If the pathologist can accurately determine the above points he has accomplished much. The question of the probable duration of life as attempted by the microscopical examination of tumors has never appealed to me as anything more than a hazardous guess. There are so many clinical factors concerned in any case of malignancy that I feel certain prognosis cannot be accurately determined by the histological examination of tumors *per se*.

Mortality statistics are of great importance when properly controlled, but statistics in one clinic do not apply to all clinics. They are at best only a crude estimate of what we are all striving to accomplish, i. e., the prolongation of life.

Scholl's paper rightly brings out the point that tumors which are recognized early in development are the ones which offer the best chance for their complete removal. This, to me, is still the most important point when considering the treatment of malignancies.

A. A. KUTZMANN, M. D. (1052 West Sixth Street, Los Angeles)—Scholl has gathered together some interesting urological facts calculated to aid in prognosis. Clinicians have been in the past wont to consider the field of pathology as something apart from clinical medicine. It is of importance that the urological surgeon know and recognize histopathological features and not rely entirely on the pathologist. By such knowledge he will develop judgment in addition to just technical skill and so be able in most cases to foretell the course of events. The problem of prognosis is a great one and of practically as much importance as that of therapeusis. Scholl has shown with what probability the urologist can prognosticate within certain limits. It will, of course, never approach mathematical accuracy, but by striving to achieve such a goal, we will pass from the stage of empiricism to that of fact, that is, within certain relative limits, since medicine is not an exact science and the human organism with its assorted ailments may vary so.

In discussing the relation of histology to prognosis, Scholl is opening a rather new field. No doubt many surgeons of great experience have gathered together such facts in their minds, but very few if any have recorded them. The figures as stated in the cases of prostatic and bladder tumors approximate the usual experience and outcome in those patients. The figures quoted under malignant kidney tumors I fear are far too optimistic. Everywhere in the literature and from our experience we have been impressed with the great mortality. In conjunction with Frank Hinman a survey of the field was made several years ago, when an ultimate mortality of over 90 per cent was found.

In conclusion, I wish to commend Scholl on his able dissertation of so dry but yet important a subject. It would be wise that everyone study and familiarize himself with the fundamentals of this paper, since in dealing with malignancies of the genitourinary tract some of the most fatal malignant tumors are encountered.

A. ELMER BELT, M. D. (Pacific Mutual Building, Los Angeles)—Here we have the clinician pencil and pad in hand invading the pathological laboratory in an effort to calculate the future of his patient. The severest test of any science is the reduction of its facts to a mathematical equation. The trial before us is: microscopic physical appearance equals what, in length of years? Scholl's answer is a striking confirmation of Broders' law of anaplasia as an index of prognosis: great deviation from the normal cell structure in malignant growth equals short duration of life for the individual.

The paper is far too brief for the considerable importance of its theme. The figures given permit no opportunity of critical analysis. To be criticized properly it must be read together with its brief bibliography which is largely from the author's pen, where are given in greater detail statistics which here are only scanned. It is then seen that a vast storehouse of material has been drawn upon, the accumulations of a clinic where uniform and marvelous applied technical skill is the rule. Uniform and vast as it is, one hesitates to acclaim too readily from its data the establishment of a biological law.

Broders' effort has pointed the way. He presents a theme which may call every clinician into the pathological laboratory, as Scholl has been called, asking not only "Is it cancer?" but "How long will my patient live?"

DOCTOR SCHOLL (closing)—The results following surgery for renal tumors are good, but they are not markedly different from those obtained at the present time in most big urologic centers. The majority of case reports of renal tumors, and especially of several recently published reviews, are of operations performed before urologic diagnosis had reached its present state of diagnosis. Practically all recent reports of results obtained in nephrectomy for tumor performed in European clinics are of cases done many years ago. Quite a contract in accuracy of diagnosis is offered between the status of 1895, when A. O. J. Kelly reported a large series of renal tumors, 72 per cent of which came to autopsy undiagnosed, and that of our present period, when ureteral catheterization and the pyelogram almost invariably permits correct diagnoses of tumors even in early stages when the lesions are small and operable. Stevens, who reviewed 348 reported cases of renal tumor as recently as 1923, stated that 85 per cent of hypernephromas had the three classical diagnostic points, hematuria, pain, and palpable tumor; pain and tumor suggest well-advanced cancer. Kretschmer found that this triad of symptoms occurred in one-third of his own, camparatively recently, operated cases.

I appreciate the interest and frankness of the men who have discussed my paper, and thank them kindly.

