INTENSIVE TREATMENT OF ACUTE TETANUS

BY

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The intensive treatment described below was followed by the very gratifying and somewhat surprising recovery of a patient who was suffering from acute tetanus. It therefore appears to be worthy of record.

CASE RECORD

A mason's assistant, aged 18, was admitted to the Surgical Unit late at night on January 24th, complaining of pain and stiffness of the jaw. Nine days previously he slipped upon a plank, and a rusty nail pierced his boot and entered the sole of his foot. The nail was removed by a doctor and the wound healed rapidly. On admission there was marked trismus and slight rigidity of the neck. The temperature was subnormal. His general condition was good, although he appeared somewhat pale and was perspiring freely; there was no risus sardonicus. A small healed scar was seen under the ball of the big toe. He was given 40,000 units of antitetanic serum intramuscularly that night. By the following morning he was desperately ill—temperature 104° F., very pale, with risus sardonicus well marked, complete opisthotonos, and the abdomen as rigid as a board.

Vigorous antitetanic treatment was immediately inaugurated. Phenol 2 per cent. was injected deeply into and around the scar on the sole of the foot. Antitetanic serum 20,000 units, with 2 c.cm. 25 per cent. sterile magnesium sulphate, were introduced intrathecally after the appropriate amount of cerebro-spinal fluid had been withdrawn, and 20,000 units was given both intravenously and intramuscularly. As the muscular contractions persisted this dosage of antitetanic serum was repeated daily for the first four days. Hypodermic injections of 1 c.cm. of 1 per cent. phenol were given three times daily for the first week. Three days after admission he developed pulmonary oedema, and became cyanosed. It appeared that death would not be long delayed. He was treated with hypodermic injections of 1/100 grain of atropine three times daily, and daily injections of 10 c.cm. of antipneumococcal serum for the next six days, when the pulmonary oedema cleared up. During this time the antitetanic serum was administered daily. The muscular rigidity persisted. A consultation was held, and, in spite of the absence of tenderness and local spasm on the sole of the foot, it was decided to open up widely the area of the healed scar. Amputation of the foot was considered, as the patient's condition was desperate, but the less drastic interference was decided upon first.

After the administration of intrathecal antitetanic serum and magnesium sulphate, 0.05 gram of stovaine was introduced into the spinal theca, and, during the anaesthesia which followed, the small scar was cut into by an extensive crucial incision and the flaps turned out. A swab from the depths of the scar failed to grow *B. tetani* on an anaerobic culture. The wound was curetted, packed with eusol gauze, and dressed thrice daily. Catheterization was necessary for a few days in the second week. The use of volatile anaesthetics for paroxysmal exacerbations (which, fortunately, were few) was contraindicated on account of the pulmonary oedema. Chloral hydrate, potassium bromide, and morphine were given to this end, to promote sleep when necessary, and for the relief of pain, which was sometimes agonizing.

The temperature varied from 100° to 106° F., until the end of the sixth week, when it became normal and remained so.

The intrathecal administration of antitetanic serum, and its augmentation by the intravenous and intramuscular routes, was continued on alternative days until the end of the fourth week on account of the persistence of spasms and general rigidity. At the end of this time the patient was terribly emaciated, but the disease had been eradicated, and his convalescence was slow but uneventful.

COMMENT

The recovery, no doubt in large part due to careful, painstaking, and intelligent nursing, appeared to follow the use of very large doses of antitetanic serum administered subcutaneously, intrathecally, and intravenously. Further, local excision of the wound was undertaken, and eusol (highly oxygenating) dressings were kept applied. Magnesium sulphate was administered intrathecally and phenol subcutaneously. Antipneumococcal serum also appeared to help when a bronchopneumonia threatened. The case serves as a plea for the administration of antitetanic serum in heroic doses—especially by the intrathecal route—even when the condition appears hopeless. It also illustrates the fact that "diminution or stoppage of the serum has brought on fresh spasms or increased the rigidity, which have promptly subsided on the administration of more serum." Altogether, approximately 1,800,000 units of antitetanic serum were used in this case, at a cost of nearly £90.

I am indebted to Professor A. W. Sheen (director of the Surgical Unit) for his kind permission to publish this case.

REFERENCE

¹ Yodh: *British Medical Journal*, 1932, ii, 589.

