

Coley toxins was begun on Sept. 23, 1908, and continued in slowly increasing doses till Oct. 9, when the patient was seen to be failing so rapidly that treatment was discontinued. Good reactions were obtained. He died on Oct. 16, 1908. No autopsy was permitted.

CASE XX. E. B. O., female, twenty-four, housewife. Entered M. G. H. (No. 160317) on Sept. 18, 1908, from O. P. D. (No. 114285) with a recurrent tumor of the right axilla. The primary tumor first appeared four years ago and was removed, as were two recurrences in the next three years. Present recurrence is of ten months' duration. On Sept. 19, 1908, the tumor was removed by Dr. Murphy, with thorough dissection of the axilla. Pathologic report: Round-cell sarcoma (W. F. W.).

Administration of Coley toxin was begun on Sept. 25, 1908, and continued in the Convalescent Home after the patient's discharge on Sept. 27, 1908.

In this series there were, then, 20 cases, which may be numerically analyzed as follows:

Of the 20 cases, 13 occurred in males, 7 in females. The average age of the males was 34½ years, of the females 32; total average age, 33½ years. The grouping by decades was

First decade,	2
Second decade,	2
Third decade,	5
Fourth decade,	7
Fifth decade,	0
Sixth decade,	3
Seventh decade,	1
	—
	20

The series presents a wide diversity in location and type of tumor. The right side of the body was involved eleven times, the left nine, — figures which tend to show the symmetrical distribution of sarcoma rather than its alleged predominance on the right.

In 7 cases the tumor was of the round-cell type, in 3 spindle-cell, in the remaining 10 of varying types or not stated. In 4 cases the thigh was involved, in 3 the upper jaw, in 2 the cervical nodes; the remainder were scattering.

From a study of these cases the following conclusions seem justifiable:

1. That the use of Coley toxins alone in the treatment of sarcoma is warrantable only in obviously inoperable cases and then as a last resort.

2. That the use of Coley toxins as an adjunct to surgery in the treatment of sarcoma, or as a prophylactic against recurrence, is advisable, though by no means of definitely established value.

3. That the preparation of the mixed toxins of *Bacillus prodigiosus* and *Streptococcus pyogenes* as a bacterial vaccine, by the method described in this paper, is quicker, simpler, and more accurate than their preparation by Coley's method, and that the product obtained is equally efficient.

SELECTED BIBLIOGRAPHY.

- Coley: Ann. Surg., 1891, vol. xiv, p. 199.
 Coley: Am. Jour. Med. Sci., 1893, vol. cxxxii, p. 487.
 Coley: *Ibid.*, 1906, vol. clviii, p. 375.
 Tracy: Jour. Med. Research, 1907, vol. xvi, no. 2, p. 307.
 Coley: New York Med. Rec., July 27, 1907, vol. lxxii, p. 129.
 Coley: Surg., Gynec. and Obstet., 1908, vol. vi, p. 129.
 Babcock and Pfahler: *Ibid.*, p. 160.
 Coley: BOSTON MED. AND SURG. JOUR., Jan. 30, 1908, vol. clviii p. 175.
 Beebe and Tracy: Jour. Am. Med. Assn., Nov. 2, 1907, vol. xlix, p. 1493.
 Coley: Surg., Gynec. and Obstet., 1908, vol. vi, p. 649.
 Coley: Proc. Roy. Soc. Med., November, 1909.
 Coley: Jour. Am. Med. Assn., Jan. 29, 1910, vol. liv, p. 333.

DOES APPENDECTOMY ALWAYS RELIEVE SYMPTOMS? *

AN ANALYSIS OF RESULTS YEARS AFTER OPERATION IN 640 CASES OF APPENDECTOMY.

