in the accompanying table.

The reagent, being less delicate than that of the Noguchi test, gives no precipitate with normal fluids, but consistently indicates fluids in which globulin is present in excess. The reaction requires about two minutes longer heating than is required with the Noguchi test, but requires less manipulation, since one solution is used instead of two. Accurate pipetting

COMPARISON OF RESULTS OF GLOBULIN TESTS ON SPINAL FLUIDS WITH THE NOGUCHI REAGENTS AND WITH 3 PER CENT. POTASSIUM DIHYDROGEN PHOSPHATE ACETIC ACID

Spinal Fluid from Case of:	Butyric Acid Test of Noguchi	3 Per Cent. KH_2PO_4 in 0.05 C.C. of Glacial Acetic Acid
1. Encephalitis lethargica (?)	+	+
2. Encephalitis lethargica	+	+
3. Tuberculous meningitis	++++	++++
4. Normal fluid	+	+
5. Cerebrospinal meningitis	++++	++++
6. Tuberculous meningitis	++++	++++
7. Cerebrospinal meningitis	++++	++++
8. Cerebrospinal meningitis	++++	++++
9. Normal fluid	+	+
10. Tuberculous meningitis	++++	++++
11. Normal fluid	+	+
12. Encephalitis lethargica (?)	+	+
13. Normal fluid	+	—slight turbidity
14. Cerebrospinal meningitis	++++	++++
15. Encephalitis lethargica (?)	+	+
16. Cerebrospinal meningitis	++++	++++
17. Encephalitis lethargica (?)	+	+
18. Encephalitis lethargica	+	+
19. Encephalitis lethargica	+	+
20. Encephalitis lethargica	+	+
21. Encephalitis lethargica	+	+

* Floccules smaller than in Noguchi test.

of the spinal fluid only is necessary; slight variations in the amount of the reagent added do not affect the end-result. The objectionable odor of the butyric acid is absent; consequently the test can be made in the patient's room. Should small amounts of the solution be spilt in transportation, the diagnostician's kit is not thereby rendered disagreeably redolent. The solution is quickly and easily prepared and is stable, while the Noguchi reagents require accurate titration and tend to become cloudy on standing.

SUMMARY

A suitable reagent for the globulin test in spinal fluid may be prepared by dissolving 3 gm. of anhydrous potassium dihydrogen phosphate in 100 c.c. of distilled water and adding 0.05 c.c. of glacial acetic acid. In making the test, 0.2 c.c. of the spinal fluid plus 0.6 c.c. of the reagent are mixed in a small agglutination tube and placed in boiling water for six minutes. This test is slightly less delicate than the Noguchi test, but offers some advantages over the latter for field work.

Pathology of Schoolchildren.—In the school year 1917-1918, 21,263 children were examined, and of this number only 6,243 were reported to be normal, and 15,020 to be subnormal, or approximately 75 per cent. of the total number; 4 per cent. were found to be suffering from malnutrition, 5 per cent. from enlarged cervical glands, 15 per cent. with defective vision, 3.5 per cent. defective nasal breathing, 5.5 per cent. with defective teeth, 8.5 per cent. with enlarged tonsils, 1.25 per cent. with impediment of speech. These conditions exist in every community.—*Public Health News*, New Jersey.

* From the Laboratories of the Rockefeller Institute for Medical Research.