DISCUSSION

Dr. A. L. Blesh, Oklahoma City, Okla.—In my experience, primary tuberculosis of the fascia has been most rare, and even secondary involvement in a tuberculosis process has not been common. Very little mention is made of it in the literature on the subject. The very course of tuberculosis and the selective action of the germ of necessity makes for this rarity.

Tuberculosis is primarily a lymphatic gland disease. What we speak of as pulmonary tuberculosis is primarily a disease of the lymphatic glands of the lungs. One can see and understand how from a primary gland infection the fascia may be secondarily involved by extension. I do not believe that tuberculosis occurs anywhere primarily except in lymphatic gland structure and through the lymphatic circulatory system.

Dr. Marcus Skinner, Selma, Ala.—I have seen one case of tuberculosis of the abdominal fascia. It is well to bear in mind in exploring the abdominal wall for a condition of this kind that such a clinical entity exists, and that in dealing with such a condition one must be careful in not opening the peritoneal cavity, thereby running a risk of setting up a peritoneal tuberculosis.

ON THE SURGERY OF BONES AND JOINTS WITH A DESCRIPTION OF NEW OPERATIVE TECHNIC*

BY MARCUS SKINNER, M.D.,
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It is my purpose in presenting this paper to discuss certain fundamental principles of bone and joint surgery, and to present for your consideration and criticism some operations in the technic of which I have departed from the accepted methods.

One of the potent causes of failure in dealing with the acute arthritis, the traumatic joint, the recent fracture and the diseases of the nervous system that result in deformity, is the failure of the practitioner to consider the deformities as part of the ultimate pathology; and his failure to be constantly conscious of the fact that these conditions progress steadily toward a specific deformity. Perhaps it may be stated that the pathology and structural deformity resulting from inefficient reduction of fractures, from poliomyelitis and arthritic disease is not constant and specific enough to warrant a division into types, and that alteration of alignment follows no definite course. This viewpoint I want to deny.

Every arthritis, or penetrating joint wound, and a great many juxta-articular traumata, are potential deformities. They progress steadily toward a specific deformity in the absence of efficient treatment. Such treatment implies splinting in the position exactly opposed to the deformity that the joint favors when inflamed. Every joint has an especial position that it takes when inflamed, and with the exception of perhaps the elbow, these positions are detrimental to the repair of the joint, and in the event of ankylosis, leave the joint in a position that affords a minimum of function, makes an arthroplastic procedure more difficult and lessens the chance of a good result from such procedure.

An inflamed elbow will automatically take a position of flexion just short of the right angled position. A shoulder assumes a position of adduction and slight forward flexion. The hip can be depended upon to show flexion and adduction; the knee, flexion; the ankle, extension; the great toe, flexion; and the wrist, ventral flexion.

The prime consideration in the treatment of arthritis of whatever nature, whether due to a wound or metastatic infection, is to aid Nature and guard against deformity by proper splinting. Specifically, the adducted and flexed hip should be fixed in a position of slight abduction and the flexion overcome, the flexed knee should be straightened to full extension, the ankle should be dorsi-flexed and the flexed wrist must be hyperextended. In the case of the hip and knee, traction is added to the fixation, but really traction is of less value than the position *per se*. Just before and immediately after the outbreak of the European War I was serving in the clinic of Sir Robert Jones. For many months the soldiers that consulted him were deformed because these principles had been ignored and entirely preventable deformities were inflicted upon them. Especially vivid is the memory of the shoulder cases that came back to England during the first few months of t'

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war, most of them having permanent adduction deformity because of lack of treatment in the abducted position.

There is nothing in this positional treatment incompatible with the revolutionary work of Wilms, of the Belgian Army. As you know, in certain joints showing purulent arthritis, after incising the joint, he made the patients actively move the joint to aid in its drainage. In certain cases the method is of value, but after the active motion the joint ought to be brought back to the position antagonistic to the deformity favored by the joint in question.

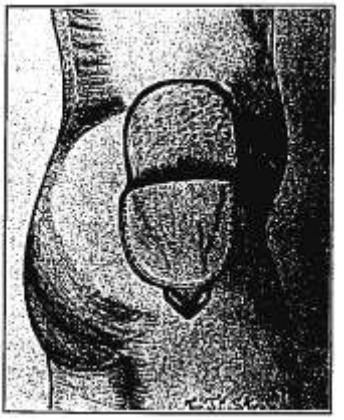

Fig. 1.—Author's technic in performing arthroplasty of the hip.

