

THE WEAK SPOT IN AMERICAN SURGERY¹

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TO the outside world the members of a well regulated family usually present an unbroken front amid the cares and turmoil of a busy life. In the bosom of the family, however, all reserve is removed, and the various members feel themselves free to discuss one another's shortcomings and proffer suggestions as to the ways by which betterments may be made.

As members of the College of Surgeons we are in reality members of a large surgical family and it is not only our privilege but also our duty to speak out freely in these family gatherings, and to suggest means whereby the surgery of these United States and Canada may be improved.

When our distinguished colleague, Dr. Franklin H. Martin, who, more than any other man has been instrumental in the advancement of the College of Surgeons, asked me to speak at this state meeting I gladly consented, and in casting around for a suitable topic one subject kept continually presenting itself—*The Weak Spot in American Surgery*.

When we survey the surgical field and see what has been accomplished in abdominal surgery, in gynecology, in the surgery of the neck and recently of the brain, and remember how orthopedic surgery and surgery of the nose and throat have advanced we are naturally filled with pride. But let us not for a moment forget that the advancement along these lines has in large measure been rendered possible as a result of the fundamental labors of Pasteur, Lister, Koch, and a few others. Had it not been for the epoch-making discoveries of these men our remarkable advances in surgery would not have been possible.

Bacteriologists have not only shown us the way but have also in large measure removed the nightmare of tetanus by giving us a curative antitoxin.

SURGICAL PATHOLOGY

In some of the larger hospitals there has been a very close co-operation between the surgeon and the pathologist for the last 25 or 30 years. In these hospitals the surgical cases have been carefully described, the surgical procedures have been given in detail, the material removed has been examined macroscopically and microscopically, the immediate and after-results have been recorded with precision, and finally, the composite picture of the given surgical disease has been followed from beginning to end. In other words, the sap has been collected, boiled down, and we have the sugar. The results of long years of observation and study have been concentrated into definite concrete surgical facts.

Those of you who have had the pleasure of being in the sugar bush know that it takes barrel upon barrel of sap to make a relatively small amount of sugar. It has taken an infinite amount of labor and many observations to establish a few certain surgical facts, facts of inestimable value not only to the surgeon but also to the patient.

THE ADVANTAGES THE SURGEON HAS OVER
THE PATHOLOGIST

The surgeon, when he opens the abdomen, sees the exact relation of the diseased area to the surrounding tissue. On the other hand, when the pathologist receives the specimen this setting has often entirely disappeared.

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For example let us take a fallopian tube that has been converted into a hydrosalpinx, 3 centimeters in diameter, and that is adherent to the pelvic floor. While the tube is being loosened, its fimbriated end may rupture and the fluid escape. Such a tube when it reaches the pathologist may not be much larger than a normal tube and apart from a few adhesions the pathologist finds nothing wrong. How impossible it is for him to form an adequate idea of what was really found at the time of operation.

Again, let us take the specimen from a chronic appendicitis. The acute inflammation has subsided and at operation the appendix is normal in size but buried in adhesions. And yet, despite the fact that the patient has been relieved by an appendectomy, the pathologist may find little or nothing to indicate why it was necessary to remove the appendage.

Again, the manipulation during the operation may totally alter the form and relation of the structures removed. Let us take a case of pelvic inflammatory disease with dense adhesions. The operator sees the exact relation. If a bisection has been done and each half of the uterus has been removed separately and then the tubes and ovaries tied off on each side, the pathologist receives four pieces of tissue which are with difficulty replaced in their normal relation.

Those of you who have used the binocular microscope have noted how graphically the three dimensions are brought out. With two eye-pieces you focus down on the one object. Now let us suppose that the surgeon looks through one eye-piece, and the pathologist through the other, neither can possibly get the full value of the picture. Metaphorically speaking, if the surgeon wishes to get an adequate picture he must use both the eye-pieces—in plain English he must be not only a surgeon but also a good pathologist.

