the proximal end—following Wyeth's suggestion—and after simple lateral suture of the vein purposely done, so as not to interrupt the venous current, complete arterial ischemia followed, causing an extensive dry sphacelation of the several fingers, part of the hand, and forearm. That this was due to complete interference with the arterial and not the venous supply of the limb is proven by the character of the gangrene—dry—and pallor of the skin. This result is important because the ligation was performed with the most aseptic technique and with absorbable kangaroo ligatures, and the wound healed *per primam*. The complete ischemia of the arm can only be accounted for by the torsion which was applied to the proximal end before ligation, which no doubt interfered with the collateral supply from the branches of the thyroid axis, superior intercostal, and possibly the internal mammary. This extra precaution, which was calculated to diminish the risk of secondary hemorrhage, should be avoided, if possible, in future operations.

We have already referred to the tropho-paralytic phenomena which in some cases permanently impaired the usefulness of the arm as a result of circulatory disturbances independently of injury to the brachial plexus—Veiel's case is probably the most notable in this respect. That the danger of sloughing is greater in double—arterio-venous—injuries than after interference with arterial circulation alone is well shown by the comparative statistics of the two classes of injuries. Le Fort, in his learned and careful study of 223 ligations of the subclavian artery for all causes (published in 1867), was able to find only 4 cases in which gangrene occurred, and this was limited chiefly to the fingers—1.7 per cent. These are the cases reported by O'Reilly, White, Blizzard, Terrier, the last complicated by injury to the brachial plexus. Von Bergmann, in 1877, in studying the effects of injury to the subclavian from the same point of view, states that in 90 cases of ligation of the subclavian, gangrene of the fingers occurred in 3 cases—3.3 per cent.—and in these this result was attributable largely to the extensive contusion of the skeleton and soft parts about the shoulder girdle. In this respect the risk of gangrene can not compare with the greater frequency of this result in similar ligations of the vessels at the groin.

It is also well established that gangrene is much less frequent after ligations of the third division of the subclavian above the clavicle than after the ligation of the axillary when this is done in the wound.

For instance, Le Fort (*loc. cit.*), in a study of 42 cases of axillary aneurysms, notes 5 cases in which gangrene occurred as a direct result of the traumatism without ligation, and in 6 in which the gangrene followed the ligation applied in the wound at the time of injury.

The gravity of the double—arterio-venous—injuries of the subclavian vessels from this point of view will now be appreciated, when we recall the facts gathered from our statistics that 1 in 11 unoperated cases sloughed—9.1 per cent.—and that in 1 of the 4 operated cases this unfortunate result followed—25 per cent.

The extent of the traumatism in the operated cases was, it must be remembered, greater than in the non-operated, since the operation in 3 of the 4 was necessitated by secondary hemorrhage or other grave complicating lesion, whereas secondary hemorrhage occurred in only 1 of the 11 unoperated cases.

To summarize the liability to gangrene of the limb, grossly stated and without reference to special modifying

conditions, it would be as follows for the various lesions: Arterio-venous injuries of both the subclavian artery and vein, including ligations, 13.5 per cent.; after ligation of subclavian artery—third division—1.7 per cent. (Le Fort); or 3 1/3 per cent. (von Bergmann); after obliterative injuries of the axillary, 26.8 per cent. This last percentage relates, however, to cases reported before 1867, and would no doubt be much improved by later statistics; the contrast between the axillary and subclavian injuries is, nevertheless, significant.

(To be continued.)

REPORT OF A DEATH FROM CHLOROFORM ANESTHESIA,

BEING THE FIRST IN A PRACTICE OF SIXTEEN YEARS, AND INCLUDING NOT LESS THAN TWO THOUSAND CHLOROFORM ANESTHESIAS.

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It is my unpleasant duty to report the first death from chloroform in my practice, not a very large one to be sure, which began in the Cook County Hospital in 1885. I have not kept a record of the number of anesthetics given for me, but they have certainly not been less than two hundred a year. Chloroform has been uniformly used. Only when a patient insisted on ether has anything but chloroform been given.

It has been my practice to have a skilful person administer the chloroform, even if it necessitated an untried and even inexperienced physician as my first assistant. My anesthetizers have been trained by me to give chloroform on two thicknesses of cheesecloth held over the left index finger or spread on a wire mask. It is administered drop by drop from an ounce bottle with a little notch cut out of the side of the cork. The anesthetizing room is still. The patient is directed to count after the anesthetizer at each full inspiration. Thus confidence and regular breathing and possibly a sort of hypnotic state is secured. This method has been once fully described by Dr. D. H. Galloway.¹ There is rarely any difficulty and almost never any kicking or rolling about on the table. Very rarely has artificial respiration been necessary.

In the case which I am about to report, the anesthetic was given by a physician with whom I had no previous experience and in a hospital where I have not been accustomed to operate. There was no oxygen at hand. My attention was given entirely to the operation. I had no reason to anticipate trouble.

Mrs. McC. was brought to my office for examination on September 28 by Dr. W. M. Watermann. She had all the appearances, on walking into the consultation room, of being 38 years of age and about four and a half months pregnant. I made an examination of her without getting her history. She was medium-sized, well built. The temperature was normal and the pulse 88. She showed evidence of previous pregnancies. The breasts were flabby; there was no marked pigmentation, no blue veins over the breasts. The vagina showed no enlarged veins. The cervix uteri was small, in the median line, hard and high up. It pointed slightly toward the right. The cervix did not seem to move with the abdominal tumor. The tumor had the size, shape and consistency of a pregnant uterus of four and a half

1. JOURNAL A. M. A., May 14, 1898.

or five months. There was one point which seemed to suggest a fetal extremity. This was very absorbing and riveted our attention. No heart sounds could be heard; no distinct placental souffle; no fetal movements felt. The tumor was fixed in the pelvis, did not rotate, and when standing, sitting or reclining had all the appearances of pregnancy.