OLD DISLOCATIONS OF THE ELBOW

The successful treatment of this condition seems to me to be one of the most difficult things in surgery. The late Dr. John B. Murphy has said that the proper performance of his operation of arthroplasty of the knee made the resection of the Gasserian ganglion look like vacation exercise. Difficult as arthroplasty of the knee may be, the management of an old dislocated elbow is equally so. Those of you who have operated upon elbows that have been dislocated from four months to two years know that the chief difficulties are avoidance of the ulnar nerve and in the obtainment of a field that allows accurate manipulation and replacement of the joint with no injury to the coronoid and olecranon processes of the ulna. The choice of skin incision is rather important, as the successive step depends upon what method of approach has been used. The classic incisions are those of Von Eiselsberg, Schlange, and the two lateral incisions of John B. Murphy. The incision of Von Eiselsberg, four inches in length, drops

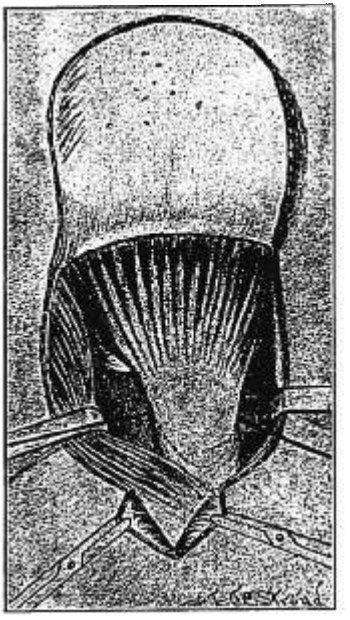

Fig. 2.—Author's technic in performing arthroplasty of the hip.

from a point just behind the external condyle down to a level with the radial neck. The objection to this incision is that it does not sufficiently expose the olecranon fossa, and if it is found necessary to improvise a fascial flap to cover a raw area of bone it affords no soft tissue from which a flap may be made.

Schlange operates through a more or less inverted horse shoe shaped incision. After making this incision he divides the ulna with a saw and then reflects a large flap containing the olecranon upward. This incision gives ample exposure, but requires that the olecranon be nailed to the ulna when the operation is complete; and following the tremendous effusion that occurs in these cases, the pedunculated skin flap may necrose. The two lateral incisions of Murphy are objectionable because the ulna nerve must be isolated during such dissection and manipulation, and later by scar formation the nerve may be severely injured.

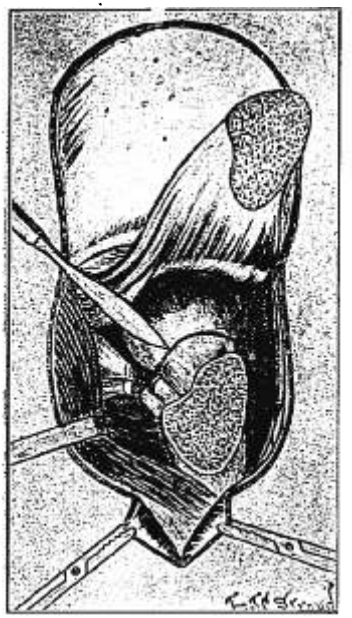

Fig. 3.—Author's technic in performing arthroplasty of the hip.

Fig. 4.—Author's technic in performing arthroplasty of the hip.

The sample operation that I submit seems to me to have obviated these disadvantages. The incision, slightly S-shaped, starts about three-quarters of an inch above the tip of the olecranon at a point midway between the olecranon and humerus, passes downward and forward to a point in front of the radial head, and then downward to a point just below the radial neck. Through this skin incision the joint capsule and fibrous tissue is then freely incised with a knife, and the tissues dissected back from around the head and neck of the radius. The neck of the radius is then divided by bone-cutting forceps and the head and neck removed. After removal of the radial head the field of operation is much enlarged and ready access may be had to the olecranon fossa and the articular surface of the humerus. This fibrous tissue is then carefully excised and the joint reduced. The operator should not be content until the joint goes through its full range of movement. If the tip of

the coronoid or other bony projection is broken, it should be removed and the raw area of bone covered by a soft tissue flap, which can easily be obtained from the tissue which formerly surrounded the radial head. The elbow should then be flexed to a point about 60 degrees from the straight, the forearm fully pronated and while in this position the capsule, soft parts, and skin should be sutured, using interrupted

