needs no emphasis. Unfortunately many of the procedures upon which the surgeon or physician must rely are not altogether reliable.

The removal of regional lymph glands as an aid to diagnosis in chronic arthritis of uncertain origin is a comparatively new procedure and the degree of accuracy is not well established. Most of the series of cases that have previously been published have been relatively small and the follow-up of short duration. Here we have been primarily concerned with three things: whether the right gland has been removed; whether the clinical course has borne out or contradicted the pathological findings; and, in an unselected series of apparently normal glands obtained from the living or at necropsy, the proportion showing tuberculous changes. So far as the first point is concerned there is not enough information available to give any reliable opinion, though it is obviously necessary to take both superficial and deep glands when the knee is involved. The one case of hip disease in which the iliac gland was negative and the obturator positive is worthy of note.

The accuracy of the procedure can be related only to the hip and the knee, as the numbers are too small in relation to the other joints. In the hip the clinical progress of the lesion in approximately one-third of the cases in which the biopsy was negative established a diagnosis of tuberculous disease, and in half of those in which biopsy was positive subsequent progress suggests that the lesion is not tuberculous. In relation to the knee-joint the findings are similar so far as the negative results are concerned, nearly one-third having been proved tuberculous; however, of the cases giving positive results one alone has progressed in such a way that a clinical diagnosis of tuberculosis is impossible.

It is likely, as has already been pointed out, that routine serial sections of glands and guinea-pig inoculations would increase the number of positive findings. As things stand at the moment it seems that no great reliance should be placed on a negative finding from the regional gland biopsy, and that if the result is positive it is likely that, in the presence of a suggestive clinical picture, this can be accepted as confirmatory evidence.

Conclusion

Gland biopsy is a valuable accessory means in the diagnosis of tuberculous infection of bones and joints. There were 33 (56%) positive results in 59 cases of tuberculous infection—a lower rate than those given by other authors.

A positive biopsy does not necessarily mean that the joint is tuberculous.

A higher proportion of positive results appears to be obtained if the biopsy is done early in the disease—10 out of 14 cases (71%). (21 biopsies were done within three months, but only 14 of these cases could be regarded as tuberculous on clinical grounds.)

An early positive gland biopsy gives strong support to a diagnosis of tuberculous infection before any changes that can be shown by x rays are present.

As is well known, a normal erythrocyte sedimentation rate is of no value in excluding tuberculous disease of the joints, 10 cases out of 59 having shown a normal E.S.R.

Clinical findings and progress, x-ray appearances, gland biopsy, and E.S.R. must all be taken together to obtain the most accurate diagnosis in chronic bone and joint disease.

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THE TREATMENT OF INEVITABLE, INCOMPLETE, AND SEPTIC ABORTION AN ANALYSIS OF 600 CONSECUTIVE CASES

BY

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Abortion is the most common serious complication of pregnancy, with an incidence of probably 25%. It is responsible for a greater wastage of potential and actual citizens than any disease, for it carries a mortality of 100% for the foetus and is associated with grave risks to the life and health of the mother. It is estimated that 700,000 infants are lost annually by abortion in America and that 3,500 mothers die in the United States every year as a result of this complication (McCormick, 1944). It is true there is evidence to suggest that the incidence of foetal deformity is high in these cases, but none the less the loss of potentially healthy citizens is great.

The purpose of this paper is not to discuss the prevention of abortion but to consider its treatment once it has become inevitable, incomplete, or septic. For that reason the discussion is concerned only with the maternal aspect of the problem. Throughout the series analysed we have accepted the following criteria for the diagnosis of these three conditions: (1) An abortion was considered inevitable when bleeding was associated with uterine contractions and dilatation of the internal os. (2) An incomplete abortion was diagnosed when bleeding persisted following the abortion and examination revealed a bulky uterus, usually with a patulous cervical canal, or when it was known for certain by inspection of the material passed that placental tissue had been retained. The subsequent removal or passage of placental fragments confirmed the diagnosis. (3) An abortion was considered septic when it was associated with pyrexia for which no other cause was found, offensive or purulent discharge, or evidence of pelvic inflammation. It should be noted in this respect that on occasion there is pyrexia and even hyperpyrexia during the process of spontaneous evacuation of a uterus with no preceding or subsequent evidence of uterine, pelvic, or general infection. Such cases were not included as septic abortions in the series analysed.

