CLARENCE G. TOLAND, M. D. (1930 Wilshire Boulevard, Los Angeles).—The influence of thyrotoxin upon the psychic state of an individual is a subject of considerable interest and importance, particularly to the psychiatrist and to the surgeon.

Doctor Sanderson's and Doctor Smyth's interesting paper is a valuable contribution to the problem.

It is difficult to prove that toxins of thyroid origin can produce definite mental disturbances, such as the major psychoses, but we must admit this possibility when we consider the important rôle other toxins play in the etiology of the insanities.

It is true that exophthalmic goiter rarely occurs in the insane, but not infrequently cases of exophthalmic goiter are found *among* the insane. These have been wrongly diagnosed and are merely manifesting phases of the depressive or stimulative effects of the toxic thyroid. The man who removes these unfortunate individuals from their environment and by proper treatment effects a cure certainly performs a very great service. Would it not be advisable for all institutions for the insane to employ someone especially qualified in diseases of the thyroid to examine their patients at intervals and attempt to segregate these cases?

The adenomatous goiters are of more frequent occurrence and, when toxic, they undoubtedly aggravate a preëxisting psychosis. A subtotal thyroidectomy is indicated in the majority of this type, but there is a certain percentage who are better left alone. In our experience many of the cases were considerably benefited by an operation, but very few of them received a complete cure. They were able to work, perhaps, but they always seemed to remain mentally unstable. In two cases of dementia praecox no benefit was obtained. One case of true hallucinations and delusions, prior to thyroidectomy, became violent and required restraint for about three weeks after the operation. She was eventually benefited, but is still quite depressed.

Any insane patient with a toxic goiter should be given the benefit of a subtotal thyroidectomy, for he has little to lose and much to gain; but the results as a whole are not very stimulating to the surgeon accustomed to the marvelous results following similar operations upon sane individuals.

Among certain of the laity there is a belief that occasionally insanity will occur after the removal of a goiter, and not infrequently we are asked this question by the anxious relatives of our patients. This unquestionably is merely a superstition founded, possibly, upon the infrequent case of postoperative myxedema, for we have never known a goiter patient without insanity to form a true psychosis as a result of a subtotal thyroidectomy.

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DOCTOR SANDERSON (Closing).—I wish to extend my thanks to the doctors who have discussed our paper, and especially to Doctors Inman and Toland, whose kindly and thorough discussions of the subject are a real contribution. We do not claim to have accomplished anything spectacular in our treatment of this series of patients, but so little of a definite nature is known of these psychoses, and there is so much reason for suspecting a subtle underlying endocrine basis for at least some of them, that we thought that anything that might shed any light on their relation to the thyroid gland, the keystone of the endocrine arch, would be well worth while. While we had this underlying purpose in mind in presenting this series, in most of the individual cases there was an additional definite indication for operation, such as size, cosmetic considerations, actual obstructive phenomena, or toxicity.

INVERSION OF THE UTERUS*

REPORT OF CASES

By EDWARD N. EWER, M.D.
Oakland

DISCUSSION *by H. A. Stephenson, M.D., San Francisco; John C. Irwin, M.D., Los Angeles.*

TWO patients with puerperal inversion of the uterus came under observation in Highland Hospital during the year 1928. Both were treated by vaginal hysterectomy for reasons stated in the case reports which follow. According to the usual classification, one would be called chronic because the inversion was treated several weeks after its occurrence, and the other acute because the whole series of events took place within twenty-four hours. Both patients recovered.

REPORT OF CASES

CASE 1.—G. I., age 21, was admitted on the gynecologic service because of bleeding from an inverted uterus.

The bleeding had been continuous since the birth of her baby in another hospital four weeks previously. The pregnancy was normal and the delivery at term was spontaneous after a labor of eight hours.

She states there was difficulty in the removal of the placenta, it being accomplished in about fifteen minutes by vigorous fundal pressure with one hand, and manipulation in the vagina with the other. Excessive hemorrhage immediately followed. There was no pain then nor during the weeks following. She was given a blood transfusion twenty-four hours after delivery. She left the hospital in an ambulance after two weeks, and the inversion was discovered by her physician at an examination made later in her home. No attempt was made at that time to replace the uterus.

