and reading all the literature on this subject no man is competent to do débridement correctly. It must be seen; you must live it; you must live in the atmosphere of it. Our surgeons made mistakes in France not because they were incompetent, but because they were not given the opportunity to see these things and learn about them first hand.

DR. KELLOGG SPEED, Chicago: This is the time to get primary impressions. I do not like what Dr. Macrae said about Château Thierry and the surgeons—good, bad and indifferent—that were there. The articles I have written on war surgery were put out with considerable effort, with a great deal of pleasure, with hopes that men would use them and profit by them. I had had experience before we entered the war, and I was with one of the first units that touched France in 1917. I arrived in connection with the MacRae outfit, June 5, 1918. I knew about débridement. I had done hundreds of such operations. There were a few other men there who knew about débridement. There was in these organizations—not citing Colonel MacRae's as one—a lack of seasoned men such as there were to be had in France. There were scattered through the English forces and through the French, men who did know these things and who wanted an opportunity to go ahead and practice what they knew, but a large percentage of them never had a chance to do it and when they were sent over, as I was, they were put in entirely subsidiary places that did not count.

DR. DEAN D. LEWIS, Chicago: The strange thing about this subject is that patients with the devitalized muscles have the least shock. The shock cases are those of gunshot wound through the knees, the cases in which the legs are practically shot off. With all this theory of peptones in the production of shock, and I do not care how long this has been in circulation, certain clinical factors demonstrate that you can have all the contused muscle you want until gas gangrene develops and the patient does not suffer from shock. Another thing about débridement's not being known by American surgeons: They understood the principles of it. The only way you can learn to do it is to do it. If we ever have another war I hope the evacuation hospital is made the center for instruction for surgeons who are going to practice surgery. They should be there as observers and train younger men. You could not learn débridement in Fort Riley or Camp Greenleaf, but you can learn the principles, that is, a thorough knowledge of anatomy. If a man has a thorough knowledge of anatomy, with good sense and judgment, he will learn how to do débridement. The thing that impressed me in our American Expeditionary Force was that we have been developing physiologic surgeons. The war demanded that we have anatomic surgeons, but they were few.

New York Indians a Health Problem.—The April number of the *Monthly Bulletin* of the New York State Department of Health is entitled the "Indian Conference Number." It describes the health problems in connection with the Indian population of this state. The state health department has also issued a special bulletin on this subject. New York state has an Indian population of more than 5,000; these Indians come in close contact with a million or more white citizens in the neighborhood of the reservations. A bill has recently been signed by the governor providing for a state commission to confer with the Indian committees of the two houses of Congress in an effort to better the situation. The Indian has adopted the white man's way of living in houses, but does not pay the same attention to light, ventilation and other sanitary factors. Consequently he falls an easy victim to tuberculosis and is prone to acquire other communicable diseases and to spread them among his white neighbors. The department has recently made a sanitary survey of the Onondaga Reservation. The results show the need of teaching the Indian sanitation and personal hygiene. The survey will be extended to other reservations in the state as a preliminary step to the development of a comprehensive system of instruction in sanitation. At present the Indians are under the charge of the national government.

TRENDELENBURG ANESTHESIA IN SURGERY OF THE PELVIS*

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I am convinced that the Trendelenburg¹ method of anesthetizing plays an important rôle in the prevention of postoperative ileus and shock, and therefore believe it worthy of consideration by this section.

Fig. 1.—Patient's legs strapped to foot of table by a broad surcingle.

It is a well known fact that trauma to the small intestine is one of the direct causes of postoperative shock and ileus. An experienced surgeon can often predict just which patient is going to have a stormy convalescence by the amount of trauma the small intestine has, of necessity, been subjected to during the operation; for trauma to the small intestine differs very much in its harmful effects from trauma to the other intra-abdominal organs. Indeed, some of the

Fig. 2.—Anesthesia begun with patient in high Trendelenburg position.

most comfortable patients we see after operation are those who have had resections of the large intestine, or extensive operations on the stomach, and some of the sickest are those with the quiet distended abdomens, regurgitation, restlessness and fast pulse—symptoms hard to differentiate from a beginning peritonitis

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1. Guthrie, Donald: Factors of Safety in Abdominal Hysterectomy, *Am. J. Surg.* 33:49 (April) 1919.

or a mechanical obstruction of the bowels, and which are the result of extensive trauma to the small intestine by the use of packs, made necessary to get exposure of the operative field.

