

cuts the external oblique fibers obliquely. This incision was described by Elliott of Boston some ten years before Dr. Rockey described it. It seems to me that it is greatly superior to the incisions of Lennander, Battle, Jalaguier and Kammerer, which divide the abdominal nerves which enter the rectus transversely. The closure of the incision is very simple, because these cut fibers of the external oblique will in all instances, in my experience, at least, submit to imbrication. Boeckman has used this incision for over ten years, and at his solicitation I began using it. I make the incision high up or low down, depending on the pathology I expect to find. The incision avoids important nerves and as Dr. Rockey has said, will drop together almost without a suture of any kind. It is closed in the same manner as the McBurney incision, excepting that the cut fibers of the external oblique may overlap. With this incision one may secure an opening reaching from the anterior superior spine to the midline. As I have been removing the appendix, at least in all of the simple cases, under local anesthesia, I feel that I have given the incision a severe trial.

DR. A. V. MOSCHOWITZ, New York: The remarks I am about to make may not be germane to the subject, because thus far at least I have had no chance to use the transverse incision in appendix operations. I have been perfectly satisfied with the McBurney or the Kammerer incision. I have used the transverse incision, however, in the upper abdomen for a number of years, and have become so satisfied with this, that I now consider it part of my normal incisions for all operations above the umbilicus. There is a principle involved in the transverse incision. One of the points I wish particularly to mention is that in gall-bladder operations and in all operations on the stomach it gives perfect exposure and is very easily sutured, and the patients have little postoperative discomfort and distress from distention, no hernia and a minimum amount of scar; the wound heals kindly. In my experience the operation is exceedingly simple; the entrance through the abdomen is a trifle more difficult because of hemorrhage, but this is counterbalanced by the ease we have with the final suture. It can be made any length. The ease of closure in particular, in spite of the drawbacks, surely warrants a more extended trial of it.

DR. J. CHRIS O'DAY, Portland, Ore.: Dr. Rockey saw me do a McBurney incision and asked me if I had tried his transverse incision. I said no. Dr. Rockey cannot tell you just how, but try it and when you do you will stumble into the easiest abdominal incision you have ever seen.

DR. O. O. WITHERBEE, Los Angeles: To further corroborate what Dr. Rockey has given us, I wish to say that in simple cases of appendicitis it is one of the most satisfying procedures I have had the pleasure to employ. I would even like to simplify, if I could, the description he has given of the method of entering the abdomen. After the skin incision is made you need no more cutting. On reaching the muscles one little clip with the Mayo scissors in the external oblique, and then opening the scissors enlarges the incision to a sufficient extent. The same procedure is effective in the next layer and very quickly you expose the peritoneum. With forceps this is lifted up and an opening is made into the peritoneal cavity. Previous injection with novocain blocks the nerves and avoids the deep anesthesia that would otherwise be required. In the majority of cases it is not necessary to pass more than one finger into the abdominal cavity to hook up the appendix, and in a few moments your operation is completed. A single stitch is sufficient in closing the muscles. With this method one can hardly realize that he has been into and out of the abdominal cavity.

DR. A. E. ROCKEY, Portland, Ore.: Dr. Farr called my attention to Dr. Elliott's having already previously used the transverse incision, but it is not mentioned in the textbooks. A French author published a description of a similar transverse incision the same year of my publication. It is evident that the natural advantages of the incision made it apparent to others. The surprising point is that there is no other incision made for the radical case. I prefer to make

the incision high. There is not much advantage in making the incision down where Davis has described it, for the reason that the mesenteries of the cecum are high and not low, and when the cecum falls down lower it is not attached below except by accidental processes, so that in the great majority the cecum can be turned out, and in the best cases the drainage point is in a better location with a high incision. At this point of the aponeurosis of the external oblique it is not necessary to cut the muscle fibers at all, as when you get to the outer part in this spreading motion which I have described, with one movement the fibers of the external oblique spread forward widely.

RIGHT-SIDED HYPERTENSION WITH OCCASIONAL CARDIAC DILATA- TION AS POSTOPERATIVE COMPLICATION *

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The literature and individual experiences abound with instances of acute dilatation of the heart in the course of and following such acute infectious diseases as pneumonia, diphtheria, etc.

Athletes are required to train for events entailing unusually severe exertion. That acute cardiac dilatation often occurs among those who enter Marathon races has been abundantly demonstrated by roentgenograms of the heart. Persons with weakened myocardium caused by the stress of excessive business or social cares, by marked anemia, or by the prolonged absorption of bacterial toxins, biliary poisons, etc., are warned to avoid sudden, excessive exertion. Transitory or fatal dilatation of the heart may readily occur when these very ordinary precautions are disregarded.