On entering Highland Hospital this patient's temperature was 99, pulse 130, and respiration 24. There was a slight systolic murmur heard at the apex. Blood examination showed: red blood cells, 1,430,000; hemoglobin, 30 per cent; white blood cells, 9150. There was a foul-smelling bloody vaginal discharge. Examination disclosed the completely inverted body of the uterus in the vagina with the cervix tightly contracted. The patient was in charge of Dr. Clarence Page, who attempted to reduce the inversion by taxis. This failing, he performed a Spinelli colpohysterotomy. It was found that the efforts to reduce by taxis had partially ruptured the softened anterior wall. After the incision of the cervix had been continued nearly to the fundus the uterus was easily replaced. However, in attempting to repair the incision the tissues were found to be so friable that it was impossible to place the stitches so that they would support the wound edges in coaptation. The uterus was therefore removed.

During the course of the operation 520 cubic centimeters of blood was given by direct transfusion. The temperature for six days following operation ranged between 99 and 102. The patient was discharged in good condition, other than the anemia, at the end of three weeks.

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CASE 2.—L. B., para 2, white, American, age 23, admitted July 20, 1928 in first stage of labor at term. Her first labor had lasted twenty-four hours, ending with forceps delivery. The puerperium was normal.

The present pregnancy was uneventful. The labor lasted five hours, resulting in delivery of a normal infant in L. O. A. mechanism. The cord was around

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the child's neck three times, necessitating clamping and cutting. This may have exerted a pull on the fundus and caused dimpling at the placental attachment, thus beginning the inversion. Several authors mention this as a probability in such cases. There was much hemorrhage at this stage. It was noted that the fundus rose slightly in twenty minutes. The attendant states that he thought this meant placental separation, so he then used pressure, without undue force, to expel the placenta. This was followed immediately by complete inversion. The placenta was adherent at the fundus. It was stripped off and the uterus easily pushed back into place. Hemorrhage, estimated at 2000 cubic centimeters, followed, and to control it the uterus was packed with gauze. The delivery took place at 8 p. m. The patient was given 1000 cubic centimeters of physiologic salt solution by hypodermoclysis. The uterine packing was removed at 10 p. m. and her pulse was recorded as 120. She was then given 500 cubic centimeters of 10 per cent glucose intravenously. The pulse at 11:15 p. m. was 98 and of good quality.

The next evening I was called to see the patient because of the presentation at the vulva of a dark red fluctuant mass. This proved to be a portion of the membranes the margins of which were still attached to the reinverted fundus of the uterus, imprisoning a few ounces of blood. The uterus was found to be again completely inverted, filling the vagina and tightly gripped by the cervix. Moderate taxis under ethylene failed to replace it. As its color was not good, and as infection was suspected, I decided to remove it. An incision was made in the vaginal wall of the anterior fornix, the lower line of the bladder was located with a sound through the urethra and it was pushed up out of the way. The anterior uterine wall was incised, as in the Spinelli procedure, and at this point the uterus could easily have been replaced had its condition warranted replacement. The broad ligaments were tied and the uterus, including cervix, was removed under clamps placed upon the vaginal wall close to the cervix. The vaginal opening was partly closed with chromic gut, leaving a strip of gauze for drainage. The highest postoperative temperature was 101, and on the seventeenth day the red cell count was 1,340,000, and hemoglobin 27 per cent. She was discharged in three weeks.

These cases are met with so infrequently in individual practice that we have to rely largely upon the examination of masses of case report data to gauge the value of treatment procedures.

Full reports are desirable. They should give the age and parity of the patient, and an expresssion of opinion as to the cause of the inversion and when and how it was discovered. The amount of blood lost, together with other allied symptoms such as shock and pain, with the measures taken to combat them, should be stated. The method of delivery of the placenta and its area of attachment is of importance. Finally the method of caring for the inversion itself should be described with the character of convalescence or cause of death.