The recognized immediate dangers to the mother are death or serious illness as a result of haemorrhage or infection, and the following are figures given by different authorities as an assessment of the extent of these dangers. McCormick (1944) states that in America 25% of maternal deaths are due to abortion and that five in every 1,000 mothers who abort die as a result. Parish (1935) states that in 1933 463 maternal deaths were registered in England and Wales as being due to abortion, and

23% of these were attributed to haemorrhage. It was estimated from the Statistical Review of the Registrar-General for 1937 (p. 149) that 21% of all maternal deaths were due to abortion and 29% of maternal deaths from sepsis were due to septic abortion.

There are two main schools of thought concerning the treatment of abortion once it has become inevitable or incomplete. Those who may fairly be called the "non-interventionists" believe that if left alone the uterus will ultimately empty itself, and if it is allowed to do so the mother is subjected to the least possible risk. F. J. Browne (1946) advocates this attitude to treatment and quotes the work of Winter, Walthard, Dietrich, and Dubrowitsch in support of his statement that the mortality is twice as high with active as with conservative treatment. It should be noted, however, that all the results referred to were obtained before the days of specific chemotherapy. Surgeons and departments subscribing to this view require a great many gynaecological beds—or else refuse to admit abortions at all—because it often takes several weeks for an abortion, even early in pregnancy, to be completed in this way. As a result of this the anomalous situation arises that many teaching units in gynaecology, and even some special hospitals for women, refuse to admit abortion cases because the beds necessary for their treatment cannot or will not be offered.

The second school may be described as the "interventionists." They believe that all inevitable and incomplete abortions which are not rapidly and spontaneously completed should be treated by surgical evacuation of the uterus. This school requires many fewer beds, for with this treatment the stay in hospital is relatively short. This fact is not of course an argument in favour of the method unless it can be shown that in principle and practice it is at least as safe as that advocated by the "non-interventionists." We believe this can be proved.

The Case for Intervention

Now, it has for long been accepted by our surgical colleagues that a wound heals most rapidly when it is cleansed of non-viable debris. In traumatic surgery the principle of treatment is to excise dead tissue and to leave vital raw areas for healing. We suggest that in gynaecology and obstetrics there has been a tendency to ultra-conservatism in the treatment of gestational products retained *in utero*. The wound at the placental site—for wound it is—has been credited with physiological properties to which it is not entitled. It has no magical powers of rapid healing when its surface is covered with adherent necrotic debris. Necropsy rooms yield ample proof of this fact. There is even the probability of secondary infection resulting from this retained material, but this aspect of the problem is now being studied separately and will be the subject of a later publication.

Believing that the principles of wound treatment accepted in general surgery should be applied to the treatment of abortion, we instituted an interventionist attitude as the basis of treatment for all cases of inevitable and incomplete abortion admitted under our care to the Radcliffe Infirmary, Oxford. Impressed by the early results, we have continued this treatment for eight years and now present a brief analysis of the work done. Before instituting this routine one of us (J.S.) had considerable experience of the conservative attitude during resident appointments in two separate teaching units elsewhere.

A Series of Cases Treated Surgically

The series now analysed consists of 600 consecutive cases treated surgically by us in the wards of the Radcliffe Infirmary and associated private beds, and by "flying-