VOLVULUS OF ENTIRE SMALL INTESTINE WITH TORSION OF MESENTERY

CASE REPORT

By THEODORE C. LAWSON *

A white man of 40 years, machinist, entered the hospital unconscious, and died one and one-half hours later without regaining consciousness.

Five days prior to admission the patient complained of not feeling well, but ate a hearty dinner. A few hours later he vomited, which act was repeated at intervals during the evening and night, accompanied by a choking sensation, but with no pain. He returned to work the next morning, but the vomiting continued, and was of a yellow fluid nature, not foul. Two days after the onset he had two convulsions, each lasting about an hour. The day before admission he became delirious, and the vomitus, which had become more severe and persistent, began to have a fecal odor. The same day he was given a laxative, and one and one-half hours later he passed some pink-stained fluid.

P. H. Four years ago, following an attack of influenza, the patient began to have attacks of gas pains over the epigastric region which were always relieved by soda. He was frequently nauseated and vomited after meals, but he never complained of pain or tenderness of the abdomen.

P. E. On admission for his last illness the patient was in coma with twitching of extremities and facial muscles. The lungs were negative except for a few crepitant rales at both bases posteriorly. The heart rate was rapid, with heart sounds of poor quality, valvular in type. The abdomen showed slight distention below the umbilicus with slight rigidity of the recti muscles, but no masses were felt. Temperature, 100.6; pulse, 105; respiration, 28.

Autopsy Findings—In addition to other conditions in which we are not interested, the findings were as follows: Stomach dilated to twice its normal size, and contained

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undigested food with thin yellow material of fecal odor. The small intestine was involved in a massive volvulus with torsion of the mesentery, counterclockwise, for two complete turns, or 720 degrees. The gut involved included all that from one and one-half inches below the duodenal-jejunal juncture to within two inches of the ileocecal valve. The dorsal attachment of the mesentery to the small intestine was only one inch in length, just enough to contain the superior mesenteric vessels. The small intestine was dilated, brownish purple in color, with evidence of beginning gangrene. The mesenteric and colic veins were markedly dilated. The large intestine at the splenic flexure was found doubled up on itself and bound down with adhesions. The descending colon was collapsed and descended from the splenic flexure for about eight inches, when it became bound with adhesions, and curved upward and medially for five inches and then descended down just to the left of the vertebral column to the rectum.

In 1903 George T. Vaughan gathered from literature a total of sixty cases of volvulus of the small intestine, in twenty of which the volvulus was of the entire small intestine with torsion of the whole mesentery. To these he added the record of his patient who was operated on with complete recovery. Since then the following have been reported:

1914. Weible—personal case, operation, recovery. Summary of sixty-six cases of volvulus of the small intestine.

1917. Vaughan—personal case. No operation, death.

1917. Garrow—fatal case.

1920. Wise—personal case, operation, recovery.

1920. Sabawala—personal case, operation, recovery.

1920. Billington—fatal case.

1922. Heymann—fatal case.

1923. Tees—four cases of volvulus of small intestine. Two involved most of small intestine, both were operated on and died.

1924. Wheeler—personal case, operation, recovery.

The present case is the seventy-seventh to be reported. Out of this total there have been twenty-five recoveries, or 33.3 per cent, all of whom were operated on, showing excellent operative results and comparing very favorably with the very high percentage of fatalities found usually in other forms of intestinal obstruction. Several authors refer to having seen similar lesions, both in the operating room and at postmortem which were not otherwise reported, so the total number of cases should be much larger.

Incidence—The incidence of volvulus is indicated by the reports of the Massachusetts General Hospital where, during twenty years, there were tabulated 239 intestinal obstructions, 25 of volvulus. Ten were volvulus of the small intestine which in one included the whole small intestine with torsion of the entire mesentery. In the London Hospital during thirteen years there were 669 diagnoses of intestinal obstruction of which 27, or 4 per cent, were due to volvulus, and 7 involved the small intestine. Leichtenstern states that of 1500 intestinal obstructions, 33 (2 per cent +) had volvulus.

Age—Volvulus is definitely associated with adult life, the average age being 45 years. Tissier and Mercier reported a congenital case and several patients have been over 70 years.

Sex—One author reported 51 instances in men and 13 in women; another 32 in men and 27 in women.

Location—More than one-half of the cases of volvulus, according to Vaughan, are at the sigmoid flexure, fewer at the cecum, and fewest in the small intestine, where only a small proportion involve the entire small intestine. By far the greater number of patients with volvulus also have obstruction, in part at least, of the large intestine, principally due to the nonrotation of the mesentery and combined large and small intestine during embryonic life. Of the cases reported by Gibson 73 involved the colon, 58 the sigmoid, 15 other parts of the colon and small intestine.

