to the skin (Fig. 12); sometimes this practice has allowed a secondary extirpation. Even when secondary

Fig. 10.—Unilateral exclusion with end-to-side anastomosis.

resection is not possible, the improvement is such that the patient has no trouble, gains weight, and, practically, is cured.

Fig. 11.—Total exclusion (previous fistula of the caecum).

This, gentlemen, is what I wished to say about the surgical forms of ileo-caecal tuberculosis, which are now

Fig. 12.—Total exclusion (Hochenegg's method).

well distinguished from other diseases of that region, and in which the various indications for operation seem to us well established.

Clinical Remarks

ON

THE TREATMENT OF SURGICAL TUBERCULOSIS.

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THE striking improvement in the results of treatment of medical forms of tuberculosis, particularly of pulmonary tuberculosis, during the last decade is thoroughly well recognized and appreciated, but it is doubtful whether it is realized by the general body of the profession that during the same period an improvement equally if not more marked has been brought about in the results of treatment of those forms of tuberculosis generally looked upon as surgical. The reason for this probably lies in the fact that in connexion with the treatment of surgical tuberculosis there has been no striking innovation such as the introduction of open-air treatment in the case of phthisis, but that the improvement is due rather to gradual perfection in the details of the application of the principles of surgical cleanliness in the first place, and to advance in pathological knowledge in the second. Both these factors have helped to diminish the number of cases in which a secondary infection by pyogenic organisms is added to the original tuberculous infection, and herein lies the key to the advance that has been brought about. Sinus formation is, however, unfortunately still often spoken of and described in the textbooks as being a stage of tuberculosis, and the bearing on the case of the added element of pyogenic infection is consequently to some extent lost sight of. The great importance of due recognition of this distinction is twofold. In the first place, the principles of treatment that apply to a case of pure tuberculous disease are very different from those suitable to a case of mixed infection, and in the second the prognosis of the case is profoundly affected in an adverse direction when once a secondary pyogenic infection has been added to a tuberculous lesion.

Tuberculosis of bone or joint is, under appropriate treatment, curable in the great majority of cases, but once sinuses have formed and the bone or joint has become infected secondarily, the case is rapidly drifting into the incurable class with the prospect of the eventual onset of lardaceous disease. It is clearly, therefore, of the highest importance to be careful in these cases lest operative measures should lead to a mixed infection, and thus contribute to the production of a condition far more serious than that for which they are undertaken. The risk of such a result is at the present day considered to be almost negligible, and with careful and thorough aseptic technique such should be the case. But that this risk is even in these days very real must be recognized by all who have had experience in the out-patient departments of large hospitals and especially of children's hospitals. I may seem, perhaps, to unduly labour this point of sinus formation; I feel, however, that it is necessary to emphasize its importance, for, great as the improvement has been in the last few years, the results might well be still better, and no doubt will be as it becomes more and more realized that in strict attention to detail lies the hope of success. Infected sinuses are, perhaps, most frequently seen in cases of spinal disease, and, unfortunately, it is in this very class of case that such a result is most to be deplored, for, once a pyogenic infection of the carious vertebrae has taken place, the chance of cure becomes very poor, owing to the impossibility of dealing radically with the seat of disease; whereas, apart from this contingency, tuberculous disease of the spine is of all forms of bone disease probably that which most readily becomes cured.

Attention to the following points in the treatment of spinal abscess and tuberculous collections generally will, I believe, help to minimize the chance of subsequent sinus formation.

PREPARATION OF THE PATIENT.

The patient—I refer particularly to hospital patients—is usually in bad general condition from pain and insuffi-

cient nourishment, and hence is particularly liable to pyogenic infection of a wound. It is, therefore, of great importance to improve the general condition as much as possible before operation by complete rest in bed (in the open air, if possible), plenty of good food, tonics, etc.

THE OPERATION.

The skin incision should be made in a position where the structures overlying the abscess are thick, so that their subsequent suture will leave as considerable a mass of tissue as possible between the skin and the abscess sac. For if the incision passes through skin thinned out and adherent to the abscess the sutures will almost certainly pass directly between skin and abscess cavity and thus form lines along which direct infection will be liable to occur. In the case of a psoas abscess, for instance, it is preferable to make the incision above Poupart's ligament and parallel to its outer half, so passing through the abdominal muscles before the abscess is reached. An incision in this position has the further advantage of giving access to the whole cavity, thus avoiding the necessity for a second incision, and so a second possible source of infection.

