

fatal case of class 2 being practically hopeless on admission. In short, the cases taken as a whole in Major Stevens' two series are about as far from being comparable in severity as could well be imagined. In fact the aspiration series were almost twice as serious as the open operation one, as shown by the fact that the estimated mortality by the open operation according to the former rates worked out at 4.19 in the 13 open operation series which can be classified and 8.01 in the 14 aspiration series as shown in Table II.

With the aid of these figures we are now in a position to make a fairly accurate estimate of the results of the two methods of treatment. Thus, in the open operation series there were actually 4 deaths in the 13 cases it is possible to classify, against an estimated mortality at the old rates in such a series of 4.19. The excellent results

A Mirror of Hospital Practice.

A SERIES OF CASES OF CHOLERA TREATED BY MAJOR LEONARD ROGERS' METHOD OF INFUSION OF HYPERTONIC SALINE SOLUTION TOGETHER WITH REMARKS THEREON.

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ON my appointment to this District last year I found that an epidemic of cholera was a fairly regular annual occurrence in the rains and therefore bought the apparatus consisting of graduated glass bulb, tubing, cannulæ, etc., as in-

TABLE II.

Analysis of Major Stevens' liver abscess series.

Site of puncture.	OPEN OPERATION.				ASPIRATION AND QUININE.			
	Cases.	Cured.	Died.	Estimated mortality.	Cases.	Cured.	Died.	Estimated mortality.
1. Through chest wall ...	2	...	2	1.46	9	7	2	6.57
2. Below right ribs ...	3	2	1	1.77	2	1	1	1.18
3. Epigastrium ...	8	7	1	.96	3	336
Total ...	13	9	4	4.19	14	11	3	8.01
Doubtful cases ...	4	3	1	?				

obtained in the open series are thus evidently essentially due to the very favourable nature of the majority of the cases treated by incision and drainage. On the other hand, in the cases in which my plan has been adopted the actual death-rate was 3, against an estimated one by the open operation in a similar series, according to the previous results of a large number of cases treated in the same hospital, of 8.01. This gives nearly a three-fold reduction of the mortality by my plan in Major Stevens' series of cases, which is the largest and most important in which aspiration and quinine injection without drainage has yet been adopted by any one surgeon.

Major Stevens has been altogether too modest in his brief note, and he is to be congratulated on the number of lives he has saved by the use of my method in the very serious cases in which he has adopted it. His results together with those recorded in the earlier part of this paper, should go far to ensure the benefits of the simple method of aspiration and quinine injection being substituted for the much more painful and exhausting open operation for sterile amœbic abscesses of the liver in all cases in which it is possible to carry it out, which will include a vast majority of patients suffering from this dangerous and distressing disease.

vented by Major Rogers, for the Main Dispensary, Bilaspur.

On my return from England early in July 1910, I found the epidemic in "full swing" in the head-quarters town and started the treatment. With the exception of two or three cases, however, all the operations were performed by Assistant Surgeon W. Venkat Ramana.

The following table shows the results. It should be stated that in one case, that of a child of 4 years, an intra-peritoneal injection was given. All the figures refer to cases of the disease which occurred within the limits of Bilaspur Municipality, and between the dates July 10th and September 24th, 1910, both inclusive.

Total number of cases of cholera reported to Civil Surgeon's Office ...	133	Total number of deaths from cholera reported to Civil Surgeon's Office 68	68
Number of cases treated by hypertonic infusions ...	39	Number of deaths occurring in cases treated by infusion ...	9
"Balance" i. e., number of cases not treated ...	94	"Balance" of deaths in untreated cases ...	59
		Case mortality in treated cases ...	23.07 per cent.
		Case mortality in untreated cases ...	62.76 per cent.

Of the 39 cases treated, five received a second injection, and in 33 out of the total 44 operations

Liquor Strychninæ hydrochlor (B. P.) was mixed with the infusion in doses not exceeding m. 8. Of the 39 cases, 31 were males and 16 females were under fifteen years of age.