Degree of Torsion—The degree of torsion in most instances has been 180 degrees. In two patients it was 90 degrees; in three including our present one it was 720 degrees. Garrow's patient had a twist three and one-half times or one of 1260 degrees. In most of the patients the direction of the twist was clockwise. Vaughan found it clockwise in twenty-four, and counterclockwise in two.

Etiology—The great majority of authors state that the commonest predisposing cause of volvulus is the presence of structural changes, mostly bands or adhesions, either of congenital origin or those formed by a previous peritonitis. Van Hook and Kanavel in Keen's Surgery, Allbutt and Rolleston and others of high authority state that volvulus has been reported due to old scar formation and chronic mesenteritis (Philipcowicz and Küttner), former operations with bands and adhesions (Whiting, Riedel, and Hübner), mesenteric cysts, habitual constipation and chronic intestinal stasis with traction on the mesentery (Bosquette and Delore). Most patients with volvulus have been known to have long mesenteries, i. e., with a greater distance between the posterior abdominal wall to the gut, permitting a greater range of motion of the mesentery and intestine during peristalsis. Congenital maldevelopment of the mesenteric pedicle in the shortening of its vertical attachment to the posterior abdominal wall was frequently present. In our patient the base of the mesentery was about one inch long, just enough to permit the passage of the superior mesenteric vessels. Also a final predisposing cause must be stated as a condition due to the nonrotation of the common mesentery and large and small intestine during embryological development, a rotation which usually takes place during the fourth fetal month. At this stage of development both the large and small intestine have a common mesentery and are both involved in this rotation, and as the colon is in the most dependent portion of the alimentary canal, it can be readily seen how the large intestine is most commonly involved in volvulus.

A new factor as to exciting cause of volvulus has been brought out by Tees, who shows that it is often due to the disordered peristaltic action of the intestine. A high percentage of volvulus in patients with intestinal obstruction is reported in the Slavs and Scandinavians. In 153 cases of obstruction collected by Faltin (Helsingfors) 78 or 51 per cent were due to volvulus, of which 22 per cent occurred

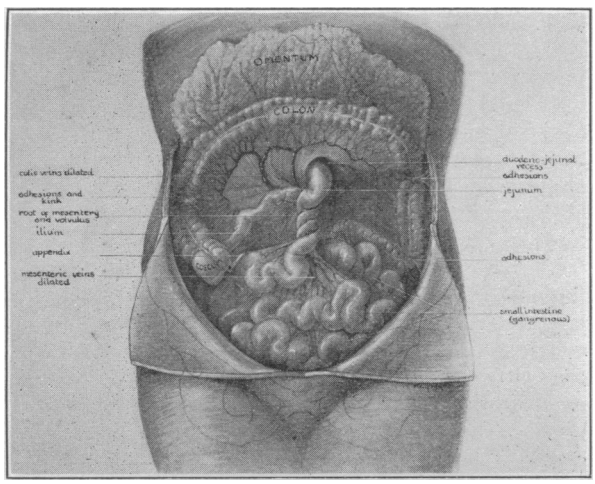

Fig. 1—Volvulus of the whole small intestine with torsion of the entire mesentery showing adhesions with anomaly of the large intestine.

in the small intestine. (Compare this with the report from the London Hospital.) These races are predominately vegetarian, and several authorities conclude that such vegetarian or bulky diets result in intestinal atony or chronic distention, thus largely contributing to a twisting of the bowel. It has been further pointed out that the proximal portion of the bowel distended by active purgation acting against a distal paralytic and collapsed part will largely contribute to the formation of a volvulus.

Symptoms — Prolonged constipation is the rule with attacks of abdominal discomfort, or pain with vomiting. Our patient, it has been seen, would vomit at the least provocation, and had a history of gastric distress for four years. This vomitus, however, is seldom fecal, as the bowel cannot empty itself in either direction when the volvulus involves the entire small intestine. Usually the vomitus is bilious or dark colored, blood is seldom vomited or passed in the stool, even though free blood or sanguinous fluid may be present in the peritoneal cavity and in the intestine. Abdominal pain is variable. Our patient had no pain. Many patients are often seized suddenly by generalized abdominal severe pain, usually centering about the umbilicus. It is plausible to assert that pain is sudden, severe, accompanied by shock where the twisting is sudden, causing an acute obstruction, and may be absent or a minor symptom in chronic obstruction. The abdomen is usually rigid, distended, and tympanitic. A rectal or vaginal examination may at times show a boggy mass in the rectovesical or the rectovaginal pouch. Temperature may be normal, above or below normal. Pulse is usually normal until collapse occurs.