When the sac of the abscess is reached it is well to draw the superficial structures to one side before opening the abscess, so that the incisions in different layers, and consequently the lines of suture, shall not lie directly in contact with one another. This prevents the several layers becoming adherent to one another; and, moreover, should the abscess refill and the scar in the sac stretch, the parts immediately over it do not become thinned and liable to give way.

The use of the fingers to explore the cavity should be strictly avoided for obvious reasons, for all the information required can be equally well obtained by means of sterile instruments.

The curetting should be carried out with as much gentleness as is consistent with the complete removal of the lining of the sac, in order to avoid hæmorrhage and subsequent filling of the cavity with clot, all débris being thoroughly washed out and bleeding arrested by free douching with hot sterile saline solution. The cavity is then gently dried with pledgets of sterile gauze and some sterilized iodoform introduced. This is safer than using the ordinary iodoform emulsion, which may be neither sterile nor antiseptic. The application of strong antiseptics to the sac wall is of doubtful utility, and is at least as likely to do harm as good, owing to the destruction of tissue which is caused thereby; while, on the other hand, there cannot be many tubercle bacilli within reach of an antiseptic so applied, if the curetting and flushing have been efficient.

Closure of the wound should be complete and thorough, and attained by the introduction of several rows of interrupted sutures; the sac, the muscles or other overlying tissue, and the skin all being sutured separately in lines as far as possible, not superimposed, for the reasons mentioned above. I am strongly in favour of catgut for the suture material; in addition to the advantage of being absorbed, it can be sterilized with more certainty and facility than other suture materials.

A drainage tube should on no account be used, for, how-

ever carefully the subsequent dressings are carried out, there must be a great risk of infection from the skin along the track of the tube, with a resulting sinus. There is no need for drainage if the operation has been properly carried out, occlusion of the cavity being largely obtained by the dressings, and, in the case of a psoas abscess, by the intra-abdominal pressure.

TREATMENT AFTER OPERATION.

The parts should be kept at rest for a prolonged period in order to ensure that the cavity is soundly healed before the patient is allowed to pass from observation. Failure to attach sufficient importance to this principle is the cause of many sinuses forming after the wound has apparently soundly healed in the first instance. How often one sees cases that have left the hospital apparently cured, return from the convalescent home with an incurable sinus! I make a practice of fixing the part with suitable apparatus and of keeping the patient in bed for at least three weeks after the operation wound has healed, and am sure that this period is too short

rather than the reverse. Refilling of a cavity treated with the precautions above described is in my experience comparatively rare, because, in the great majority of cases, the collections so treated really come into the category of residual abscesses, the primary cause having been previously cured. When, however, refilling does take place, it may be due either to continued activity of the primary disease, or to failure of the operation to remove the whole of the disease. Such a recurrence may be treated in exactly the same manner as before, with the prospect of cure, and is certainly no indication for permanent drainage, the employment of which would probably end in disaster.

ASPIRATION.

Treatment of a tuberculous collection by this method should be condemned as inefficient and risky. It is inefficient, because the more fluid part of the contents only can be withdrawn by this means, and the wall of the sac (which, it must be remembered, is actively tuberculous) is left untouched.

The risk of aspiration lies in the fact that the needle track is liable to become the seat of tuberculous disease, the skin at the site of puncture becoming gradually destroyed by the tuberculous process, and a channel so opened up for the infection of the original cavity with pyogenic organisms, the result being an infected and intractable sinus.

HIP DISEASE.

With regard to the treatment of hip disease, it may be said at once that the old controversy between palliative treatment and early operation is by no means definitely settled.

Treatment by rest, with extension where necessary, abscesses being treated as already described, is less risky, is more prolonged, and gives a better final result; whereas early operation is accompanied by greater risk, but saves time at the expense of a final result that is not so good.