squad teams" for which we were responsible. This series does not include 58 cases of threatened abortion, spontaneous complete abortion, and missed abortion. There were no deaths in this group. Five hundred patients were treated in the general wards and 100 in private beds. Forty-two patients were frankly septic on admission and two of these were suffering from a generalized *Clostridium welchii* infection. Many were admitted in a critical condition as a result of extreme blood loss. When the occasion demanded it the patient was not transferred to the ward, but resuscitative measures were adopted in the casualty admitting-room, from which the patient was later taken direct to the theatre. Avoidance of unnecessary handling at this stage can be life-saving. On 71 occasions blood transfusion was administered, and this was always started before taking the patient to the theatre and was usually continued during the operation. In this way the exsanguinated patient was better prepared for operation, the risk of early transfusion reactions being masked by anaesthesia was reduced, and in the unlikely event of further extensive blood loss in the theatre there was a minimum of delay in replacing it. Rh-immunization is now avoided by preliminary testing, or is reduced to a minimum in extremely urgent cases by the use of Rh-negative blood. When the patient was suffering from extreme blood loss or shock it was often necessary, because of venous spasm, to give the blood under pressure as previously described (Stallworthy, 1939). When sepsis was present chemotherapy was begun, 2 g. of a sulphonamide being given as an initial dose, followed by 1 g. four-hourly. If haemorrhage was severe the patient was taken to the theatre without further delay; if it was not severe operation was postponed for twelve to twenty-four hours so as to obtain a satisfactory blood concentration of sulphonamide drug.

Method

Once the patient was considered fit for operation the method of treatment was as follows. After a preliminary shaving and washing of the vulva and catheterization the patient was taken to the theatre, with the transfusion still running. In critical cases the anaesthetic was not started until the surgeon was gowned and ready to operate. Early in the series ether was used extensively, but this was replaced by hexobarbitone and then by thiopentone, as being less disturbing to the patient. Small doses, often only 0.25 g., were used. After the vulva and vagina had been swabbed with flavine in spirit, 1 in 1,000, the surgeon gently examined the pelvis to determine the exact position of the uterus and the state of the cervix. Failure to make this preliminary examination can result in the soft wall of a pregnant retroverted uterus being perforated by sound, dilators, or forceps. If the canal was patulous and placental tissue was in reach it was gently removed with the gloved finger. If not, then the cervix was exposed and an oxytocic drug was injected under vision into the cleaned cervix. Early in the series 0.5 ml. of "puitrin" was used, but this was later abandoned in favour of 0.5 mg. of ergometrine. The change was made because of the generalized pallor and occasional sweating associated with the use of puitrin and the rare but unnecessary fatalities when used in obstetrics. The length of the uterine cavity was gently measured with a sound. Unless it was already patulous, as was often the case, the cervical canal was carefully dilated to the size of a No. 14-16 Hegar dilator. Sponge forceps were then carefully introduced, opened, rotated through 90 degrees, closed, and withdrawn. This was repeated until no further pieces of placental tissue were removed in this way. The cavity was then gently and thoroughly explored with a blunt flushing curette through which passed a slow stream of dettol (2 dr. to 1 pint—7 ml. to 568 ml.) at a temperature of 110° F.

(43.3° C.). This removed small fragments of tissue missed by the forceps and also stimulated uterine contractions, as shown by the rapid decrease in the length of the uterine cavity and the cessation of any bleeding. The cavity was then packed with a sterile 2-in. (5-cm.) gauze roll, which was removed six hours later. In septic cases the pack was impregnated with 10 g. of sulphathiazole powder. This pack serves a dual function. By promoting uterine contractions and by direct pressure on the placental site it safeguards against further bleeding during the stage of recovery from the anaesthetic, and with its removal it clears any small fragments or clot which if left could promote discharge, further haemorrhage, and possibly infection. Following the removal of the pack there was rarely more than a slight stained discharge, which usually ceased within forty-eight to seventy-two hours of the operation. The patient was allowed up thirty-six to forty-eight hours later, and if the home conditions were satisfactory was discharged on the third or fourth day. An attempt was made to discover the cause of the abortion, and advice was given on the necessary care during the early weeks of a subsequent pregnancy. Iron was given to combat anaemia secondary to the blood loss, and the patient was requested to report for a follow-up examination in a month.