Briefly, the object of the method is to rid the pelvis of as much of the small intestine as possible before the abdomen is opened for an operation in the pelvis. It is best employed for ether anesthesia, although I have used it with a fair degree of success during gas-oxygen anesthesia. The anesthesia is started with the

Fig. 3.—Lifting abdominal wall to free pelvis of any coil of small intestine.

patient in the high Trendelenburg position. It is not necessary to have patients who object come into the operating room to be anesthetized, although with the proper kind of anesthetizers very few patients will object. If the anesthetic is given in an anesthetizing room, the patient is put on the table which is to be used

during the operation, and the anesthesia is started with the patient in the high Trendelenburg position. The method cannot be employed successfully except by a skilled anesthetist, one who is well trained in suggestion and who can quiet the most apprehensive patient and quickly allay her fears, for the objections to the method are that it may frighten the patient and that the position may be uncomfortable. It has been asked why it is not possible to begin the anesthesia in the dorsal position and change to the Trendelenburg position as the patient is getting under the anesthetic, or to wait until the patient is fully anesthetized and then change to the Trendelenburg position before making the incision. I have tried both these methods, and in my hands they do not work with the same success as the method I am advocating. To change the patient's position as she is getting under the influence of the anesthetic frightens her, I have found, and starts straining or coughing, either of which is fatal to the success of the method. To wait until the patient is fully anesthetized and then change her position does not give the diaphragm time enough to pull the intestine out of the pelvis.

The anesthetist, who has previously met the patient, accompanies her to the operating room, feeding her mind with well chosen suggestion. The patient steps on a stool and sits on the table, the foot part of which has been lowered. The legs are fastened to the foot of the table by a broad surcingle which is fitted snugly, but not made uncomfortably tight (Fig. 1). The patient then lies down on the table with her hands clasped and her arms folded across her chest. The arms are fastened by a gauze bandage, which is attached to the head of the table. The table is now lowered in the high Trendelenburg position and the anesthesia begun (Fig. 2). Absolute quiet is maintained in the operating room while the anesthetic is

given. The patient's attention is left entirely with the anesthetist.

If the anesthetic has been given successfully and the patient has not strained or coughed while going to sleep, it is usual to find only a coil or two of small intestine in the pelvis, provided, of course, the intestine is not adherent to the pelvic structures. Through a small opening in the peritoneum, two fingers of the right hand are inserted into the cavity, and the abdominal walls are well lifted up (Fig. 3). The intruding air will cause any coils of intestine which have not gravitated out of the pelvis to slide upward, so that it is usually necessary to employ only one small gauze square to get excellent exposure (Fig. 4).

In comparing this method with the one usually employed, that of anesthetizing the patient in the dorsal position, making the incision and then calling for the Trendelenburg position (Fig. 5), it is amazing to see the difference in the amount of gauze packing necessary to use to obtain exposure (Fig. 6).

ABSTRACT OF DISCUSSION

DR. JOHN OSBORN POLAK, New York: It is a privilege to endorse what Dr. Guthrie said of the advantages of etherization in the extreme Trendelenburg posture as suggested by him. Those of us who have seen the foreign operators have been impressed with the facility with which they operate on the pelvic organs. The two points which make operation on the pelvic organs easy are, first, proper exposure of the pelvis by posture and, second, sufficient exposure of the field by a

Fig. 4.—Exposure of pelvis, only one small square of gauze being necessary.