The patient gave a history of repeated attacks of appendicitis. She insisted that she was not pregnant. She had borne two children, the youngest 2 years old. Five months ago, after a light attack of appendicitis, she noticed a slow, progressive growth of the abdomen. She had menstruated regularly since the last child was born in spite of nursing her. She had none of the subjective symptoms of pregnancy during the time the abdomen was enlarging, which symptoms were very pronounced in her previous pregnancies. Two weeks before she saw me she had an attack of abdominal pain. It was not like her previous attacks of appendicitis, but was deep, long, lasting and accompanied by faintness.

The diagnosis did not seem to us very clear. In spite of the absence of mammary and vaginal signs of pregnancy and the small, hard cervix uteri, and in spite of the absence of all subjective symptoms and the history of continuous menstruation, great importance was given the regular and timely growth of a tumor which was shaped like a uterus and had a feeling like that of an included fetus. It seemed that so regular and timely a tumor must be pregnancy. With the abnormal findings at the cervix we thought of extra-uterine pregnancy. The patient was warned of the possibility of some other form of tumor and urged to have constant medical supervision and a subsequent examination.

On the afternoon of Wednesday, October 2, Dr. Meany, who had the care of the case in the absence of Dr. Watermann, called me up on the telephone and told me our patient had been having more pain, the attacks being very severe. They were still unlike the attacks of appendicitis. She required morphin on Saturday and Monday nights. Her pulse had gone up suddenly to 108, and her temperature was 100.4. She was very sick. I decided to see her at once with Dr. Meany.

At 4 p. m. I was at her home. She was lying on her left side and appeared very sick and pale. She had been vomiting bilious matter for some hours. Her pulse was 120. The abdominal tumor was as large as that of a pregnancy at full term. It was, however, soft and cyst-like. The cervix was still small and hard and the fundus could not be reached. The breasts did not look like those of a pregnant woman. The vagina had no blue veins or other evidence of pregnancy. No fetal heart-beat could be heard.

With presumptive diagnosis of, 1, extra-uterine pregnancy and hemorrhage; 2, tumor arising from the pelvis with twisted pedicle, or 3, pregnancy with some complicating intra-uterine hemorrhage, an operation was proposed and undertaken at the Garfield Park Sanitarium, Dr. J. J. Meany, Dr. Rudolf F. Teschan and Dr. H. J. Stewart assisting. Several other physicians and students were present.

The patient was anesthetized with chloroform in her room and brought to the operating room. She was well scrubbed. She was not profoundly under chloroform during these preparations. The chloroform was pushed and the operation begun. Through a rather large (3-inch) median incision the abdomen was opened. The smooth, black surface of a multicular cyst of the left ovary presented itself. There were no adhesions to be felt.

The trocar quickly emptied the cysts and the tumor was removed. The pedicle was found twisted three times around. It was ligated in two places. The appendix was found very much enlarged, 4 inches long and quite angry looking. It was removed. At no time during the operation was there any anxiety about the patient. No stimulants were used and there was no delay from imperfect anesthesia. The operation had taken less than twenty minutes. On account of the small amount of fluid in the peritoneal cavity, and on account of the slight contamination of the wound edges with the cyst contents, the abdomen was now washed out with warm normal salt solution. This much revived the patient and she resisted and threw her body and legs about. This led the anesthetizer to administer more chloroform and she became quiet again. Suddenly it was noticed that she had stopped breathing. I left the care of the abdomen to an assistant and immediately opened the mouth, drew out the tongue and compressed the root of the tongue forward. The assistants elevated the foot of the table and Dr. Stewart very skilfully performed artificial respiration. This resuscitation was very tardily begun; the heart was beating and the blood became aerated. After washing up and putting on the gloves I closed the abdomen. Artificial respiration was continued. There seemed to be occasional efforts at automatic respirations, but it was necessary to keep up the mechanical breathing. Dressings were applied and the patient removed to her room, placed crosswise of the bed on a stretcher and artificial respiration kept up. Although in better position for this procedure it became less and less effective. She became cyanotic, the heart stopped and she died more than an hour after the first recognition of danger. There was no postmortem.

In considering this case there is only one thing which gives me any comfort. The anesthetizer was a stranger to me and untried. We had never worked together before. The patient had taken the anesthetic well and the operation had been without the slightest incident. The use of the hot normal salt aroused the patient; the anesthetizer gave more chloroform and the patient stopped breathing. For an unknown period no efforts were made to open the pharynx and produce artificial respiration. Some valuable time was lost. The heart continued to beat for three-quarters of an hour after all automatic respiration was suspended. The aeration of the blood was for a long time quite perfect, as shown by the red lips and disappearance of all signs of cyanosis. There is no evidence that the patient died of thrombosis, enzyme poisoning or any other effect of the simple and rapid operation.

When a patient dies of chloroform it is always recognized and properly credited. It seems in every case I have known to have been due to unskilful administration or improper surroundings. When a patient dies of ether narcosis it may be on the table, but it is usually after several days, and it therefore lacks the tragic element so confounding and even terrifying in deaths from chloroform. Too little care and attention is given the anesthetic. A person who gives ether is unfitted to give chloroform. I have extravagantly suggested that when a physician has once given ether he should be tattooed on the hand and never allowed to give chloroform afterward.

Il Lavoro.—Professor Devoto, of Pavia, Italy, has undertaken the publication of a periodical with this title. It is to be devoted to all questions of a medical and hygienic nature related to the professions and trades, manufactures, etc.