To perform surgical operations in the presence of such depressing agencies is to take serious risks which must be minimized in every way if even a reasonably safe outcome is to be expected.

To impose on such hearts the burden of a general anesthetic throughout a prolonged operation done with the patient in the extreme Trendelenburg position, and later to give unnecessarily large intravenous injections of normal salt solution, would be to multiply these dangers instead of minimizing them.

Wertheim¹ has reviewed 500 consecutive hysterectomies for uterine carcinoma. Of that series ninety-three patients died. All who died were subjected to necropsy. Even at necropsy, acute dilatation of the heart was found as the sole cause of death in twenty-two instances.

When one series of hysterectomies for cancer done at a world-famous clinic shows a death rate of 4.4 per cent. from this one cause, I need present no further evidence to prove that it is a factor in postoperative mortality.

While I was visiting the Lakeside Hospital at Cleveland about five years ago, Crile was doing a direct transfusion of blood from husband to wife preparatory to a serious operation on the anemic woman. Crile called attention to the fact that it was very easy to dilate the heart if blood went across too quickly.

* This article embodies the essential features of the Chairman's Address, read before the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, June, 1913. The complete paper, with charts, tracings, drawings and roentgenograms, appeared in the transactions for that year.

1. Wertheim: Die Erweiterte Abdominale Operation bei Carcinoma Colli Uteri, Vienna, Urban and Schwarzenberg.

Indeed, as he spoke, it occurred before our eyes. The face of the patient was slightly suffused, breathing became shallow and more frequent, the pulse quickly became accelerated, and the area of the right heart was increased as shown by percussion. The transfusion was temporarily stopped, the woman's head was elevated and her circulatory equilibrium was quickly restored. After a few minutes she was given more blood, and then a successful operation was done.

The ease with which dilatation of the heart was produced, the absence of precordial distress, the slight change in the patient's condition, and the readiness with which it was controlled, when recognized at its very inception, were a revelation. I had expected to see a picture of extreme gravity when cardiac dilatation was imminent. But here it had occurred, had presented no picture of extreme gravity, was promptly recognized and was promptly controlled.

This incident recalled to my mind a number of patients observed in my experience as an assistant and in my earlier individual work. The patients fell into two groups. In one group were those who were weakened by disease and had failed to rally after desperate operations. The pulse when they reached their beds was probably 130 and small; the patients were restless and seemed to have lost their courage. Instead of returning promptly to normal, the pulse rate and quality grew progressively worse, until a fatal termination was reached, from twelve to thirty-six hours later.

In the other group this clinical picture developed suddenly, from eighteen to forty-eight hours after operation. It was thought at that time that the weakened circulation was probably due to a small volume of blood and to cerebral anemia. Following the practice of the times, the foot of the bed was elevated and a liter or more of normal salt solution (with or without epinephrin) was given into a vein. We were puzzled and dismayed by a rapidly fatal termination in spite of what we were pleased to consider our beneficent efforts. Nor do I believe our experience was in any way unique.

In the light of Crile's work on transfusion, it then seemed to me that our cases may have been instances of acute cardiac dilatation, and that it would be worth while to apply his principles to our work. Each time the syndrome appeared thereafter, the patient's head was slightly elevated, fairly vigorous stimulation was begun, and a competent internist was asked to examine the heart.

Our records in the period during which we have been looking for this affection show fourteen cases in which grave circulatory disturbances and probably acute dilatation of the heart were then thought to have occurred. All the patients recovered.

A fairly extensive review of the literature shows a considerable number of excellent papers on acute cardiac dilatation during chloroform narcosis, in the course of and as a sequel to acute infectious diseases, after sudden overexertion, etc. Except the recent article by Gatch, Gann and Mann,² very little indeed has been said of this affection as a postoperative complication when ether is used.

Our conception of the clinical picture was therefore gradually formed; indeed, it is not perfectly clear as yet. We have, however, formed the definite plan

of looking with suspicion on patients whose myocardium may be presumed to have been weakened by hyperthyroidism, prolonged or very recent absorption of bacterial toxins (such as those of pneumococcus, streptococcus, diphtheria bacillus, etc.), of biliary poisons, of toxins from malignant neoplasms, by marked or prolonged anemia, etc. When after operation, particularly in these cases, we observe a rapid pulse that does not come promptly to normal, we look to the central circulatory system for the cause until other adequate explanation is found.