large incision. Whether these pads be the gauze roll, or whether they be individual pads, or whether they be protected with gutta-percha tissue as suggested by some, they all produce trauma. If any of you have taken the trouble to investigate the experimental use of gauze on the peritoneum of animals you will know this to be true. What Dr. Guthrie said is absolutely true, that the postoperative convalescence is dependent on the amount of trauma done to the small intestine. The usual transfer of the patient from the anesthetizing carriage to the operating table is not only an unnecessary waste of ether, for it disturbs the patient who is awakened

from her light anesthesia and we have greater difficulty in securing sufficient relaxation. Consequently the operating table should be mounted with large wheels so that the patient may be anesthetized in this position on the table for pelvic operations. There is one criticism that I would make; I do not know that I have any ground for it. Instead of flexing the legs on the thigh and maintaining the patient in position by fastening the legs to the table which we feel causes tension of the rectus muscles and require deeper anesthesia, we have been having the legs extended and the weight of the body supported by the shoulders which are held in place by well padded shoulder pieces. When the patient is in this Trendelenburg posture I do not believe this posture can be used from the beginning as satisfactorily with the combination gas oxygen as with ether. The nitrous oxid-oxygen men tell us that they have educated the surgeon to operate with tense muscles. We feel that in operating we can get the needed amount of relaxation with minimum anesthesia if the patient is not disturbed during the induction of the anesthesia and this posture is used from the beginning of the anesthesia.

DR. ALBERT J. OCHSNER, Chicago: As to the time at which the foot of the bed is to be elevated, I would say that it does not matter so much so long as the table is elevated several minutes before the operation is begun. Bell of Montreal directed attention to the fact that when he anesthetized patients in the moderate Trendelenburg posture they did not inspire any mucus, and consequently at that time when most surgeons had many cases of ether pneumonia he had none. Of course, the inspiration of mucus does not begin until the patient is fairly well anesthetized because the patient protects herself before that time by swallowing the mucus, so that this feature will be equally well taken care

Fig. 5.—Compare difference in amount of small intestine in pelvis when patient is anesthetized in the dorsal position.

of if the patient is completely anesthetized in the horizontal position, and then before the ultimate preparations are made for the operation the foot of the bed is elevated, but you can tell the difference every time in the position of the intestines in patients remaining in the horizontal position until the abdomen is opened. For twenty years I have invariably directed that the foot of the bed be elevated

when the operating table is wheeled into the operating room. We have an anesthetizing room and then wheel the patient into the operating room and then the foot of the bed is immediately elevated. I am absolutely sure that Dr. Guthrie's plan is of tremendous value.

Fig. 6.—Trendelenburg anesthesia: coils of small intestine gravitated out of pelvis when patient is anesthetized in this position.

DR. DONALD C. BALFOUR, Rochester, Minn.: Dr. Guthrie had brought out a point in operative procedure that can well be kept in mind at all times. We follow out practically the same practice. We make the time a little later in which the patient is put in the Trendelenburg position, that is, as soon as the patient is unconscious of what is going on. In the majority of cases there is then sufficient time for the pelvis to be practically clear of small intestine. In my own observation much trauma is occasionally caused because of the impatience of the surgeon. Instead of being willing to wait until the patient is well relaxed and the intestines can easily be blocked off from the pelvis by gauze, their impatience is so great that while the patient is straining they try to force the intestines into the abdominal cavity rather than waiting for good relaxation.

DR. DONALD GUTHRIE, Sayre, Pa.: I would like to emphasize two points. First, the method of lifting the abdominal walls up after the peritoneum is opened. Any coils of intestine that have not gravitated out of the pelvis during the anesthesia can, as a rule, be made to slide upward. Second, I believe that we can get better results in fully anesthetizing patients in the Trendelenburg posture rather than to anesthetize them in the dorsal position and then change to the Trendelenburg position before the abdomen is opened, as mentioned by Dr. Balfour. This method cannot be employed successfully except by a skilled anesthetist, who is well trained in suggestion.

Entomology and Disease.—An outstanding feature of the louse and bedbug studies is the fact that these insects do not spread disease by biting but by being scratched into the flesh or having their feces scratched into the flesh. The importance of these studies must not be minimized for quite possibly we have here a probable explanation of the means of ingress for a number of other diseases which have baffled investigators.—W. D. Pierce, *J. Econ. Ent.* 12:43, 1919.