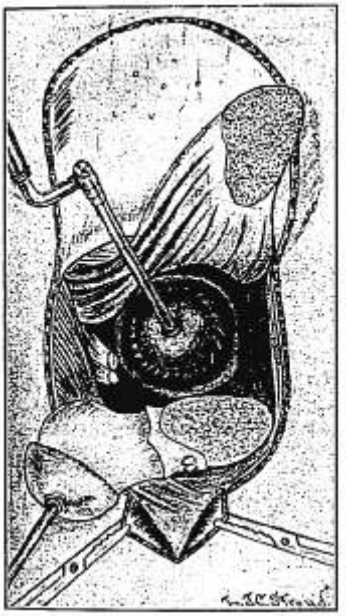

Fig. 5.—Author's technic in performing arthroplasty of the hip.

sutures for all three layers. By using the automatic needle of Reverdin and a trained assistant, all deep sutures may be placed and tied without ever touching the catgu with the gloved hand. After the skin closure voluminous dressings should be applied and the tourniquet removed. The elbow, arm and forearm should then be encased in a light plaster and a large fenestration made over the posterior surface of the elbow.

At the end of two or three days an inspection of the wound should be made. There will have been much serous discharge and a rather tense appearance of the joint. Contrary to the usual advice, I prefer not to aspirate, but await the spontaneous evacuation into the sterile dressings. There are some who advise the be-

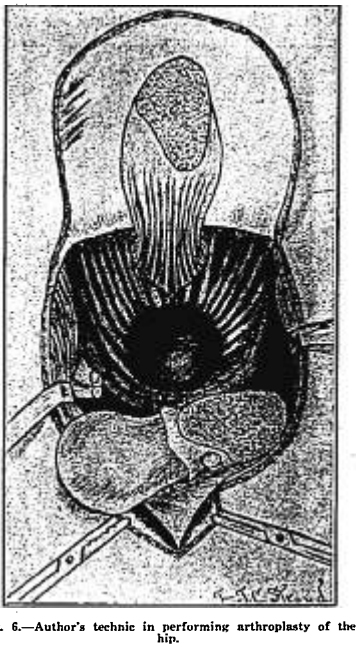

Fig. 6.—Author's technic in performing arthroplasty of the hip.

ginning of movements at the end of three days. It appears to be sound surgery to wait until there is skin union and the sutures have been removed. At the end of eight or nine days the plaster should be removed and the patient encouraged to actively move the joint. If full movement has not returned in two months forcible passive motion under an anesthetic should be done. A patient does not miss

the head of the radius so far as function is concerned and there is only a slight depression left at the old site of the radial head.

ARTHROPLASTY OF THE HIP

This operation in selected cases of ankylosis of the hip is one deserving great attention. A successful result in these cases is one of the most gratifying things in surgery. I have personally operated upo six cases and assisted in about an equa number. Two of the cases that I have done

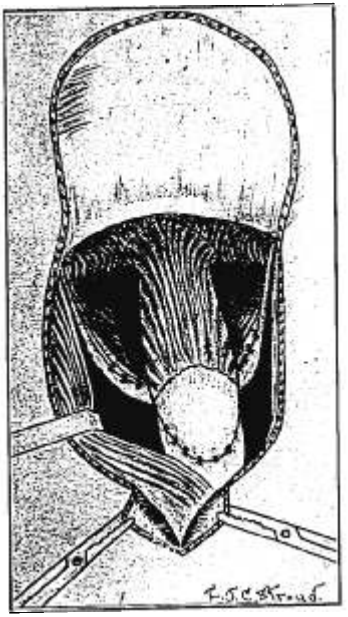

Fig. 7.—Author's technic in performing arthroplasty of the hip.

have suffered from ankylosis of both hips, which condition materially affects the after-treatment. I have a third case o double ankylosis to do this month, so you will see that the condition is by no means a rare one. These double ankyloses have been of the metastatic type and they have had no other joints involved.

The technical difficulty that I have experienced with the essential step of the Murphy operation, namely, the securing of the fascial flap, has led me to modify the operation and I have practiced the modification in two cases with good results. The technic of arthroplasty according to the modification which I have practiced is as follows:

1. Reflect a U-shaped flap off the external aspect of the thigh over the hip joint the base of the U being over the great trochanter. Let drop from the base of the U a straight incision of two inches in length. This flap includes skin, fat and fascia lata. If the limb is ankylosed in flexion deformity there is a tendency on the part of the operator to place the incision on the posterior part of the thigh, which increases the liability of injury to important nerves.

2. Pass a Gigli saw behind the muscular attachments of the trochanter and divide the bone obliquely downward.

3. Reflecting the flap containing the fat and fascia lata upward and turning up the great trochanter, we approach the site of the joint.