When the pulse, having fallen toward 100 after operation, shows an abrupt rise of twenty or more beats at any time during the succeeding two or three days, we expect to find one of the following causes for that disturbance: hemorrhage, atropin, right-sided hypertension, dilatation of the stomach or the rapid absorption of toxins surrounding a pelvic drain. This is usually precipitated by increased intrapelvic pressure following an enema.

If to the rapid pulse is added a slight cyanosis, sudden decided weakness, decided apprehension, etc., with increased area of the right heart, the clinical picture is probably that of increased venous tension and should be treated as such.

With this picture in mind we have made a review of our last 2,100 consecutive abdominal sections, which shows that there were forty-nine deaths—a mortality of 2.33 per cent.

Analysis of the last 2,000 abdominal operations shows that the syndrome of circulatory embarrassment due to right-sided hypertension or to cardiac dilatation was observed only forty-two times, or in 2 per cent. of our abdominal operations.

As conclusions arrived at previous to Feb. 15, 1913, were based largely on clinical observations, it was determined to make parallel observations along the following lines:

1. A series of physiologic experiments on dogs, directed by Dr. Clyde Brooks of Pittsburgh.
2. A systematic study, by Dr. H. G. Schleiter, of the circulation with cardiac measurements before and after operations in a series of patients subjected to abdominal operations.
3. Systematic Roentgen-ray studies, by Drs. Russell H. Boggs and Joseph Foster, of the same series of patients based on pictures taken under like conditions before and after operation.
4. A continuation of the clinical work with an analysis of findings in the series of patients studied by Dr. Schleiter and by roentgenograms.

PHYSIOLOGIC MAMMALIAN EXPERIMENTS

The plan of these experiments was to study, on the one hand, the circulation of normal dogs, and on the other hand, that of dogs with weakened circulation caused by hyperthyroidism, or by long subjection to methods commonly employed in operating rooms, or in the postoperative treatment of patients. Dogs were completely anesthetized with ether. Both venous and arterial manometric blood-pressure tracings were recorded on the drum, while the dogs were kept in Trendelenburg, Fowler's and in horizontal positions, and also during the intravenous injection of salt solution.

In some instances the thorax was opened so that the heart and great vessels could be directly observed.

2. Gatch, W. D.; Gann, Dewell, and Mann, F. C.: The Danger and Prevention of Severe Cardiac Strain During Anesthesia, *THE JOURNAL A. M. A.*, April 26, 1913, p. 1273.

The results of these experiments may be briefly summarized as follows:

1. On a vigorous dog with normal circulatory apparatus:

In all instances, change of position caused a very slight and transitory change in arterial and in venous pressure.

When the animal was placed in a marked Trendelenburg position there was a momentary slight decrease in arterial pressure and later a slight fall in venous pressure. When 0.9 per cent. sodium chlorid solution was rapidly injected through the external jugular vein, there was a sudden great increase in venous pressure followed by a rise in arterial pressure with a synchronous increase in amplitude of heart beat recorded on the tracing. In other words, the normal vigorous heart responds to the stimulus of increased burden by efficiently performing the added work, and in connection with the normal vasomotor mechanism by quickly reestablishing and maintaining circulatory equilibrium.

These observations are in accord with those of Crile, which directed our attention to this subject.

2. On the dog with weakened circulatory apparatus:

Conversely, we here observed that when the circulatory mechanism of the dog is weakened by any of the causes mentioned before, instead of responding to the stimulus of increased work, it is overwhelmed and shows evidence of embarrassment.

This series of experiments includes those dogs with circulatory apparatus weakened by hyperthyroidism, by prolonged ether anesthesia, by the extreme Trendelenburg position, and by intravenous injections of 0.9 per cent. sodium chlorid solution.

Our experiments on all of these dogs weakened by the foregoing conditions yielded essentially the same results.

Having taken the normal tracings for the dog in the horizontal position, we then raised it to the extreme Trendelenburg position. There followed a decided increase in arterial and venous pressure. The pressure did not return completely or quickly to the normal level for the horizontal position. The weaker the dogs were, the slower and less complete was the return.

Having been kept in the extreme Trendelenburg position for a time, they were then replaced in the horizontal position, whereupon the venous and arterial pressure returned and remained normal. Next the caudal extremity of the dog was lowered (Fowler's position). There followed a corresponding diminution in arterial and venous pressure.