I have always adopted palliative treatment, and have no cause to regret it. The final result, even after complete

Fig. 1.

destruction of the joint, is far better than the average result obtained by an early excision of the joint, provided that the case is kept under treatment until final cure has taken place, so that bad deformity is prevented. If this be true, it necessarily follows that in the less severe cases—and they constitute the great majority—the final result is still better than that after excision.

The most valuable inquiry that I know of into the final results in a large number of consecutive cases treated at one institution is that carried out by Drs. Gibney, Waterman, and Reynolds, who publish an analysis of 150 cases of hip disease treated at the New York Hospital for Ruptured and Crippled over a period of twenty years.

Of these, 25 were still under treatment, and 11 had died. The remaining 114 cases were examined finally at an interval varying between five and twenty years after leaving the hospital.

Of these, 107 cases "were cured and able to follow an occupation without the slightest trouble," and the remaining 7 were cured of the disease, but were suffering from considerable deformity. Of the cured cases, in 9 only was the joint entirely fixed, the remainder being movable to a varying extent.

Shortening was absent in 21 cases, under 1 in. in 71, and over 1 in. in 36.

Flexion was absent in 47 cases, under 10 degrees in 77, and in the remaining 30 cases it was under 30 in.

The treatment adopted consisted of rest and extension, abscesses being aspirated or opened and curetted. In only 4 cases was excision performed.

These results must assuredly be looked upon as a strong encouragement to follow the plan of treatment adopted. In order to obtain the best final results the great essential is undoubtedly to keep the limb at rest for a prolonged period after all signs of active disease have disappeared, at least two years when no abscess has formed, and at least three years after abscess formation being usually necessary.

The great value of prolonging the treatment is seen particularly in the surprising way in which movement finally returns even in bad cases. The following is a typical case, and serves to illustrate the point.

A child, aged 4, was under my care in November, 1902, for hip disease of two months' duration. The hip was fixed, extremely tender, and markedly flexed and adducted. The child's condition was, moreover, very poor, and the temperature rose every night to 101° or 103° F.

Extension was applied in the adducted and flexed position, but the condition remained practically unaltered for three weeks. The temperature then gradually fell to normal, the tenderness disappeared, and the position of the limb steadily improved, so that at the end of six weeks it was straight. Three weeks later the child left the hospital in good condition in a splint.

Progress was satisfactory for six months when a collection appeared on the front of the thigh. This was opened, curetted, and closed, but reformed some months later, and was again operated upon. No further trouble occurred, and the splints were discarded in May, 1906, three and a half years after the child was first treated. Although the joint was fixed at this time movement soon appeared and steadily increased, and at the present time flexion is possible up to 60 degrees.

The marked degree to which restoration of function takes place, even after severe tuberculous disease of a joint, is evidence that *per se* tuberculosis of joints does not specially tend to result in bony ankylosis. On the

other hand, it is well known that new bone formation is particularly well marked after pyogenic infections of bones and joints. Again, examination of museum specimens of tuberculous disease of bones and joints in which the evidence of new bone formation and of bony ankylosis is marked, shows that in the majority of instances sinuses were present, and secondary pyogenic infection had therefore taken place.

It seems clear, therefore, that the prospect of a useful joint after tuberculous disease is very greatly diminished if sinuses have been allowed to form and the joint consequently to become infected; so that here again is a further very strong incentive, if one were needed, to make use of every possible precaution against sinus formation.

In a few rare cases tuberculous foci can be detected in the neck of the femur before the disease has involved the hip-joint, and can be successfully dealt with by early operation. The chief difficulty lies in diagnosing the condition before the joint has become involved. The usual signs of early disease of the hip-joint are present, probably owing to a simple synovitis caused by the neighbouring inflammation.

In addition, some degree of thickening about the region of the femoral neck may be noticed, but beyond this there is usually little to be made out in early stages. Here x-ray examination is a most valuable aid in diagnosis, and might with advantage be resorted to more frequently in cases of early hip disease, for by this means the number of cases in which a diagnosis can be made in early stages promises to be considerably increased. I have recently seen two cases in which x-ray examination demonstrated a focus in the femoral neck, the clinical evidence being quite insufficient to justify such a diagnosis.