4. If possible, identify the capsule, incise it and strip it back well on to the ilium. In cases of long standing it is difficult to strip back this capsule as it is more or less fused with the bone. In such cases there is more difficulty in locating the old articulation.

5. With a large heavy chisel sever the femur from the ilium, being careful that the line of incision is at the site of joint and not on the neck of the femor.

6. Flex and forcibly adduct the thigh and pass a towel under the femoral neck for purposes of traction. By these maneuvers the fermoral head is dislocated and excellent exposure obtained.

7. Ream out the acetabulum and fashion the femoral head, so that when the joint is reduced it will move freely. The tendency is to remove too little bone.

8. Having done this Murphy reflected the fascia lata from the skin flap and interposed it between the bones. I have found that it is often difficult to get the fascia around the base of the glutei muscles, and that if it does reach to the inner margin of the acetabulum there is tension

and that the base of this flap is much puckered when we bring the great trochanter back to its normal relation with the femur. I have found that if I ignored the fascia and dissected up the two outer glutei from their point of insertion into the trochanter and then perforated this muscle flap at its base, I could thread the great trochanter through the perforation and solve this flap difficulty. By threading the trochanter through this perforation the two outer glutei muscles drop naturally in between the bones and they are quite thick enough and broad enough to prevent ankylosis. I think that this interposition of muscle aids also in hemostasis. We are aware of the hemostatic usefulness of muscle in other parts of the body. Certainly the two cases in which I have employed the technic have shown less oozing. The flap is secured in position by a few interrupted sutures and the great trochanter is secured to its old place on the femur by suturing its margins or by nailing it.

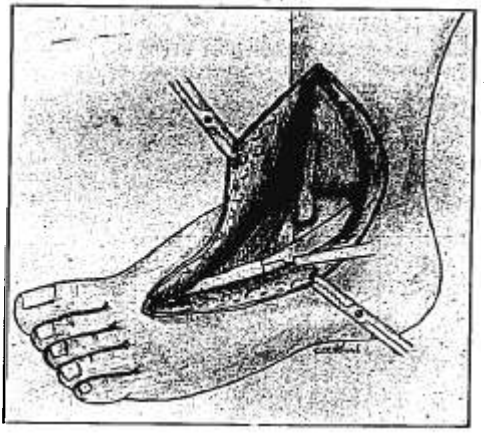

Fig. 9.—Bone graft technic for tuberculosis of the ankle.

The skin wound is then closed and the extremity extended. The patient is placed on an abduction frame with traction or in a plaster cast. Just at this point comes one of the most important steps of procedure, namely protection of the patient from potential deformity. What deformity should we expect if the patient gets motion or does not get motion? We must anticipate the deformity typical of ununited fracture of the neck of the femur, namely, eversion and outward rotation of the extremity. So in putting up the case we must be certain that we rotate the femor in and secure it there. If we allow the limb to grow into this natural end deformity of ununited fracture of the femoral neck we shall never get it back in good position.

We dress this operation up with a fancy name, "arthroplasty of the hip," but we must never forget that we are really giving the patient an ununited fracture of the fem-

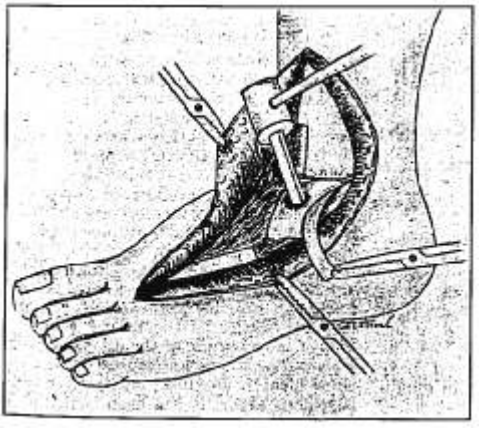

Fig. 8.—Bone graft technic for tuberculosis of the ankle

oral neck which we hope will function painlessly and have stability.

There is one other point that ought to be mentioned as a step of the operation. During the time of ankylosis, particularly in cases showing adduction deformity, the adductors and fascia at the inner side of the thigh become contracted. They must be divided subcutaneously with a tenotome. At the end of ten days the sutures are removed, massage is started and slight active and very gentle passive motion encouraged. Attempts at weight bearing ought not to be made before the end of six or seven weeks and the patient ought to be kept under observation for a year. Increased motion can be obtained many months after the operation by forcible movement under an anesthetic. I have seen these hip cases show splendid mobility for nine months and then become fixed. I shall therefore refrain from reporting my personal results until one year after operation. The cases I have done all show satisfactory motion except one, which is firmly ankylosed again.