WHAT A KNOWLEDGE OF PATHOLOGY MEANS TO THE SURGEON

Frequently the surgeon on opening the abdomen is in a quandary as to what he should do next. He sees one or more suspicious areas and says to himself: "If I only knew exactly what these areas were I would go

ahead or back out." In such cases he usually closes the abdomen without doing anything. On the other hand, the surgeon who is a good pathologist has on previous occasions been in just such a dilemma but from frozen sections of the tissue has been able to determine the exact condition, and has either operated or desisted as the case might be. After a few such experiences he is often able to determine with relative certainty the actual condition from visual inspection, while in the doubtful cases he may again resort to the frozen section.

A thorough knowledge of the histological appearances of uterine scrapings is of great importance to the surgeon. Where a suspicious appearance of the cervix exists he cuts a piece out, has it examined at once, and if malignancy exists does a complete hysterectomy. If he be not a pathologist and has no expert at hand it may take days or weeks before he can know exactly what he is dealing with, so that valuable time is lost, and the patient suffers prolonged anxiety and added expense. Incidentally, it may be said, the specimen is sometimes lost in the mails.

When malignancy is suspected in the body of the uterus, curettings are obtained, the diagnosis is usually made in a few minutes, and the appropriate procedure carried out. In no other surgical field does a close co-operation between the pathologist and surgeon bring about such brilliant results as in the examination of uterine scrapings.

The surgeon's knowledge of the histological architecture of the pathological condition he is dealing with is often of great practical import. For example, on opening the abdomen he finds a very large multilocular ovarian cyst. On inspection he notes that it conforms in every particular to the common multilocular cystadenoma. He knows that this is benign, and accordingly can with impunity tap it and remove it through a relatively small incision, feeling certain that if a few drops of the fluid should escape into the abdomen it will do no harm.

On the other hand, if the cyst walls are very thin and the cysts few in number he will think of colloid carcinoma and will accordingly make a long incision and remove the tumor

intact, because if some of the cyst's contents escape, secondary implantation may take place on the peritoneum.

Again, when he is dealing with a large multilocular adenocystoma densely adherent to many loops of small bowel in the pelvis and also inseparably adherent to the pelvic wall he will remember that the outer walls of the cyst are composed of laminated connective tissue and that they contain no epithelial elements. Recognizing this important fact he will make his incision very superficially through the outer cyst wall in the pelvic region, and will shell the main tumor out. In this way he will leave a thin shell of connective tissue in the pelvis which is relatively innocuous and will convert a most difficult or impossible operation into a relatively easy one.

The trained surgical pathologist is always on the lookout for new conditions or for links in a process that is as yet not thoroughly understood.

A few weeks ago I did a supravaginal hysterectomy for a multinodular myomatous uterus. Myomata are so common that most of us at times tire of removing them. In the cul-de-sac, however, in this case, I found a lobulated pedunculated nodule, approximately 11 centimeters in diameter, and densely adherent to the sigmoid. As it was shelled out I noticed bluish cysts beneath its surface, and also a rusty area about 1 by 2 centimeters in diameter. In brief, the tumor was a pedunculated, subperitoneal adenomyoma. In over 25 years I have never seen such a specimen, and it demonstrated very clearly how these tumors may in time form immobile and irremovable adenomyomatous growths in the pelvis. Such a tumor means infinitely more to the surgeon than any remuneration he might receive for his services, and he would gladly travel far to obtain so invaluable a specimen.

On November 17, 1920, I operated on a young woman, 24 years of age, for a chronic appendicitis. She had asked me to be sure and examine the right ovary as she thought there was something wrong with it. I drew the ovary out through the gridiron appendix incision and found that it was about half as large again as normal. Seeing a few rather

large follicles I punctured them thinking that the increase in size of the organ was due merely to these simple cysts. A fine straight intestinal needle was used. The first cyst yielded a few drops of clear colorless fluid. The second and third contained similar fluid. The ovary, however, being still a little too large, I passed the needle deep into its substance where no cyst was apparent, and immediately there escaped probably a fourth of a drop of an oily fluid. This would doubtless have been overlooked had it not been for the whiteness of the surface of the ovary, and the excellent electric illumination which fell on it at an angle. The oily fluid, although very scant, gave a shimmering effect, which at once told me that we had to deal with a dermoid cyst. An elliptical incision was made over the surface of the ovary and a dermoid cyst, 3.5 centimeters in diameter, was at once encountered. It was shelled out intact and about two-thirds of the ovary left. Had it not been for the systematic puncture, the excellent illumination, and the immediate recognition of the oily fluid as indicative of a dermoid cyst, it would have been overlooked, and the patient would have in all probability been compelled to return for another abdominal operation in from 6 months to a year.