THE KNEE-JOINT.

Conditions in the case of the knee-joint favour resort to operative interference much earlier in the course of the disease than in the hip-joint. From the anatomical point of view the knee, unlike the hip, is easily accessible in all its parts, so that the entire disease can be eradicated. In addition, if the operation be undertaken before the destruction is great, and thoroughly carried out,

the results are extremely satisfactory both as regards the final condition of the joint and the time taken up by treatment. If complete rest, and if necessary extension, does not quickly result in improvement, and especially if the disease primarily involves the synovial membrane, as it does in the great majority of cases, there is everything to be gained by the performance of erosion—that is, complete removal of all the diseased tissues—before the bones and cartilages have become affected, and the crucial ligaments have been destroyed.

The result in the majority of cases is complete cure, without shortening of the limb, and with a strong stable joint endowed with a varying degree of mobility.

The chief objection to the performance of arthroscopy for tuberculous disease of the knee is the tendency to flexion, either alone or combined with displacement of the tibia backwards. These troubles may, however, be prevented in the vast majority of cases and a satisfactory final result secured, and with this end in view the follow-

Fig. 2.

ing considerations in connexion with the operation and after-treatment are of importance.

The operation must in the first place be complete and thorough, and every precaution must be taken to avoid the possibility of any infection of the wound, for there is reason to believe that the tendency to flexion, after an apparently satisfactory arthrectomy, is due in some cases at least either to persistence of tuberculous disease in a mild form, or to a septic arthritis of a low type of virulence. That this is the case is shown by the fact that the joint as well as tending to become flexed is hotter than the sound joint, and is, moreover, painful, especially if any attempt is made to move it.

In order to ensure a thorough exposure of all the disease the joint must be widely opened and for this a very free transverse incision dividing either patella or ligamentum patellae is best. In the majority of cases an additional oblique incision is required passing from the transverse one along one side of the patella to the top of the suprapatellar pouch. The whole of the synovial membrane must be completely removed by careful dissection with knife and forceps, special care being taken to reach the top of the suprapatellar pouch and the pockets behind the condyles of the femur. It is in these pockets that disease is so liable to persist and thus lead to flexion afterwards.

The crucial ligaments must next be cleared of synovial membrane and carefully inspected, for on the condition of the posterior of these the remaining stages of the operation depend. Should the posterior crucial ligament be destroyed displacement of the tibia backwards must of necessity occur, but if it can be saved no displacement backwards can take place. If then the posterior crucial ligament is found to be destroyed it is necessary to abandon arthrectomy and to perform excision so as to obtain ankylosis, otherwise displacement of the tibia backwards is certain. Should the ligament be intact, the arthrectomy may be completed by removing any disease of cartilage or bone that may be present, suturing the capsule and patella and closing the wound.

Should disease of either bone be present the cavity left after thorough curetting may with advantage be filled with small pieces of decalcified cancellous tissue and sterilized iodoform. It is a striking fact that in some cases, even when considerable bone disease is present and has to be treated in this way, it is possible to obtain a good joint with free movement, although the prospect of such a result is necessarily diminished by the presence of bone disease. Such a case was shown by the writer at the Clinical Society three and a half years after operation.¹

As regards after-treatment the essentials are prolonged rest and avoidance of any attempt to move the joint; for it seems certain that flexion and the persistence of a chronic arthritis (tuberculous or septic) has been largely caused in the past by discarding splints too soon under the impression that this must be done if any mobility of the joint is to be obtained, and in this manner no doubt arthrectomy of the knee for tuberculous disease got into disrepute some years ago.

The knee should be kept at rest for eighteen months after the operation in a rigid apparatus which is gradually discarded during the following six months. If there has been any sign of arthritis, such as heat or tenderness, after the wound has healed, the period of rest should date from the time that such signs disappeared. In young children, again, the period may with advantage be lengthened, for in them the tendency to flexion appears to last a longer time.

During this period of rest the thigh should be massaged daily in order to maintain the nutrition of the extensor muscles as far as possible, and so prevent any tendency that the hamstrings may have to overaction when the splint is discarded.