Fig. 10.—Radical cure of tuberculous ankle five months after bone grafting.

TUBERCULOSIS OF THE ANKLE.

The profession as a whole has wisely taken a conservative attitude in the treatment of joint tuberculosis in the young, and have accepted surgical interference as indicated in adults. I know of only one great surgeon in the English speaking world who still believes in radical attacks upon tuberculous joints in the young. He is Sir Harold Stiles of Edinborough.

Fig. 11.—Radical cure of tuberculous ankle five months after bone grafting.

Fixation is the accepted treatment of today. Even the ankylosing spine operations of Albee and Hibbs are conservative in that they merely aim at more complete fixation than can be obtained by braces or cast. Though we are agreed that the operative spinal fixation methods are far superior to braces, yet not much has been done in the perfection of similar technic for the peripheral joints. Has this failure to fix joints by bone grafts been due to fear of possible absorption of the graft in the presence of the active lesion, to a fear of aggravation of the disease by a possible operative wound sepsis, or to a cherished ideal of possible motion after the tuberculous arthritis has been healed by nature? One must admit that occasional tuberculous arthritis results in cure with

good motion, but it is equally true that most surgeons are eminently satisfied when their patient begins to show a sound, painless ankylosis in a good position.

The attempts to fix the peripheral joints by bone grafts have been few in number and have been developed largely as an extra articular arthrodesis.

I have seen Dr. Albee attempt an ankylosis of the tuberculous hip by means of a bone graft extending from the great trochanter to the lateral aspect of the ilium. I do not know what result he obtained. In his book he has a diagram of a bone graft extending from the lateral aspect of the posterior part of the os calcis to the tibia.

Carlos La Valle, of Beunos Aires, in March of this year, described a technic for grafting the tuberculous knee, by means of which he affected an extra-articular fixation of the knee and at a later date removed the supports. I want to present to you the case report of a girl of fifteen and describe the bone graft technic for tuberculosis of the ankle.

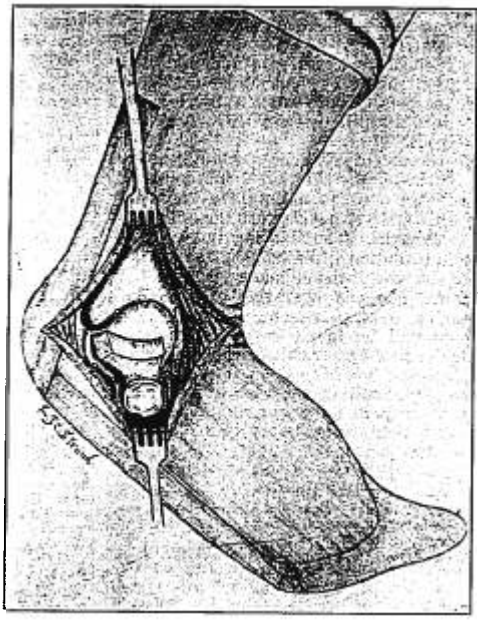

Fig. 12.—Use of stocking in operations on the foot.

The patient came under our care after having one and a half years of fixation in a plaster cast with no improvement that her parents could appreciate. The ankle clinically was one of tuberculosis, being a bit red and allowing a little painful motion. The radiogram which I shall show you showed active disease and the patient had pulmonary involvment.

I operated as follows: With the foot in the equinus position a straight incision was made from a point three inches above the articular line of the joint to two inches below the articulation. The soft structures including the annular ligament were incised and with a twin saw a longitudinal gutter two and three quarter inches in length was made in the tibia. A similar gutter about three quarters of an inch was then made on the neck of the astragalus and a hole bored straight down into the neck of the astragalus. A bone graft that had been removed from the other leg before the diseased ankle was opened was then inserted in the hole in the astragalus and driven in gently with a hammer. When this end was secure the foot was brought back to a right angle position and the upper end of the graft mortised into the tibial gutter by slight taps with the hammer. It fitted so securely that no sutures were necessary to hold it in place. It was quite obvious that we were putting the graft through tuberculous area.

The first x-ray was taken six weeks later and showed the graft uniting and a reparative process under way. The cast was removed at the end of two months. The patient walked at three months and has never had any further trouble with the ankle. The x-ray taken at the end of five and a half months shows the lesion healed After ankylosis of the ankle joint it is surprising how much sub-astragaloid motion compensates for the normal movement of the ankle. As a matter of fact this patient walks with practically no limp.