In some experiments, the thorax and pericardium were opened for the purpose of examining the heart by direct inspection and palpation. It was found that when the dogs were in the extreme Trendelenburg position there was a decided increase in the venous tension, with a corresponding slight dilatation of the right auricle and great veins. Next the dog was lowered to the horizontal position, and later the caudal extremity was lowered to the Fowler position. There resulted a reduction in venous tension and tension of the right auricle corresponding to the tracings in the same positions previously obtained.

The next step was to embarrass the heart further by rapid intravenous injections of large quantity of normal salt solution into the external jugular

vein. It was found that there was a marked increase in tension in the great veins and right auricle, with some dilatation of the veins and auricle, followed by increased dilatation of the right auricle, dilatation of the right ventricle and still later by dilatation of the left auricle and ventricle. After the saline injection was discontinued, if the heart was in fair condition, this added volume of salt solution was quickly distributed into the vascular tree, and the circulation returned to its normal equilibrium. On the other hand, if the heart was in poor condition, there followed arrhythmia, lowered arterial pressure and other evidences of a failing circulation. In one instance, that of a vigorous dog with normal heart which was kept for a long time in the Trendelenburg position without causing any embarrassment of the circulation, the thorax and pericardium were opened, the heart was exposed, and the ventricles were thrown into fibrillation by induced electric current. Immediately the auricle and great veins became dilated and the circulation promptly failed.

It was observed that the dogs having large thyroids and suffering from hyperthyroidism yielded more quickly and more profoundly than normal dogs to the depressive influences of posture, ether and intravenous injections of normal salt solution, etc.

TABLE 1.—COMPARATIVE MEASUREMENTS OF PREOPERATIVE AND POSTOPERATIVE ROENTGENOGRAMS

Area	Result	Times Observed
Vascular	Increased	58
Cardiac	Increased	32
Vascular	Normal	22
Cardiac	Normal	23
Vascular	Diminished	10
Cardiac	Diminished	35

It appears to be reasonable to consider the weakened circulatory apparatus of the dog, comparable to that of the weakened circulatory apparatus of the patient suffering from the following conditions: prolonged profound anemia, hyperthyroidism, absorption of bacterial or biliary poisons, etc.

OBSERVATIONS ON THE CARDIOVASCULAR SYSTEM
OF 115 PATIENTS SUBJECTED TO
ABDOMINAL OPERATION

In view of the small percentage of instances in which serious central circulatory embarrassment occurred in the series of 2,100 abdominal operations, it seemed quite possible that our present series of 100 might fail to show a single instance. On the other hand, it was thought that at any rate some suggestive observations might be made. As a matter of fact, with one possible exception, there was no instance of cardiac dilatation to report in this series of observations.

One hundred and fifteen cases were studied to observe the change undergone by the cardiovascular system as a result of major abdominal operations under ether, cocain, novocain or a combination of these anesthetics.

The uniform method applied in all cases was to obtain the following data:

1. A brief history as to the occurrence of scarlet fever, diphtheria, throat infections, pneumonia, typhoid and rheumatic fever.

2. A history as to any previous cardiac condition. This save for occasional palpitation was negative in every case.

3. An examination of the blood-vessel walls.
4. Record of the rate, rhythm and quality and character of the radial pulse before and after operation.
5. The blood pressure, systolic and diastolic, pulse pressure and venous pressure before and after operation (in sixty-four of the series).
6. The dimensions of the heart to the right and left of the midline at the base of the third interspace before and after operation, determined by percussion and auscultatory percussion. It was not attempted to locate the apex, as this is too uncertain in female patients.
7. The character of the heart sounds.

TABLE 2.—INCREASE AND DECREASE IN VASCULAR AND CARDIAC DISEASES

Increased				Decreased			
Vascular Area		Cardiac Area		Vascular Area		Cardiac Area	
mm.	No. Cases	mm.	No. Cases	mm.	No. Cases	mm.	No. Cases
1	1	1	1	1	1	1	2
2	5	2	4	2	1	2	2
3	10	3	3	3	1	3	1
4	10	4	5	4	2	4	4
5	11	5	4	5	0	5	6
6	7	6	4	6	3	6	1
7	2	7	1	7	1	7	1
8	3	8	2	..	..	8	7
9	0	9	1	..	..	9	0
10	1	10	2	..	..	10	2
11	2	16	1	..	..	12	1
12	1	22	1	..	..	14	3
..	..	..	..	..	..	15	2
..	..	..	..	..	..	16	1
..	..	..	..	..	..	17	1

The study of the cardiovascular system in 115 consecutive abdominal operations failed to show any case of marked right-sided hypertension. In two instances, however, the circulation showed embarrassment consistent with an increase in venous tension, or the early stages of the condition under consideration.