RÉSUMÉ OF SERIES OF FIVE HUNDRED AND SIXTY CASES REPORTED IN LITERATURE

I have examined a series of reports more or less fully detailed in the articles of Thorn, Mason and Rucker, Evans and others, with the following results:

Total number of cases, 560.

Number of deaths, 80—14 per cent.

Hysterectomies—vaginal and abdominal—67; died, 9—13.2 per cent.

Anterior colpohysterotomies, 14; died, 0.

Posterior colpohysterotomies, 48; died, 2—4 per cent.

Manual repositions, 324; died, 60—18.5 per cent.

Manual reposition, then, as a method of treatment gives the highest percentage of deaths in this series. Most of these were done immediately and doubtless in the presence of shock. Furthermore, in nearly 30 per cent of the cases in which it was tried the attempts at manual reposition failed. So, with this high percentage of deaths and failures, some inquiry as to when and under what conditions manual reposition should be attempted seems advisable. In the eighty deaths in this series the reporters express definite opinions as to cause in only fifty-eight of them. Of these, twenty-one died of hemorrhage, twenty of shock, twelve of sepsis, two of pulmonary embolism, and three of anemia and heart failure. Shock may be present without hemorrhage, but the two are usually related and considered together. Their great importance is indicated by the fact that nearly three-quarters of the deaths are caused thereby. In spite of this most writers stress the advice to make immediate attempts to replace the uterus without considering the condition of the patient. This is apparently the impulse of most obstetricians when suddenly confronted with this startling emergency. It is well known that any surgical procedure undertaken during shock is dangerous. In case of inversion the replacement should, I believe, be delayed in favor of measures to stop the hemorrhage and improve the condition of the patient. This opinion is also expressed in the papers of Maxwell, Hoover, and Peterson.

IMMEDIATE TREATMENT

The hemorrhage should be treated by pressure with gauze pads wet with three per cent acetic acid solution packed about the uterus. A rubber tubing tourniquet may be used for short periods, but if left in place too long the result will be disastrous. Catgut sutures may be placed deeply in the lower segment to constrict the uterine arteries.

For shock, blood transfusion is indicated in most cases, but the emergency is acute and something is needed to bridge the time taken in finding a donor and making other necessary preparations. The most promising agent to meet this requirement is, I believe, the gum glucose solution so successfully used in shock and hemorrhage emergencies by Ward and Farrar in the Woman's Hospital in New York. Glucose solution alone does not seem to be sufficient. In general hospital practice there are so many emergencies in which time is lost in arranging for transfusions that this solution, kept on hand in 300 cubic centimeter containers ready for use, may mean the occasional saving of a life. Of course, physiologic salt solution hypodermoclysis should not be forgotten. The various heart stimulants often administered in haphazard fashion are of little use, for what the heart needs is not more forceful contractions but something to contract upon, and

when its venous supply is increased and the well-known symptoms of shock have been relieved, attempts may be made to replace the uterus.

Relaxation, according to many reports, is best secured by spinal anesthesia. If difficulty is encountered, the anterior colpohysterotomy of Spinelli is the simplest, easiest, quickest, and safest method of replacement. In the cases here quoted it was attended with no mortality. However, where infection is known or suspected the wound in the uterus may furnish the same good incubation place for organisms as does the cesarean wound. Hence it would seem best when frankly infected to remove the organ. Most authorities so advise in the infected cesarean case.

In regard to the prevention of inversions the suggestion of Jones is worthy of notice. He points out that in inversion there must of necessity be relaxation of the uterine musculature. He thinks a good rule to follow would be that no Crede manipulation or traction on the cord be practiced during the third stage unless the uterus is firmly contracted. He thinks this rule would prevent one-half of the inversions. Firm contractions can be secured by giving half an ampoule of pituitary extract immediately after the birth of the baby. The other half may be given after the placenta has been delivered. This is routine practice in Highland Hospital, but was neglected in the one case of inversion which occurred there. This method of using pituitary extract has the added advantage of leaving the uterus free of clots and thus almost eliminating after-pains.