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In order to determine whether appendectomy has cured the patient having symptoms referable to the appendix, we have made an investigation into the condition of a large series of cases years following operation. The cases forming this series were operated upon at the Massachusetts General Hospital Clinic. The surgical staff of the Massachusetts General Hospital operated upon these cases. The conditions under which operations were done and the methods employed were fairly uniform. The returns have been received from 640 cases. These end results represent the end results from a large series of operated cases, more than 3,000 appendectomies. The facts concerning these cases which have been very carefully analyzed, are as follows:

There were 640 cases of appendectomy in this series; 178, or 28.8%, of these were female; 462, or 72.2%, were male.

The ages at which appendicitis occurred in the 640 cases were:

1 to 10 years,	19 cases, or 2.9%
10 to 20 years,	161 " or 25.1%
20 to 30 years,	230 " or 35.9%
30 to 40 years,	120 " or 18.7%
40 to 50 years,	64 " or 10%
50 to 60 years,	27 " or 4.2%
60 to 70 years,	9 " or 1.4%
70 to 80 years,	1 case, or .15%
Age not given,	9 cases, or 1.4%

640 cases

The whole number of herniæ following appendectomy was 65, or 10%. Twenty-three, or 35.4%, were female, and 42, or 64.6%, were male.

The whole number of drained cases was 309, or 48.2%.

The whole number of undrained cases was 331, or 51.8%.

Fifty-two cases, or 17%, of the 309 drained cases, had hernia in the cicatrix of operation; 16 cases were female and 36 cases were male.

Thirteen cases, or 3.9% of the 331 undrained cases, had hernia in cicatrix of operation. Seven cases were female and 6 cases were male.

FREQUENCY OF PREVIOUS ATTACKS IN THE 640 CASES.

No previous attack,	226 cases, or 35.3%
One previous attack,	115 " or 17.97%
Two previous attacks,	128 " or 20%
Three to five previous attacks,	85 " or 12.97%
Five to ten previous attacks,	26 " or 4.1%
Ten to nineteen previous attacks,	2 " or .31%
Many, frequent, constant, etc.,	58 " or 9.0%

640 cases

* Read by title at the meeting of American Surgical Association, Denver, Colo., June, 1911.

SEVERITY OF ATTACKS.	
Moderate,	290, or 45.3%
Severe,	349, or 54.6%
Not mentioned,	1
	640

matology or clinical picture may be very moderate in intensity and yet the findings may suggest an acute process in the appendix. And, vice versa, few changes may be present in the appendix, either gross or microscopical, and yet the attack

The results were obtained in 1 case, 6 months after operation.

"	"	"	"	"	45	"	1 year	"	"
"	"	"	"	"	9	"	2 years	"	"
"	"	"	"	"	2	"	3 "	"	"
"	"	"	"	"	4	"	4 "	"	"

The number of cases which reported from one to five years after operation was 61.

may be most severe and acute. It seems unwise to attempt upon a clinical basis a differentiation

The results were obtained in 24 cases, 5 years after operation.

"	"	"	"	"	88	"	6	"	"
"	"	"	"	"	113	"	7	"	"
"	"	"	"	"	70	"	8	"	"
"	"	"	"	"	101	"	9	"	"
"	"	"	"	"	29	"	10	"	"
"	"	"	"	"	48	"	11	"	"
"	"	"	"	"	35	"	12	"	"
"	"	"	"	"	28	"	13	"	"
"	"	"	"	"	24	"	14	"	"

The number of cases which reported from five to fifteen years after operation were 560.

of the acute and the chronic cases in this series. So long as the clinical facts are stated, and so

The results were obtained in 12 cases, 15 years after operation.

"	"	"	"	"	2	"	16	"	"
"	"	"	"	"	1	"	17	"	"
"	"	"	"	"	1	"	18	"	"
"	"	"	"	"	1	"	19	"	"
"	"	"	"	"	1	"	21	"	"
"	"	"	"	"	1	"	a number of years	"	"

The number of cases which reported from fifteen to twenty-two years were 18.

Condition reported as good, very good, excellent, well, perfectly well, O. K., etc., 606 cases; or 94.6%.

