

GUNSHOT WOUNDS OF THE ABDOMEN IN PREGNANT WOMEN.

BY

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ON October 21, 1915, Mrs. A. K., aged twenty-five, the mother of one child, being pregnant at full term, was accidentally shot in the back by her husband. The bullet entered about an inch below the twelfth rib, on the right side, at the outer edge of the quadratus lumborum and could be felt lying under the skin of the abdomen about 2 inches above and 2 inches to the right of the umbilicus. The patient, on admission, was rather poorly nourished, but the heart and lungs were normal and the urine free from albumin. She seemed to be in much pain, was greatly frightened, but not in severe shock. P. 100, T. 99.4°, Res. 26 and entirely thoracic. The abdomen was tense and hard, very sensitive and slightly distended. A small amount of blood was escaping from the wound in the back. The child's heart was strong and nearly normal in rate.

The woman's condition demanded immediate exploration of the abdomen. This was done within less than three hours after the accident. The peritoneal cavity contained a large amount of free blood and coagula. Amniotic fluid was found mixed with blood free in the abdomen. A perforation could be felt on the posterior wall of the uterus, somewhat to the right of the midline and about 3 inches below the fundus. A second perforation was present on the anterior wall of the uterus a little nearer the midline than the posterior wound, and about 2 inches below the fundus. The course of the bullet between the two openings was about 5 inches. It was found impossible to properly explore the abdomen for intestinal perforations on account of the presence of the full-term uterus. Cesarean section was, therefore, immediately done. The incision in the uterus was immediately over the placenta, located anteriorly and in the upper part of the uterus. The placenta had been perforated by the bullet. The child was delivered readily and began to breathe immediately. It was uninjured except that the ring finger on the left hand had been broken and lacerated by the bullet. The uterus contracted normally. The uterine incision and the two bullet wounds were closed with chromic catgut.

The excess of blood was sponged out of the abdomen, and the entire intestinal tract examined for perforations. It was found that the bullet had entered between the folds of the mesentery of the ascending colon and passed through the gut making two perforations. It had then gone through the uterus and into the abdominal wall without injuring the small intestines or any other organs.

The escape of the small intestines was due to the fact that the uterus, as is usual, lay more to the right side of the abdomen and the small intestines to the left, and also to the fact that the bullet passed through the right side of the uterus.

The perforations in the colon had leaked very little. They were closed in the usual way. The posterior opening, which was in a part of the gut not covered by peritoneum, was closed as well as possible, and a drain passed down to it. There was no leakage from the bowel after the operation. The abdomen was drained by inserting three soft rubber tubes; one to the bottom of the culdesac, another to the outside of the ascending colon, where there had been some soiling, and a third at the point of perforation. The mother left the operating-table with a pulse of 100 and made an uninterrupted recovery. There was some drainage of pus with a colon bacillus odor, but no drainage from the intestine. The highest pulse rate after the operation was 120. The highest temperature 101° F. Patient was in the hospital thirty-five days and left with the wound entirely healed. She was able to nurse her baby. The child was a strong hearty infant and has developed nicely. The broken, lacerated finger was pieced together and healed, *per primam intentionem*, slightly deformed.

A gunshot wound in the abdomen of a pregnant woman differs somewhat from one in the abdomen of a woman who is not pregnant. The dangers of hemorrhage and of infection from a perforated intestine exist in each; but the pregnant woman, on account of her condition, runs a greater risk. The danger of a bullet causing serious hemorrhage in the abdomen is greater during pregnancy, and this danger increases as gestation advances.

Infection in the abdomen of a woman is more serious during pregnancy than at any other time. This fact is well borne out by the high mortality from ruptured appendices among pregnant women.

The management of a gunshot wound in the abdomen of a pregnant woman differs chiefly in the problems which arise from the presence in the abdomen of the enlarged uterus or from the injuries this organ may receive. The question at once arises whether the uterus shall be emptied or not, and whether it shall be done by Cesarean section, with or without hysterectomy.

It is a well-settled principle in civil practice, where conditions permit that, when a bullet perforates an abdomen, an exploratory

laparotomy shall be done without delay. This rule applies with even greater force in the case of pregnant women because there is the added danger of injury to the enlarged uterus along with the inherent risks which accompany the pregnant condition.

In this connection it is interesting to note that in not a few of the cases reported in the literature, in which pregnant women were shot through the abdomen, recovery took place without operation. Moreover, in quite a number of the cases in which the abdomen was opened, no intestinal perforations were found. In these cases the pregnancy was usually well advanced, so that the intestines were pushed up out of the lower abdomen. The wounds themselves were, as a rule, well below the umbilicus.

In the care of perforating wounds of the abdomen in pregnant women the question of emptying the uterus arises immediately. All will depend upon the general condition of the patient, whether the uterus is injured or not, and whether the pregnancy is in an early one or near term.