CONCLUSIONS

See that the uterus is firmly contracted and the placenta separated before using pressure on fundus to expel the placenta. When inversion has occurred treat the patient for hemorrhage and shock before making attempts to replace the uterus. If manual reposition fails, do the Spinelli anterior vaginal hysterotomy under spinal anesthesia. Vaginal hysterectomy may be necessary if infection is present.

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DISCUSSION

H. A. Stephenson, M. D. (490 Post Street, San Francisco).—Doctor Ewer has given us a very complete paper on inversion of the uterus. This condition is quite rare and many physicians have not encountered the condition in their practices.

Two examples of this condition have come under my observation within the past two years and these constitute my entire experience. In each case there was complete inversion almost immediately following birth of the baby. Pressure was being made on the fundus in each case to expel the placenta, but no traction was made upon the cord and in one case the placenta remained entirely attached to the fundus of the uterus. Shock was severe in each case, but hemorrhage was not an alarming factor. Reposition was done after delivery of the placenta and the uterus packed. In the first case the patient lived about five hours; apparently died of shock. In the second case the patient made an uneventful recovery.

Polak has called our attention to our behavior during the third stage of labor and has emphasized a most important principle to be followed, namely, never to be in a hurry to express the placenta until we are certain that it has separated, except in the case where profuse hemorrhage is encountered. Bearing this in mind, we perhaps avoid two of the important causes of inversion: pressure on the fundus of the uterus or attempts to deliver the placenta manually. In those cases where the uterine wall is very thin and flabby, spontaneous inversion may occur.

The treatment of the condition has been well discussed by Doctor Ewer, and leaves no room for further suggestion.

John C. Irwin, M. D. (1709 West Eighth Street, Los Angeles).—Doctor Ewer's cases and discussion of treatment of this rare but dangerous accident of labor have been very interesting. Since each individual sees so few cases of this complication in a lifetime, even though doing obstetrics as a specialty, one cannot form an authoritative opinion from one's own experience. Authoritative opinions, therefore, can only be formed from a collection of cases seen by many observers, and treated by various methods, as Doctor Ewer has done in this paper.

I have seen two cases of recent inversion of the uterus at labor, one as a house surgeon at the New York Lying-in Hospital, which was immediately replaced and the patient recovered. The second case I observed at the Royal Infirmary, Edinburgh, Scotland, in August 1928. This patient had been delivered on July 31 in her home by difficult forceps extraction for persistent occipitoposterior position and the placenta twenty minutes later, probably by Crede. She complained of severe abdominal pain immediately after delivery of the placenta and had considerable bleeding and shock. The vagina was packed with gauze and the patient transported from the Highlands into Edinburgh, taking six hours for such transportation. On arrival the packing was removed and the patient again complained of severe abdominal pain. A saline douche was given and the pack reinserted. Severe agonizing pain was said to be the first and most prominent symptom, and a profuse lochia the next most prominent. This patient was operated upon August 6, 1928, by Doctors Davidson and Douglas Miller. Doctor Davidson did median laparotomy incision and then dilated the cervical ring manually from above while Doctor Miller made pressure on the fundus uteri through the vagina from below. Considerable force was required to dilate the cervix, as was also necessary to reduce the inversion from below. Doctor Miller said he was on the point of pushing a finger through the uterine wall. After reduction the uterine cavity was irrigated with eusol solution at 120 Fahrenheit, but not packed. Pituitrin was given. This patient recovered. She was, therefore, allowed to recover from her shock and to go for one week before an attempt was made to reduce her inversion. This is in keeping with Doctor Ewer's views and I believe is the proper method of treatment, under the conditions one generally sees these cases, since we usually see them in consultation some time after the accident has occurred. However, if one is present and already scrubbed, gowned and gloved, when the inversion occurs, I believe it would be wise to attempt to replace the inversion at once before the cervix can contract, and I believe immediate replacement would not be difficult or very shocking to the patient. Certainly replacement and packing would prevent much hemorrhage, which is no doubt one of the greatest causes of the profound shock from which these patients suffer.

Prevention is of course the best treatment, and the important point in prevention is not to hurry the third stage of labor by Crede or by early expression or by traction on the cord. Doctor Ewer has done us a service in reporting his cases and discussing the treatment so wisely and understandingly.