Of these 606 cases, 95 reported health better than before operation.

Condition reported as poor *after* operation, 26 cases, or 4.6%.

In this series of cases reporting poor health after operation there was mentioned:

No cause,	7 cases
Indigestion in,	6 "
Troublesome hernia in scar in,	2 "
Peritonitis following operation in,	2 "
Diabetes following operation in,	2 "
Phlebitis following operation in,	1 case
Gallstones were diagnosed in,	1 "
A panhysterectomy was done at time of operation in,	1 "
Patient died of cancer within a year in	1 "
Post-operative neurasthenia in,	1 "
Sacro-iliac disease occurred in,	1 "

26 cases

Condition reported as health poor before *and* after operation were 8 cases.

In these reports were mentioned 2 right inguinal herniæ, 1 double inguinal hernia and 1 case with both inguinal rings enlarged and with impulse on cough.

There were 4 cases of phlebitis following operation.

There were 9 cases reported as "nervous" after operation.

It is difficult at times to determine from the study of the record of a case whether the patient had an acute appendicitis or whether it was an appendicitis of chronic type. The clinical sympto-

long as the pathological findings are stated, nothing is omitted whereby the division into acute and chronic might be made.

It is reasonable to suppose that the cases which were drained were acute cases. Upon this basis, 48.2% were acute cases and 51.8% were chronic cases.

There are a few exceptions to this method of division. There doubtless were reasons for draining the abdominal wound other than an acute process in or about the appendix. Such cases were possibly as follows:

Case 198. Bowel torn and repaired. Wound drained though there was no pus mentioned.

Case 326. Mass of adhesions. Two grape seeds. Wound drained.

Case 634. Tied down by adhesions. Wound drained. Had trouble with gallstones.

Cases like the three mentioned must be excepted from this classification. Otherwise the classification holds satisfactorily.

PATHOLOGICAL AND OPERATIVE REPORTS.

Appendix normal,	13
No report,	23
Appendix enlarged,	106
Appendix clubbed,	7
Appendix gangrenous, perforated,	167
Few adhesions,	79
Delicate adhesions,	20
Dense adhesions,	167
Pus,	204
Serum,	81
Blood,	12

Cases reporting so-called "subsequent attacks":

No. 5. Complains of thirty or more attacks accompanied by nausea and vomiting. Has ulcers in the scar. Previous history of scrofula. Health fair at

present, six years after operation. Nervous and hysterical before operation.

No. 21. Complaints of one attack. Health good except for "heart trouble." Previous to operation attacks for eleven years.

No. 78. Has occasional attacks. Health miserable. Previous neurasthenia.

No. 83. Has had similar attacks of pain as before operation. Has not worked since, as does not feel equal to it. Appendix was normal. Condition before operation not mentioned.

No. 86. Had right-sided pain after operation. Not well. Died in four years of unknown cause. Condition before operation not mentioned.

No. 119. A few attacks, not severe, and located near scar. Has lost weight and is somewhat constipated. Appendix atrophied. General health fair previous to operation.

No. 133. Four attacks lasting about two days. Health fair. More constipation. Condition not mentioned before operation.

No. 140. Several, lasting from a few hours to several days. Health good. Condition before operation not mentioned.

No. 164. One attack seven years after operation. Health excellent. Bowels regular. Condition before operation not mentioned.

No. 177. Once in a while. Has hernia in "that region." Condition before operation not mentioned.

No. 211. Off and on for three years. Health good bowels more regular. Condition before operation not mentioned.

No. 221. Several with piercing pain. Health good. Condition before operation not mentioned.

No. 232. "Quite often." Hernia size of grape fruit. Fair health. Malaria before operation.

No. 235. One attack, cured by physic. Health improved. Condition before operation not mentioned.

No. 271. Several attacks two years after operation. Has become neurasthenic since operation. Looks well. Condition before operation not mentioned.