It is worthy of note that, in the cases found in the literature, in which the uterus was perforated or severely injured, the organ promptly emptied itself in the majority of cases. If the pregnancy is at term, even with the uterus uninjured, it is necessary to do a Cesarean section because it is very difficult to properly explore an abdomen if it contains a full term pregnancy. Moreover, as the child is fully developed it is to its best interest that it be delivered, at once. Another reason why the uterus, at or near term, should be emptied in the case of a bullet wound of the abdomen is, that if a perforation of the intestine is present, peritonitis may develop, the risk from which will be greatly increased if labor sets in within two or three days after the operation and before the infection is securely walled off.

In treating peritonitis we endeavor not only to keep the patient quiet, but even prevent peristalsis so that adhesions may form and localize the infection. It is easily apparent that a violently contracting and finally collapsing uterus would be very likely to break up adhesions and spread an infection which might otherwise become localized. In the presence of an actually existing peritonitis, or in an abdomen badly soiled with feces, one might not open an uninjured uterus and expose its well known avenues of infection to contamination unless it were done chiefly in the interests of the child.

In pregnant women with gunshot wounds of the abdomen the gestation has not always advanced to a point when the child is viable. The uterus, too, may not be large enough to greatly impede

an exploration of the abdomen. In such cases the emptying of the uterus will depend upon whether the organ has been seriously damaged or not. If the uterus is uninjured or only superficially wounded, it may be left alone. If, on the other hand, the uterus is shot through, it will probably be safer for the mother if the gestation is terminated at once. It is worthy of note that in the cases reported in which the uterus was shot through, the child was usually killed by the bullet and abortion followed quickly.

In an early pregnancy it will make less difference whether an injured uterus is emptied or not because if it aborts it will cause less commotion and be less likely to spread infection. Moreover in such cases, if there is no injury to the intestines, one may be more conservative with an injured uterus, because infection is less likely to develop.

The method of emptying the uterus will depend upon the duration of pregnancy. As the abdomen is already open Cesarean section will naturally be used if the child has reached any considerable size. In the earlier stages the pregnant uterus, unless badly lacerated, should be left to take care of itself or emptied through the cervix. In certain cases, when the uterus is badly lacerated, or when for some reason it is infected, hysterectomy will be necessary. Hysterectomy in gunshot wounds of the uterus is rarely necessary. The patients are considerably shocked by the hemorrhage and fright. This shock will be augmented by the necessary inspection of all the abdominal organs, including the entire intestinal tract. The uterus is not necessarily infected and will take care of itself almost as well as the other abdominal organs. The woman herself will be more likely to combat the infection if her vitality is not lowered by too much surgical intervention.

Drainage will, of course, be used in all gunshot wounds of the abdomen in pregnant women. There will be considerable blood in the abdomen which cannot be removed during the operation, and this blood serves as a culture medium for infection which a dirty bullet or a perforated intestine may furnish. Moreover, in the rapid inspection of the intestinal tract, one cannot be certain that he has not overlooked a perforation. Good drainage will remove the blood more safely than it can be done by irrigation. Irrigation of the abdomen in cases of gunshot wounds will rarely be necessary. Occasionally, when there is extensive soiling of the peritoneal cavity by feces, and when the case is early and the patient's condition otherwise good, it may be considered.

CASE V.—Mrs. M., twenty-one years of age, and in the sixth month of pregnancy, was shot in the upper abdomen(8). The bullet passed through the liver, diaphragm, pleura and the left lung. The uterus was uninjured. After some sign of pneumonia she recovered without operation and six weeks later was delivered normally.

CASE VI.—Eva M., aged twenty, colored, in the sixth month of pregnancy, was shot in the abdomen at a point 4 inches to the right of the umbilicus(9). There was no shock, and pulse was 100. On opening the abdomen it was found filled with blood. There was a large wound in the fundus of the uterus just in front of the right tube. There was no wound of exit. The bleeding uterine wound was closed. There were no wounds of the intestines. The abdomen was washed out and drained. The patient aborted the next day and the fetus was found to have been killed by the bullet. The mother recovered.

CASE VII.—A woman, twenty-eight years old, pregnant at full term, was wounded in the abdomen at a point 2 inches above the right anterior superior spine of the ileum(10). The course of the bullet was downward and forward. There was no shock or other serious symptoms. In forty hours she was delivered of a dead child with the bullet in its abdomen. The mother recovered.

CASE VIII.—A bullet penetrated the abdomen and the walls of the uterus in a pregnant woman and killed the fetus(11). The mother recovered.

CASE IX.—A woman, pregnant at full term, was shot with a rifle in the lower abdomen(12). There was a severe hemorrhage followed by syncope. Labor followed immediately and patient was delivered without laparotomy. Both the mother and child lived.