These measures will succeed, with few exceptions, in preventing the tendency to flexion. No attempt by active measures, such as forcible moving, should be made to obtain mobility of the joint after the splint is removed, for this again is liable to set up arthritis, and so cause flexion. Nevertheless, in many of the cases movement soon begins to return, and gradually increases, as it does in the case of other joints after tuberculous disease if rest has been maintained for a sufficient period after all signs of active disease have disappeared.

The accompanying photographs, taken three years after operation for extensive tuberculous disease, will serve to illustrate the degree to which movement may gradually develop without any active interference on the part of the surgeon. If, on the other hand, forcible attempts are made to move the joint, a troublesome arthritis will almost certainly be set up, the joint becoming hot, painful, flexed, and stiffer than ever.

TUBERCULIN.

No reference has so far been made to the use of tuberculin in the treatment of surgical tuberculosis, the reason being that in the lesions hitherto spoken of the treatment must be considered to be still on trial. For some time past I have been giving tuberculin in all cases of tuberculous disease of bones and joints, and although it is not possible to go further than recording one's impression of the result, that impression is that in the majority of cases the effect has been beneficial and in a few cases markedly so, especially in several cases of severe hip disease that have improved with considerably greater rapidity than, as far as one can judge, is usually the case.

In the treatment of tuberculosis of the urinary tract, however, it is quite certain that tuberculin is of the greatest service, and this is, I think, now generally recognized. Its value is enhanced, and its effects the more easily realized, from the fact that hitherto the treatment of tuberculous disease of the bladder has been so extremely unsatisfactory and disappointing.

The following case in which all the usual methods of treatment were tried without any sign of arresting the progress of the disease, and in which under treatment with tuberculin apparently complete cure took place, illustrates very well the great value that the treatment has in some cases, even though advanced and apparently hopeless.

A woman, aged 29, was admitted into Guy's Hospital under my care on September 13th, 1905, with tuberculous disease of the right kidney and the bladder. The kidney, which was in an advanced stage of tuberculous pyonephrosis, was removed, together with 6 in. of the ureter which was also tuberculous. The patient at first did well, and the wound healed by primary union, but ten days later she began to lose ground, the bladder symptoms increasing and the temperature rising every evening to about 100° F. At the same time the wound gradually reopened and exposed a mass of pale granulation tissue, discharging a small quantity of pus.

In spite of every care and attention, the patient a month after the operation was steadily going downhill. She was at this time very thin and pale, the temperature rose every night, the urine, which contained blood and pus, was passed with great pain every half-hour, and the wound in the loin showed no sign of healing. Moreover, at this time all local treatment of the bladder had to be discontinued, as the passage of a catheter caused such intense pain. At this stage, all other treatment having completely failed, the tuberculo-opsonic index was taken on two occasions, and was found to be 0.62 and 0.84. Treatment with tuberculin was then commenced by Dr. Eyre, and was continued for five months. Improvement began immediately, and made steady, although slow, progress under the treatment. The condition of the urine gradually improved, the wound slowly healed, and the pain and frequent micturition diminished. When the last injection of tuberculin was given, five months after the first, the patient was strong and well, of a good colour, and had regained her normal weight. The wound, moreover, was soundly healed, and the urine, which now contained no blood or pus, was passed without pain and at normal intervals.

REFERENCE.

¹ *Clin. Soc. Trans.*, vol. XXXVII, p. 247.

INTERNATIONAL ANTIALCOHOL CONGRESS.—At the invitation of the Swedish Government, the eleventh International Antialcohol Congress is to be held at Stockholm this year, from July 28th to August 3rd. Among the subjects to be discussed are alcohol and mental disease; alcohol and race degeneration; alcohol and responsibility; alcohol and crime; alcohol and sexual questions; the place of the school in the war against alcohol; the press and alcohol; alcohol, abstinence, and sick benefit societies; alcohol from the insurance point of view; the Gothenburg system; the organization of modern Swedish temperance societies. Popular addresses will be delivered on women and the antialcohol campaign; young people and alcohol; alcohol and artistic creation; alcohol and social questions; alcohol and the upper ranks of society. All communications relative to the Congress should be addressed to Professor Dr. Kurt Wallis, Tegnérsgatan, 2, Stockholm.