Diagnosis—In the majority of patients it is impossible to make a more definite diagnosis than that of intestinal obstruction, and that is enough to indicate immediate laparotomy. The most unfortunate mistakes are liable to be made when a volvulus is associated with a visible hernia. Usually an actual diagnosis other than obstruction is impossible.

Prognosis—Without operative relief the mortality is 100 per cent. Of the total of the 77 cases recorded 57 were operated on, with recovery of 25, or 43.8 per cent. All the successful operations were performed within less than forty-eight hours after the patients were first seen. Some reported operations were from ten hours to nine days after the symptoms began. The cause of death in these instances is due to injury to the sympathetic plexus produced by strangulation of the small intestine and rapid absorption of toxins.

Treatment—Operation as soon as diagnosis is made is the only hopeful method of treatment. That a difficulty in diagnosis can be met even after the abdomen is opened is borne out by the fact that four operators—Debrie, Kirmisson, Delbet, and Delore—were unable to find the real cause of the obstruction. The detorsion of the volvulus is all that has usually been done, which seems to have proved all that was necessary, although Philipcowicz advocates a suturing of a portion of the mesentery to the posterior abdominal wall.

REFERENCES CITED

Billington, C. M.: Brit. Med. J., 1920, 2:549.
Bleecher: Deutsche Zentralbl. f. Chir. Leipsic, 98:521.
Bosquette: Dauphine Med. Grenoble, 1912, 36:217.
Bull, P.: Bull. et. Mem. Soc. de Chir. de Par., 1907, N. S., 33:4.
Burgess, Arthur: Lancet, Lond., 2:1690.
Clement, Pierre: Bull. Soc. Anat. de Par., 1905, 80:737.
Danielson, Wilhelm: Beitr. z. Klin. Chir., 1906, 48:100.
Debrie, E. J.: Archiv. de Med. et Pharm. Militaire, Paris, 1900, 36:324.
Fantino, G.: Il Morgagni, Milano, 1911, 48:743.
Garrow, R. P.: J. Roy. Med. Corps. Dec., 1917.
Heymann, E.: Deutsch. Med. Wochschr., 1922, 48:725.
Homans, J.: Bost. Med. and Surg. J., 1898, 139:315.
Hutchinson, Jonathan: Clin. J. London, 1907, 30:113.
Küttner: Munchen. Med. Wochschr., 1905, 3:482.
Lawson, C. B.: J. Royal Army Med. Corps., Lond., 1906, 7:593.
Philipcowicz, W.: Arch. f. Klin. Chir., 1905, 76:934; Arch. f. Klin. Chir., 1912, 97:884.
Sabawala, B. P.: Brit. Med. J., 1920, 1:221.
Shepherd, F. J.: Montreal Med. J., 1899, 18:46.
Vaughan, G. T.: Am. Jour. Obst., 1907, 56:187; Virginia M. Semi-month., May, 1917, 22:89.
Weible: Surg. Gyn and Obs., 1914, 19:644.
Weksner, B.: Zentralbl. f. Chir., 1924, 51:2129.
Williams, C. L.: Indian Med. Gaz. Calcutta, 1901, 36:457.
Wise, W. D.: Journ. Amer. Med. Assoc., 1920, 7:4 1165.
Whiting, O. D.: J. Med. Sci., 1903, 15:799.

Vice-President Lee K. Frankel, Metropolitan Life (Health and Empire, June, 1926), relates that life insurance companies have "touched only slightly" the problem of syphilis. They have not held back because of lack of interest, but because syphilis (and other venereal diseases) is "so personal and intimate" that there are "peculiar difficulties in working out an effective plan."

Statistics gathered by the insurance companies appear to indicate a minimal "extra mortality" of at least 50 per cent among syphilitics who had been treated for two years, and who were free from symptoms for another year.

After deploring the incompleteness of morbidity and mortality statistics, realized by everyone as so inadequate as to be practically valueless, Frankel believes that because of intimate relation between carrier and policyholder "it is questionable whether the insurance company may intrude itself into the privacy of the policyholder's home to carry on a campaign of social hygiene." So the insurance companies "have left this type of work to public health agencies."

"However," says the author, "the day may not be far distant when insurance companies may undertake a comprehensive educational campaign."