The unusually short time elapsing from the time of operation to the clinical cure makes it of interest to inquire into the modus operandi of healing. Was the absolute fixation alone responsible for the quick resolution or did the bone graft placed in the tuberculous area exercise a beneficient

and stimulating influence over the tuberculous process? I believe that both factors were contributory.

It is hardly necessary to add that this operation should be done under the most rigid asepsis, for to turn a tuberculous joint into a septic osteomylelitis would be disastrous.

By the use of a sterile stocking put on the foot after the skin is sterilized I have found that one can maintain a "no skin contact," and yet not obscure the anatomical landmarks. The stocking is wet with biniodid solution after being fitted on the foot, and the incision made through the stocking. In any operation on the foot requiring particular care this stocking technic will be found most convenient. When we protect our skin in the usual way by clamping towels to the skin margin we make it difficult in the case of a small limb to keep in mind our anatomical relations which are necessary to insure carpenter-like accuracy.

DISCUSSION

Dr. H. P. Mauck, Richmond, Va.—There are a few points which naturally come up in regard to this bone and joint surgery.

First, in regard to the reductions of the dislocations at the elbow. I should like to ask Dr. Skinner what his observations have been in regard to the removal of the head of the radius in children. In my experience in cases observed over four or five years, all these cases get a "knock-kneed" deformity at the elbow. Of course it is at times necessary to remove the head of the radius, but at the same time I think a good many of these dislocations can be reduced without removing the head of the radius and thus this deformity may be prevented.

In regard to the arthroplasty, I disagree with the author. What we want is to get a stable and at the same time a mobile, joint and we cannot get a stable joint simply by a fibrous union of the neck. I believe that a great deal of the difficulty in the interposing of fat and fascia flaps can be obviated by making a large U-shaped incision, from which you take your fat and fascia flap carefully curving it in such a manner that it can be thrown around the edge of the muscle flap.

I should like to ask if Dr. Skinner uses a muscle flap between the bones instead of the fat and fascia flap.

In regard to tuberculosis of the ankle, of course, we know that we can usually eliminate tuberculosis if we can get the joint fixed. I think the bone graft is the ideal fixation and probably the improved blood supply that takes place to the joint through the graft is of great benefit. I am not satisfied that such a bone graft as shown, is beneficial where the subastragalar joints are involved. The bone graft must extend below the astragalus.

Dr. Skinner (closing.—In regard to disabling deformity after excision of the head of the radius I have seen quite a number of radial heads removed for fracture with no impairment of function.

Anthroplasty has been talked about a great deal and some of us think that it is a modern procedure, but it is not. Thirty years ago, Gluck, after resecting ankylosed joints interposed ivory joints between the bones. At a later date gold foil was used in the joints, but it was left to Dr. John B. Murphy to give us the name "arthroplasty," and to stress the value of the interposition of fascia. In his writings he also made us believe that fascial transplants formed a new synovial membrane.

Most men will agree that it is not because of the peculiar virtue inherent in fascia or in any of the other materials that have been used; but the chief effect is the mechanical one due to the material that prevents the bones from growing together. In the case of the hip the results I have had with muscle are better than with the fascial flap because the anatomy of the hip joint affords us a much better muscle flap than it does a fascial flap.

I think that the bone graft in the tuberculous joint has a value exceeding that of mere fixation. I do not think in the case under discussion that we would have obtained the splendid osseous repair if the graft had not, per se, been responsible for an unusual osteogenesis. The reason we have not inlaid grafts through tuberculous joints was because we have been afraid to risk wound sepsis and possible aggravation of the disease.

Dr. Mauck doubts the value of the graft in subastragaloid tuberculosis. The grafting technic that I have shown is not to be considered in subastragaloid disease, but only for disease in what we commonly call the ankle joint, namely, the articulation between the tibia and the astragalus.

TREATMENT OF FRACTURES AND DISLOCATIONS*

By F. G. Hodgson, M.D., F.A.C.S.,
Atlanta, Ga.

In order that patients with fractured or dislocated bones may get the best possible end results, in the shortest time, and with the least discomfort, they should be treated from beginning to complete recovery by a bone specialist or orthopedic surgeon for the following reasons:

Better acquaintance with the anatomy and functions of bones, muscles and joints. The orthopedic surgeon, by his training

*Read in Section on Orthopedic Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.