Results

There was one death in the series, the patient being one of the two whose abortion was complicated by a generalized *Cl. welchii* infection. This patient was considered to be moribund on admission. Abortion had occurred one month previously, and following this there had been daily haemorrhage until at the time of admission the haemoglobin level was 22%. Because of the state of collapse and the general appearance of the patient a provisional diagnosis of gas-gangrene infection was made, and treatment was instituted with serum in addition to transfusion and chemotherapy pending the report of the bacteriologist on the high vaginal swab. Death occurred within twenty-four hours of admission, and necropsy confirmed the presence of *Cl. welchii* septicaemia.

As already stated, it was common for patients with suitable home facilities to be discharged on the third or fourth day. The average length of stay in hospital was 7.5 days for the 500 non-private patients.

Summary and Conclusions

Six hundred consecutive incomplete, inevitable, and septic abortions treated by surgical evacuation of the uterus followed by the insertion of a pack for six hours are analysed.

Forty-two patients were infected on admission—two with *Cl. welchii*. In all infected cases specific chemotherapy was started before evacuating the uterus.

Seventy-one transfusions were given; the average stay in hospital was 7.5 days; and there was one death in the series—a mortality of 0.17%.

Surgical evacuation of the uterus in inevitable, incomplete, and septic abortion, if carefully performed, provides a safe and efficient method of treating the condition.

The method advocated reduces the length of stay in hospital—an important factor in these days of acute shortage of beds.

The low mortality (1 in 600) may be attributed to the method of treatment and to the fact that a team skilled in handling these cases was responsible for them. Routine treatment is easy to prescribe, but on the nice decision of when to administer it may hang the balance between life and death.

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WORK OF A TUBERCULOSIS CONTACT CLINIC FOR YOUNG CHILDREN, 1941-5

BY

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In Newcastle-upon-Tyne, where the mortality from tuberculosis has always been above the average for the country, 150 children under the age of 5 years died from that disease between 1931 and 1940. In 1941, therefore, as part of a policy of investigating the causes of death in infancy and early childhood, a clinic was established for the observation and care of children under the age of 5 years who were known to have been in contact with tuberculosis. The object was to obtain information concerning the mortality and morbidity of tuberculosis in children of families containing a notified case of the disease and to ascertain the relation which this bears to the total mortality and morbidity for the same age group within the city. With this information it was hoped that it would be possible to estimate the accommodation required in Newcastle-upon-Tyne for the care of such young children.

This clinic resembles closely the diagnostic clinic for childhood tuberculosis suggested in the British Paediatric Association Report in 1943, and it seems appropriate to give a preliminary survey of the first 4½ years' work in order to show the usefulness of the investigation and the part which a clinic of this nature can play in a city tuberculosis service. This report covers the period June, 1941, to December, 1945, and the children were under 5 years of age when first examined.

Organization of the Clinic

The work is carried out by arrangement with the tuberculosis medical officer in a special clinic established in the children's department of the Newcastle-upon-Tyne General Hospital. X-ray facilities are available and parents are more willing to bring young children to such a clinic than they are to take them to a tuberculosis dispensary. Full information concerning children in infected families is sent each week to the clinic from the tuberculosis medical officer, and this is the starting-point for the observation.

For the first six months, until January, 1942, the homes of the children were visited by a health visitor of the City Child Welfare Department chosen for this work; the health visitor explained the purpose of the visit and did a tuberculin patch test. If the test was positive the parents were asked to bring the child to the clinic for clinical and radiological examination. At the beginning of 1942 this arrangement was changed. All the children are now visited and their parents are asked to bring them for examination (tram or bus fares are paid when this seems necessary). The patch test was abandoned and the intradermal Mantoux test (0.1 ml. of 1 in 1,000 old tuberculin) is used as a routine; every child is radiographed.

During the war years demands upon the time of mothers of young children became heavy, and especially so with illness in the house. From the outset, therefore, the work was organized to avoid waste of time in hospital or unnecessary return journeys to the clinic. The tuberculin test done at the first visit is read either by the health visitor calling at the house on the third day or by the doctor at the welfare centre nearest the child's home. When the result is known the clinical, radiological, and social findings