One patient who showed considerable cyanosis with rapid pulse and sudden weakness on the table, though showing nothing noteworthy in her percussion outlines, gave evidence in roentgenograms of a slight diminution in the heart's transverse diameter, coincident with an increase in diameter of the great veins at their point of entry into the right auricle. There was noted also a systolic murmur at the left of the sternum lasting not more than twenty-four hours. The cause of this murmur was not determined, though it seems possible that it might have been due to a temporary change in the tricuspid ring caused by venous and right auricular dilatation.

The case with a rapid pulse twenty-four hours after operation, from 140 to 100, though giving no evidence of change in the heart's outline, showed at this period an increase of venous pressure as shown by the sluggish emptying of the vein at the hand, which had to be lifted 12 inches above the level of the heart before the vein flattened. The roentgenogram of this patient showed the transverse vascular measurement to be increased 4 mm., while the heart measurements were unchanged. Here the picture seems typical of a slight transitory increase in pressure in the right auricle and venae cavae, without, however, going to the stage of dilatation.

ROENTGENOGRAPHIC FINDINGS

From the series of 115 consecutive abdominal sections, one roentgenogram was made before operation and one or two after operation in seventy-five instances. The other forty were dropped from the

list for some definite reason, as two exposures on the same plate, failure to obtain the preoperative picture, such postoperative change of position as would prevent securing pictures that could be compared with those obtained before operation, etc.

These pictures were not studied until the entire series was completed. The series of pictures of each patient was illuminated and careful measurements were made with calipers and ruler, first in the vascular area between the arch of the aorta and the heart, and secondly, the broadest part of the heart.

The preoperative measurements were considered as normal for each patient. Some of the postoperative measurements were normal, others showed a fractional increase and others a fractional decrease. In strict conformity with the clinical course and clinical measurements, none showed a marked increase in the size of the cardiac or vascular areas. Among others, the two cases mentioned before showed a moderate increase in vascular measurements. A careful analysis of roentgenographic measurements, however, is very suggestive (Table 1).

These measurements are consistent with the view that the dilatation begins in the great vein.

In this comparative table there are five duplicates in the vascular measurements and fifteen in the cardiac measurements. The duplicates occur because of a variation in measurements made on pictures taken the day of operation and those taken the next day or the second day after operation.

Maximum cardiac measurements were more often observed on pictures taken the second or third day after operation. Thus, of the thirty-two times in which the heart measurements were increased after operation, two postoperative pictures were taken twenty-six times. Of these, the second picture (that is, the one taken from forty-five to seventy-five hours after operation) showed maximum measurements seventeen times, whereas in the first picture, taken the day of operation, maximum measurements were found only five times. In four instances the measurements were unchanged.

TABLE 3.—CASES WITH NORMAL CIRCULATION IN RIGHT-SIDED HYPERTENSION WITH VASCULAR MEASUREMENTS NOT RELATIVELY GREATER THAN CARDIAC

Area		No. Cases
Vascular	Cardiac	
Increased	Increased	22
Normal	Normal	8
Normal	Increased	7
Decreased	Increased	1

When the postoperative cardiac measurements were smaller than normal, the maximum reduction was noted the day of the operation nineteen times, the day after operation seven times, and in two instances the measurements were unchanged. In seven instances only one postoperative picture was taken, making the total of thirty-five in which a cardiac reduction was noted.

An analysis of measurements shows that with few exceptions, variations were slight. Thus in the fifty-eight instances in which there was an increase of vascular measurements, the increase was 6 mm. or less in forty-four cases, and 7 mm. or over in nine. In

only four instances were the measurements increased 1 mm. or more. None of the decreased vascular measurements exceeded 7 mm.

Of the increased cardiac measurements eighteen were 6 mm. or less, while four were as follows: two, 10 mm.; one, 12 mm.; three, 14 mm.; two, 15 mm.; one, 16 mm., and one, 17 mm.

CLINICAL OBSERVATIONS ON 115 CONSECUTIVE ABDOMINAL OPERATIONS

A review of the clinical records shows that the postoperative course was perfectly smooth in seventy-six out of 115 cases, notwithstanding the fact that many who were considered poor operative risks had serious operations. The pulse in sixty-nine cases scarcely varied ten beats during the forty-eight hours. In the seven other cases, the pulse fell about forty beats, from 120 or more within the first two hours, and remained normal thereafter.