No. 290. One attack, lasted one-half hour. Excellent health. Condition before operation not mentioned.

No. 305. Has attacks but not so severe as before operation. Health not so good. Bowels alternate between constipation and diarrhea. Condition before operation not mentioned.

No. 310. Two attacks. Pain for three to four weeks. Health good. Condition before operation not mentioned.

No. 311. Attacks. Always discomfort. Good health. Inflammation of bowels every year for five years before operation.

No. 319. Attacks at first. Good health. Condition before operation not mentioned.

No. 334. Attacks. Health poor. Condition before operation not mentioned.

No. 350. Several similar attacks at first. Health good. Condition before operation not mentioned.

No. 366. Constant attacks rather higher up. Health good. Constant indigestion. Condition before operation not mentioned.

No. 445. One attack two months after operation. Health good. Condition before operation not mentioned.

No. 462. Five to six attacks nearly as bad as before. Health improved. Condition before operation not mentioned.

No. 463. Two attacks six months after operation. Health improved. Condition before operation not mentioned.

No. 482. One attack five years after operation.

Health improved. Condition before operation not mentioned.

No. 500. Two attacks. Health good. Condition before operation not mentioned.

No. 517. Two or three short attacks. Health improved. Condition before operation not mentioned.

No. 520. Attacks. Health excellent. Bowels always loose with attacks of diarrhea. Condition before operation not mentioned.

No. 536. Attacks. Never got strength back. Condition before operation not mentioned.

No. 537. "Yes, when constipated." Health good. Condition before operation not mentioned.

No. 551. One, lasted several days. Health good. Digestion poor. Condition before operation not mentioned.

No. 563. One attack. Good. Dyspepsia before operation.

No. 573. One attack at first. Health never very good. Condition before operation not mentioned.

No. 621. Attacks. Health excellent. Condition before operation not mentioned.

No. 625. One attack. Health poor. Operation for hernia in scar one year after appendectomy. Hysterical before operation.

The numbers attached to the above cases indicate the number in the series of the 640 cases.

The attacks subsequent to the operation in the above 38 cases were the layman's idea of "an attack of appendicitis." They were not confirmed by the statement of a physician.

It will be noted from the variety of the disturbances spoken of as "attacks" that several of the cases were not genuine recurrences of appendix trouble. It will also be noted that in a large proportion of the cases the general health was pretty good in this group of 38 cases.

It is wise, of course, to keep in mind the fact that there is a distinction between a chronic attack of appendicitis and an exacerbation of a grumbling and persistent disturbance associated with pain and discomfort in the right iliac region, which so often disappears after an appendectomy, which very often is dependent upon purely mechanical conditions caused by previous inflammation of the appendix. These disturbances, too, are quite different from an acute attack of appendicitis of infectious origin.

These so-called "attacks" could not have been appendicitis in any form as the appendix had been removed in all these cases. It is of interest that certain of these cases seemed to have disturbances like the disturbances existing before the appendectomy.

From the analysis of these cases certain important facts appear.

The drained cases are more likely to have a hernia in the cicatrix following operation. The undrained cases are less likely to have a hernia in the cicatrix following operation.

The results were obtained in these cases from one to twenty-one years after operation, so that it is reasonable to regard these results as real end or ultimate results.

Ninety-four and six-tenths per cent of the cases were in good health and were relieved by the operation.

Four and six-tenths per cent had poor health after the operation. Analysis of the cases making up this percentage is given, showing that there was definite pathological reason for the persisting poor health.

It may be concluded in general that in this series of appendectomies the operation benefited the patient, that comparatively few unnecessary operations were done and that there were no distressing sequelæ.

It has been impossible to determine, of course, with absolute accuracy the occasion for post-operative pain. There were 88 cases in which it was thought that the discomfort, which was of varying degrees of severity, might be occasioned by adhesions following operation. This group of 88 cases has been secured after a very careful study of the reports of these patients, the 88 cases being 13.7% of the 640 cases.