A thorough knowledge of surgical pathology is of inestimable value to the surgeon. Even when alone, he always has the advice of a competent pathologist—if he has had a thorough "binocular" training.

HOW SHALL WE OVERCOME OUR WEAK SPOT—
OUR LACK OF PATHOLOGY?

Very easily. Let each surgeon have associated with him a good pathologist. Just so. But in the first place at present there are not enough pathologists to man adequately our existing medical schools. In the second place the trained pathologist is too valuable a man to spend his time around the operating room for half of the day in order to help out the diagnosis in three or four cases; he would lose too much time. In the third place, many small clinics cannot afford to pay a real pathologist.

It is clearly evident then that many years would elapse before all operative clinics

would be able to profit by the services of a pathologist.

But suppose we send our pathological material to a distant laboratory. This has definite drawbacks. In the first place the surgeon cannot command the advice at the operating table which is so often necessary. Again, there is frequently much delay in packing and forwarding the material to the laboratory and not infrequently specimens are lost. Lastly, the fact that the surgeon in some cases must wait days or weeks for the pathological report not only adds greatly to the patient's hospital expenses but what is even more important it has a bad effect on the surgical assistants. When the case is fresh in their minds they grasp it as a definite clinical entity, but when days and weeks pass before the report is given, they may miss the laboratory diagnosis, or if they do learn it, it does not make the same indelible impression upon them.

No well regulated business house would be satisfied with such a cumbersome and slow method and the long period of suspense will often create an unfavorable impression on the patient. This method of procedure, although valuable, is only a make-shift—we must do better.

Scattered throughout the country are a few laboratories where surgical pathology is systematically taught and where graduates in medicine can obtain a thorough knowledge of the surgical pathology of the branch in which they are specializing. Every surgeon looking around for a wide-awake assistant should insist that the applicant have at least one year's training in the surgical pathology of his special branch. The earnest young man will immediately appreciate its value and will at once place himself under the tutelage of a good surgical pathologist for a year at least. At the end of that time he will be invaluable to the surgeon and will in most instances be able to advise the operator during the operation as to the exact condition present, and whenever a frozen section is necessary, a technician can at once make the required section and the assistant render an intelligent opinion then and there. This clearing up of the diagnosis will not only enable the operator to do more intelligent work but will also be of great value

to the patient. The assistant will likewise supervise the examination of all pathological material coming from the operating room. This will still further add to his knowledge of surgical pathology.

In 1891 I applied to Dr. Howard A. Kelly asking if I might enter his department as an interne. He said: "Yes, I will take you, but you must first spend several months with Dr. Welch and Dr. Councilman studying in pathology and bacteriology."

In due time the assistant becomes a full-fledged surgeon himself and having realized to the full the value of a fundamental knowledge of surgical pathology will insist that all those coming to him for surgical training shall be well grounded in the pathology of surgical diseases. In this manner there is no reason why the surgeons of the next decade should not all have a comprehensive knowledge of their own particular branch.

THE TRAINING OF THE ASSISTANTS IN THE GYNECOLOGICAL DEPARTMENT OF THE JOHNS HOPKINS HOSPITAL

Each year four of the graduating class are assigned to the gynecological department. During the year these men have charge of the patients in the private and public wards, take all the histories, assist at operations in the morning and work in the gynecological and cystoscopic dispensaries in the afternoon.

At the end of the year, after a conference with the house staff and the visiting staff one of the four men is picked out for promotion. The other three obtain hospital appointments elsewhere or enter private practice.

The man who has been selected now drops out of the gynecological department for a year and becomes an assistant of Dr. William G. MacCallum, professor of pathology. During his interne year this man has obtained a very good idea of the difficulties encountered in the various abdominal and pelvic operations and consequently is better able to appreciate the opportunities afforded him in the pathological department. He is, however, no novice in this laboratory because in his undergraduate days he received his instruction here.