CASE X.—A colored woman, eighteen years old, in the sixth month of pregnancy, was struck by a bullet $1\frac{1}{2}$ inches above the right anterior superior spine of the ilium(13). There was no wound of exit. Labor followed with delivery the next day. The bullet had passed through the child. Severe infection followed but the mother recovered. There was no operation.

CASE XI.—A woman, nine months pregnant, was shot in the abdomen. Amniotic fluid and blood escaped(14). She was delivered normally in eleven hours. The child had been struck by the bullet and lived only eight hours. The mother had symptoms of peritonitis, but recovered without operation.

CASE XII.—A woman, five months pregnant, was wounded by a bullet to the right and below the umbilicus(15). There were no serious symptoms. Laparotomy in six hours revealed a wound of the uterus 3 inches below the fundus with no wound of exit. The uterine wound was sutured and the abdomen closed without drainage. Two days later she was delivered of an uninjured five months' fetus. The mother recovered.

CASE XIII.—A woman, nineteen years old, four and one-half months pregnant, received a bullet wound in the abdomen 5 inches to the right of the umbilicus(16). There was severe shock. Laparotomy after five hours showed a large amount of blood and

4 inches to the right of the umbilicus(26). The wound healed uninterruptedly. She was delivered at term of a living child with intestines protruding through healed abdominal wound.

CASE XXIV.—A woman of nineteen years, in the eighth month of pregnancy, was wounded in the left abdomen midway between the anterior superior spine and the umbilicus(27). There was a second wound 4 inches above this. There were two wounds of exit. Laparotomy showed much blood, but no intestinal injuries. The fundus was perforated in two places. Cesarean section was done and the abdomen closed. Both the mother and child recovered. The child was injured only in the fingers.

CASE XXV.—Woman of twenty-three years, seven months pregnant, was shot in the abdomen $2\frac{1}{2}$ inches below the ensiform cartilage, and $\frac{1}{2}$ inch to the right of the midline(28). Pulse 120, temperature 100° , respiration 28. Serous fluid and gas were escaping from the wound. The abdomen was opened twenty-four hours after the accident and the stomach and jejunum found perforated. The abdomen contained pus, blood and stomach contents. There were many adhesions. The uterus was not injured. The abdomen was washed out and searched for further perforations. The perforations were then closed and the abdomen drained. The woman was delivered normally at full term.

CASE XXVI.—Henrot reports that a mother while on her way to the maternity hospital in Rheims had her abdomen torn open by a shell and died immediately(29). The child was uninjured and had only to be lifted out.

CASE XXVII.—Penetrating gunshot wound of gravid uterus(20). (Case Report.)

CASE XXVIII.—Mrs. F. F., an Italian woman, thirty-six years old, in the fourth month of pregnancy, received a load from a shot gun in the right lower quadrant of the abdomen(31). She was admitted in shock and with a distended abdomen. The wound was bleeding freely. Temp. 98° , pulse 63. At operation forty small perforations of the intestines were closed. The uterus showed a 4-inch laceration on its anterior wall, which was a tear, and not due to the shot. The fetus was free in the abdominal cavity, and the placenta was still in the uterus. The placenta was removed and the uterus closed as in Cesarean section. The abdominal cavity was irrigated and closed with drainage. The mother made a good recovery.

CASE XXIX.—A girl of sixteen years, at full term, shot herself in the abdomen(32). The bullet entered 7 inches to the right of the umbilicus and made its exit an inch to the left of the umbilicus. There was little shock, pulse 116, respiration 34. The umbilical cord protruded from the wound of exit. On opening the abdomen a full-term child was found free in the abdomen. It had been killed by the bullet. A powder burned diagonal wound, 4 inches long, was found in the uterus. The placenta, which was still in the uterus, was removed, and the uterus closed after the wound had been

trimmed. The abdomen was irrigated and closed with drainage. There was some infection, but the mother recovered.

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DISCUSSION.

DR. JOHN D. S. DAVIS, Birmingham, Alabama.—I do not like to let this paper go by without some discussion, I desire to report a case of gunshot injury in a woman pregnant three months and a half. She was handling a small rifle when it accidentally went off and

shot her through the abdomen, making twenty-one perforations, two through the mesenteric border of the transverse colon, and nineteen through the small intestine. She was brought by train eighty-five miles, and I saw her twelve hours after the reception of the injury. There were five perforations on the mesenteric border of the intestine, two perforations on the mesenteric border of the transverse colon. I turned back the serosa of transverse colon, turned in the musculature, and then closed the serosa over this. Instead of doing two resections, I took out 5 feet of the intestine including the nineteen perforations in the gut, and she recovered, and was delivered of a living child at the ninth month.