INTERNAL FAECAL FISTULA AND DEATH FOLLOWING APPENDICECTOMY

BY

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The study of modern textbooks and literature is somewhat confusing as regards the handling of the patient whose appendix has been removed, and who, within three or four days of the operation, begins to show those ominous signs known to all surgeons as likely to mean death in the near future. Further, in the actual presence of such a case, the opinions of surgeons as to the exact diagnosis and treatment is often divided, whereas all dread the worst prognosis.

It has been my lot to be called into consultation in two such cases lately, and I have also been allowed to perform a necropsy in each case.

Case 1.—H. C., aged 21, a well-built man, was admitted having had a previous attack of acute appendicitis. This had been successfully weathered, but he was about to begin another attack. The appendix was removed through a McBurney's incision. It was retrocaecal and subacutely inflamed. There was no fluid in the abdomen. Catgut was used for the stump, and a purse-string suture made. As on the third day after operation the patient had slight fever an enema was given with satisfactory results, and a purge was then ordered. On the following day the patient was in a collapsed condition, and, soon after, localized peritonitis in the neighbourhood of the wound was diagnosed. In the afternoon an abscess, with very fluid foul pus, was found in the pelvis and drained. Notwithstanding this the patient grew worse and died on the eighth day. Post mortem the intestines were removed with great care and, under gentle pressure from a tap, water was allowed to flow into the bowel. In due course the water spurted through the hole at the site of removal of the appendix in the caecum. In this case it seemed probable that the enema had burst the sutures inserted at the site of the amputation of the appendix. The internal fistula in the caecum, lying up against the ilio-psoas muscle, did not allow of the passage of faeces—especially as the bowel had been previously emptied—but did permit the passage of the most virulent of all the bowel fluids into the iliac fossa and the pelvis. The greenish track, leading from the internal fistula towards the pelvic abscess, provided ample evidence of this.

Case 2.—Admitted sixty hours after starting the attack, this patient was kept under observation according to Ochsner-

Scherren's delayed method of treatment. Within eight hours the pulse had risen twelve points, and accordingly the patient was operated upon and a gangrenous appendix removed. All went well until the fourth or fifth day, when symptoms of paralytic ileus and, later, obstruction, developed. A large pelvic abscess was emptied per rectum, but all to no purpose. Post mortem a condition similar to that of the first case was found, except that the edge of the internal fistula was much indurated, and there was a plastic peritonitis, with small abscesses here and there among the coils of the bowels. The greenish appearance of the bowel, and of the tissues in the neighbourhood of the internal fistula, was again apparent. Here again the following sequence of events seemed probable. A few days after the operation the caecum had opened at the site of the operation, and all the well-known clinical complications had developed—namely, paralytic ileus, obstruction, peritonitis, and death.

DISCUSSION

An examination of three modern textbooks is of interest at this point.

Hamilton Bailey, in *Emergency Surgery*, states that "a faecal fistula is generally to be regarded as a most unfortunate and disagreeable complication. There are occasions, however, though few and far between, when its manifestation is not so displeasing. 'If a patient with peritonitis develops a faecal fistula he does not die' is a 'bon mot' of a former colleague of mine. There is an element of truth in this aphorism when applied in cases of advanced peritonitis with meteorism, since the faecal fistula acts as an enterostomy."

Carson, in *Modern Operative Surgery*, referring to paralytic ileus and caecostomy, says: "There is no doubt that opening the caecum in these cases has a very beneficial action. In the simplest form it is seen when, following the spontaneous formation of a faecal fistula after an operation for gangrenous appendicitis, the case shows a rapid improvement. The mechanism of this action is not very clear, for it is certain that the poisonous accumulation is in the small intestine, not in the large, and often when the caecum is opened nothing escapes but gas. Perhaps the relief of tension in the caecum effects in some way the patency of the ileocaecal sphincter." But after mentioning various methods of treatment of this condition he considers it difficult to determine their comparative value, and states that it is of the greatest importance to differentiate paralytic ileus and general peritonitis. He favours caecostomy, but does not mention that an inspection of the site of the removal of the appendix should be made.

In their *Science and Practice of Surgery* Romanis and Mitchiner do not mention an internal faecal fistula as one of the causes of paralytic ileus and its consequences (p. 669, vol. ii), nor is this condition mentioned among post-operative complications (p. 691, vol. ii).