Twenty-six patients, all but one or two of whom were rather poor operative risks and yet required very serious operations, showed a rise of pulse rate to 100 or less in four instances, 112 or less in twelve instances, 120 or less in six instances and 130 four

TABLE 4.—CIRCULATORY DISTURBANCES WHEN VASCULAR
MEASUREMENTS WERE RELATIVELY GREATER
THAN CARDIAC

Area		No. Cases	Normal	Abnormal
Vascular	Cardiac			
Increased	Normal	16	14	2 seriously ill; 1 had a drop of 40 beats or more on leaving table.
Increased	Decreased	16	15	
Decreased	Decreased	9	4	3 seriously ill; 2 had a drop of 40 beats or more on leaving table.
Normal	Decreased	7	5	2 had a drop of 40 beats or more on leaving table.

times. In all instances the pulse promptly fell to the normal (within eight or ten hours) and remained so, the further convalescence being normal.

It is thus seen that 102 of the 115 patients ran a practically normal and perfectly safe course. In the remaining thirteen instances the pathologic condition was more grave, circulatory disturbances were more marked and the postoperative condition more serious. Three of these patients died. One of these patients, a woman aged 66, with gallstones and large pancreatic abscess, died of pneumonia the eleventh day; the others died of peritonitis.

In no instance was the clinical picture of acute cardiac dilatation observed, though in one case there was decided cardiac embarrassment on the table as evidenced by cyanosis, weakness and marked acceleration of the pulse. In this case, roentgenograms immediately after operation showed increased vascular measurements but decreased cardiac measurements. The patient developed a systolic murmur which lasted one day. May she not have had a transitory tricuspid insufficiency?

A comparison of the postoperative condition of these patients and their clinical records with the Roentgen-ray findings is of some interest.

Though the typical clinical picture of marked increase in venous tension or acute cardiac dilatation

was not observed in this series of 115 patients, minor changes were observed. They would seem to warrant the following conclusions as regards right-sided hypertension.

1. When the vascular measurements were not relatively greater in proportion to the cardiac measurements, there was no circulatory embarrassment. In thirty-eight cases no embarrassment was observed.

2. When the vascular measurements were relatively greater than the cardiac measurements, circulatory disturbance did occur in 24 per cent. of the cases. In fifty cases embarrassment was observed twelve times.

It is our belief that these twelve cases represent the early stages of increased venous pressure or right-sided hypertension, and that if their circulatory apparatus had been somewhat further depressed, marked hypertension and then acute dilatation would have occurred in the following sequence: right auricular and ventricular and then left auricular and ventricular dilatation. Agencies which might readily have dilated these hearts are more ether, prolonged operation, prolonged extreme Trendelenburg position, or the rapid intravenous injection of large amounts of salt solution at the time the circulatory embarrassment existed.

SUMMARY

Right-sided hypertension does occur as a postoperative complication. It is usually slight and causes no alarming symptoms. It occasionally causes circulatory disturbance, always with a rapid pulse. In rare instances it goes on to right auricular dilatation or even to dilatation of the whole heart.

It is more likely to occur when the myocardium is weakened by disease. It may readily be precipitated or intensified by excessive ether, prolonged extreme Trendelenburg position or by the rapid intravenous injection of large quantities of salt solution while the heart is already embarrassed.

It should be promptly recognized and treated by slight elevation of the head of the bed, a little morphin and cardiac stimulants.

Jenkins Arcade Building.

RESULTS OF APPLYING A QUANTI- TATIVE METHOD TO THE ABDER- HALDEN SERUM TEST FOR CANCER *

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In a previous publication, one of the writers¹ reported a study of the value of the Abderhalden test for cancer, a comparative investigation with the dialysis method in cases of carcinoma, sarcoma and tuberculosis. As a substrate, carcinoma tissue was used for all the cases. Of thirteen carcinoma cases, twelve were positive and one negative; the sarcoma cases were all positive. Of twenty tuberculosis cases, nine were positive and eleven negative. The analysis of the results showed that the Abderhalden dialysis method cannot be considered as yet of real diagnostic

* From the Department of Cancer Research of the Montefiore Home and the Hospital of the Rockefeller Institute for Medical Research.
1. Levin, Isaac: Proc. New York Path. Soc., 1914, xiv, 115.