He is now permitted to make numerous autopsies and gains a clear idea of gross patho-

logical lesions. While making the autopsies he has the opportunity of dissecting out the ureters and of learning the relations of the pelvic structures. He is continually dissecting out the bile-ducts to see if they are patent and has ample opportunity to observe carefully the lymphatic ducts. He also gains a lasting knowledge of the relations of the abdominal organs and of the blood supply. After a year's opportunity in such work he can never again get lost in the abdomen (How many of us would gladly embrace such a year's training even now!). In addition to all this he gains an insight into the lesions in all parts of the body, and has the opportunity of studying the histological picture of the various lesions noted at autopsy. He likewise has the privilege of attending again the undergraduate classes in pathology and of participating in the invaluable pathological conferences that are held each week.

I cannot let this opportunity pass without publicly thanking Dr. MacCallum for the rare privilege he has accorded the junior men of the gynecological department. I personally am also under many obligations to him because as a result of the extra year's training in general pathology the incoming man will have a much wider grasp of gynecological pathology.

At the end of a year our assistant in pathology returns to the gynecological department, he examines and describes all material coming from the gynecological operating room, supervises the cutting and staining of sections, and gives a careful and detailed description of the histological findings. Ample time is afforded him to work on special gynecological problems and he is within easy distance of that mine of information, the Surgeon General's Library, where practically every book and every periodical that is worth reading can be obtained. He also has an opportunity to see all the interesting cases treated in the department.

During the following year he is first assistant, assists at operations, has general supervision of the wards, and when the resident is away is in charge.

During his final or fifth year he is the resident gynecologist and has full charge of

the department and in addition to assisting the visiting surgeons performs many major and minor operations himself.

The finished product is:

1. A man who has a good knowledge of general pathology;
2. One who has an intensive knowledge of gynecological pathology and is the author of several papers on this subject;
3. A man with a comprehensive knowledge of gynecological and abdominal diseases;
4. An expert gynecological and abdominal surgeon;
5. One who has formed the habit of looking at his cases from every standpoint.

A man with such a training will not only do justice to his patients but should also prove an admirable teacher. He is bound to add to the sum total of our knowledge of gynecology and abdominal surgery. Few men who have become real investigators will ever be satisfied to relinquish this fascinating field during their active period of surgical life.

In years past many general practitioners gradually drifted into surgery. This is rarely possible today, as an adequate apprenticeship now requires several years of intensive study.

Those of us who graduated 30 years ago could not be expected to know surgical pathology. The same applies to the man who has been in practice 20 years, but the man who has entered the surgical field during the last decade has not the same excuse. If he has sought diligently he could have found some excellent teachers of surgical pathology. An occasional one has embraced the opportunity, but "where are the nine?"

I have always been grateful to the late John Caven who came back from von Recklinghausen's laboratory in 1889 bubbling over with enthusiasm. It was he who pointed out to me in no uncertain terms the value of pathology. Later it was my good fortune to study under that indomitable teacher Johannes Orth, the successor of Virchow. But to William H. Welch I am under an everlasting debt. For over 20 years, whenever in doubt, I had the rare opportunity of his advice and counsel. He was never too busy to look at my specimens and to spend hours if necessary

in making their meaning clear to me; and when something new was discovered he was really more pleased than if he had found it out himself. No other man in America has ever done as much to foster the spirit of laboratory investigation or afforded more encouragement to his pupils than Dr. Welch.

If one wishes to build a small cottage the simplest kind of foundation is sufficient. If on the other hand, he desires to erect a mighty structure deep foundations are essential. Pathology is the foundation of a surgical career.

You and I have learned much from the publications of other surgeons. Are we going to be sponges, merely assimilating the labors of others, or are we going to do our share in adding to the sum total of human knowledge?

The publishing of surgical papers without including the necessary pathological reports

is like leaving out several chapters of an interesting novel. Those of you who have neglected the study of pathology should take it up at once. You will then learn the joy it brings. Often you will hardly be able to wait to see whether your diagnosis is correct or not. Day after day will unfold a new panorama and now and again you will have the delight of finding something brand new—something that has never been described before.

We are justly proud of the great strides American surgery has made. The technique in most of the surgical clinics is of a high order and the operative results excellent. Our College of Surgeons represents American Surgery. If America is to lead the world in surgery in the near future every member of this our surgical family must be thoroughly trained in the one thing still needful—surgical pathology.