The infusion consisted of a solution in boiled well water of four drachms to the pint of common salt with which an equal quantity of partially cooled boiled well water was mixed at the time of administration. For the last few cases, however, the stock saline solution was made with distilled water. The solution and water of admixture were strained through boiled gauze in a funnel to clear it of suspended matter. Four pints was the usual dose for an adult.

The temperature of the solution as is issued from the cannula was such as to make it feel comfortably warm to the operator's hand. The glass bulb was usually maintained at a height of about four feet above the patient.

In no case was any general anæsthetic or local analgesic given.

The immediate result of the operation was usually the return of the radial pulse and of warmth to the skin, a rise of temperature in the axilla from subnormal to 102° or 103, the cessation of "cramps" and in some cases the occurrence of a rigor.

The secretion of urine was, in successful cases, almost immediately re-established and was usually maintained throughout the after progress of the case.

Patients were encouraged to drink water freely throughout the disease, but all nourishment was withheld until vomiting and diarrhœa had entirely ceased.

When the case was seen in a very early stage from $\frac{1}{2}$ to 1 oz. castor oil was given otherwise no drugs by the mouth until convalescence was fully established, when a strychnine and iron tonic was prescribed.

Nearly all the cases treated belonged to the educated classes.

They were brought to the operating room of the Main Dispensary in the bullock tongas, the operation performed and immediately removed to their own homes. No case was operated on elsewhere than in the hospital operating room. Instruments were sterilized by boiling and dressings by dry heat or steam. Linen thread ligatures and sutures were used and a collodium dressing applied. In one case only did septic complications arise. This was in a convict in the jail who was in a debilitated condition when attacked by cholera. He received two infusions each of four pints.

Some ten days after the operation he developed a small abscess in the seventh intercostal space in the mid-axillary line between the external and internal intercostal muscles. This was opened and healed up. A few days later first one tympanic membrane and then the other perforated giving exit to pus. The only other symptom of the otitis media being deafness.

This condition subsided under local treatment hearing was regained and the man is now in his usual health and doing third class labour in jail.

Remarks.—The figures quoted are to my mind strong confirmatory evidence of the truth of Major Leonard Rogers' contention that *hypertonic* intravenous or, for certain cases, intra-peritoneal saline infusion is the rational and hopeful method of treating cholera. There is no doubt as to what the general public in this District think about it, and I hope that in future years the poorer classes as well as educated will avail themselves of it. As already stated this has not been the case in the epidemic just terminated. This brings me to the second part of my paper for it is not until the technique has been so simplified that Sub-Assistant Surgeons in charge of outlying dispensaries with their limited resources can practice the operation with safety that the method will attain its full utility.

Here I may mention that in 1908, Senior Grade Sub-Assistant Surgeon Mukerjee, of East Bengal and Assam, told me that he had practised the method on a large scale with home-made apparatus and with very successful results in a branch dispensary in Mymensingh District.

Owing to the lack of skilled assistance, etc., it is essential that the apparatus should be resistant to rough handling, should be cheap and easily capable of sterilization. I am arranging with Messrs. Down Bros., London, for the manufacture of a cheap apparatus in enamelled iron which will provide for the filtration of the infusion and for its delivery from the cannula at a constant and predetermined temperature. The whole apparatus will be contained in an outer vessel in which everything required for the operation can be transported and sterilized by boiling over a fire.

Finally I would remark that I believe the secret of success lies in the early performance of the operation, the sooner after the establishment of the diagnosis the better. Even when the pulse is fairly good the infusion must aid in washing out toxins through the kidneys. To wait until the blood pressure has fallen and the specific gravity of the blood has risen seems to me to be about as rational as to wait for the development of an abscess to operate on a case of appendicitis or until the larynx is nearly blocked with membrane before giving anti-toxin in diphtheria.

SUCTION OF ABSCESSSES.

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DURING the past two years I have employed the suction treatment of abscesses as a routine. I have nothing but praise for the method; it