Certainly the statement sometimes made that appendectomy is associated with distressing sequelæ is unfounded in this series of cases. Likewise the statement that appendectomy is often followed by no relief to symptoms is not borne out by these cases, 94% having been completely relieved.

INTERPRETATION OF LABORATORY FINDINGS.*

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WHILE the tendency of the up-to-date physician to rely implicitly upon the results of the laboratory is, to say the least, flattering to those of us who call ourselves clinical pathologists, we are apt as we become more scientific to lose sight of the clinical features of a case in our blind dependence on the laboratory. There seems to be no happy mean between the over-zealous laboratory enthusiast and those who entirely ignore this valuable adjunct to successful practice.

Far be it from me to underestimate the value of laboratory tests, but I wish to enter a plea for the consideration of all laboratory tests in combination with all the other clinical data obtainable. Laboratory findings are generally simply valuable symptoms and not infallible isolated signs, and laboratory results must be interpreted in the light of clinical signs and symptoms, for the sum total of all symptoms establishes the clinical identity of a disease.

Of course the ideal in medicine (here as elsewhere unobtainable) would be for each physician to be a trained clinical pathologist, but the time-consuming work, elaborate apparatus required, etc., make this impossible for the general practitioner, who by the way, is the man of greatest opportunities in medicine, and who can, accordingly, place a true value upon the reports of the pathologist. Some doctors try to shirk their responsibilities and save their own brains by expecting the laboratory to make their diagnoses for them.

* Read before the Central Medical Association, Middletown, Conn., March 13, 1911.

In some diseases we can practically make the diagnosis, notably in diphtheria, malaria, the primary anemias, chlorosis, leukemia, nephritis, syphilis, while in other diseases we can only assist in making a diagnosis by adding valuable data to the clinical picture.

The physician who does not diagnose tuberculosis until the laboratory tells him it is there is unworthy the name of physician, for in the majority of cases the tubercle bacilli, although an infallible sign of tuberculosis, do not appear in the sputum until long after the physical signs of tuberculosis are quite evident to the trained physician, and sometimes only in time for the signing of the death certificate. Although the diagnosis of tuberculosis does not depend on the finding of tubercle bacilli in the sputum, yet their presence is undoubtedly pathognomonic of a tuberculous lesion. If careful examination of the sputum is repeatedly made by the anti-formin method the tubercle bacilli are found much earlier in the disease than formerly.

BLOOD.

In the interpretation of blood examinations there are many factors which must be considered. A complete blood examination does not necessarily make a diagnosis, although often yielding invaluable information regarding the effect of pathological conditions upon the blood.

Aside from the essential blood diseases, pernicious anemia, the leukemias, malaria, filariasis, etc., much can be learned from the number of leucocytes, and the percentage of the different types of white cells, as the blood faithfully records the reaction of the system in many pathological conditions.

First, it is essential to know the normal and the physiological changes to which the blood is subject. The number of leucocytes normally may vary from 6,000 to 10,000, and may be increased by digestion, violent exercise, cold baths, massage and certain drugs, notably quinine, thyroid extract, and others. It is quite as essential to know the relative percentage of the different types of white cells. The polynuclear cells comprise the bulk of the leucocytes and average from 62 to 70%, the small lymphocytes 20 to 30%, large lymphocytes 4 to 8%, eosinophiles and mast cells $\frac{1}{2}$ to 1%.

It is very important to bear in mind that under ten years of age the polynuclear cells are normally low, from 18 to 40% according to the age, while the lymphocytes range from 40 to 60%, so that a polynuclear count of 60 or 70% in a small child would be equivalent to 90 to 95% in the adult.

By leucocytosis is meant an increase in the number of white cells above the normal for that individual. Now leucocytosis is really an index of the reaction of the patient to certain conditions and seems to depend upon the severity of the infection and the resisting power of the individual.

These factors interact:

1. Infection mild, and resistance good, you will get a small leucocytosis.