The explanation of the condition in these cases seems fairly clear. In the instances referred to, an internal fistula had formed, and was followed by death, but if the bowel secretions, faeces, etc., should have found their way out on to the surface of the body the patients' lives might have been saved, whereas the reverse process led to their death. That an early jejunostomy or ileostomy sometimes saves the patient's life is well known, and it is to be imagined that, if a blind ileostomy is performed soon enough, should an internal fistula be present, it prevents some of the secretions from the stomach, liver, pancreas, and intestine reaching the hole in the caecum, and thus soiling the peritoneum. But an ileocolostomy is a relative failure in these cases, for while making a short circuit, it returns the secretions to the colon, whence they can easily gain the caecum and be poured into the pelvic cavity.

Nowhere in the modern literature on this subject have I found it stated that the first step in the operative treatment of these difficult cases should be a thorough examination of the site of the removal of the appendix, and that if an internal faecal fistula of the caecum be found that it should be converted into an external one, and this, I suggest, is a procedure to be advocated in these cases at the earliest possible indication of trouble.

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

MINERAL MATTER IN LUNGS

The importance of examining the mineral matter in lungs by transmitted light, dark-ground illumination, and polarized light is the apologia for publishing a method of preparation which has the merits, I think, of simplicity and completeness.

Thirty or forty grams of lung are cut into small pieces five or six millimetres square. If the lung has been fixed in formalin larger portions—one inch square, or larger—are washed in several changes of tap-water and then cut into smaller pieces. These are placed in a flask with 150 c.cm. of 20 per cent. liquor trypsin (Allen and Hanburys) in a 1 per cent. solution of potassium carbonate, and incubated at 37° C. In two or three days some of the turbid fluid is centrifuged, the deposit rendered slightly acid with a few drops of dilute sulphuric acid, washed in distilled water, and examined. If permanent specimens are required, films are made, dried over a Bunsen, and mounted in green euparal. The remaining fluid and lung in the flask are boiled for twenty minutes, cooled, 20 c.cm. of liquor trypsin added, and reincubated for twenty-four hours. The fluid is acidified, centrifuged, and the deposit washed as before, and examined. The deposit will contain the carbonaceous matter in addition to any other mineral present. Finally, the deposits in several centrifuge tubes are mixed together in a pyrex tube, 10 c.cm. of strong sulphuric acid and a crystal of potassium bichromate added and boiled until clear. The tube is centrifuged, the deposit washed with distilled water, recentrifuged, and mounted.

The deposit from the first incubation will contain some carbonaceous and other mineral particles, and in the various pneumoconioses, particles associated with the respective diseases—asbestos bodies, and fragments of asbestos fibre in asbestosis, coal particles, and silico-anthraccotic bodies in anthracosis, etc. The deposit from the second incubation will contain the carbonaceous and "coaly" matter from the hard fibrous portions of the lung in addition to the above. The final deposit—that is, the deposit after treatment with sulphuric acid—will contain the silica, insoluble silicates, diatoms, etc., free from organic and "coaly" matter.

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A CASE OF PROSTATIC ABSCESS

The following case is worthy of interest in that a common cause of perianal suppuration of prostatic and vesicular origin is frequently overlooked and seldom recognized.

A male patient, aged 52, single, complained of dysuria and frequency of micturition for the previous four weeks. It was soon apparent that this was due to a posterior urethritis, not responding to the ordinary line of treatment. On admission to hospital his temperature was 98° F., pulse 65, respiration 20. The urine contained albumin, pus, and some threads. Rectal examination revealed an enlarged prostate with a soft boggy area high up on its right aspect. An operation was performed five days later, when the prostate was exposed by the perineal method. There was much perirectal thickening, and an abscess cavity, containing about three drachms of thick caseous pus, was found high up on the right side of the prostate, involving the right seminal vesicle. A rubber drainage tube was inserted and the patient returned to the ward. On examination the pus was sterile, but the microscopy of some granulosomatous scrapings showed no giant cells. Urine analysis revealed no evidence of tubercle bacilli. The abscess cavity drained freely, and the patient made a good recovery, being discharged healed in three weeks. It is evident that without adequate drainage the abscess would have tracked downwards and caused one of the common types of perirectal infection.

I am indebted to Mr. Winsbury-White for permission to publish this case.

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