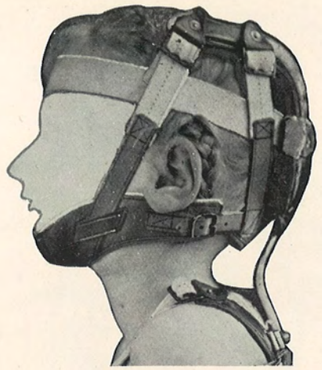


FIG. 1.

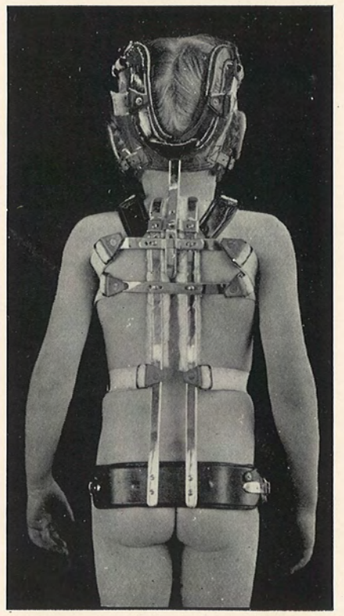


FIG. 2.

TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, May 7, 1900.

The President, DE FOREST WILLARD, M.D., in the Chair.

I. AN IMPROVED BRACE FOR HEAD EXTENSION. II. A HARD RUBBER SPRING BRACE FOR LATERAL CURVATURE.

BY JOSEPH M. SPELLISSY, M.D.,

SURGEON TO ST. JOSEPH'S AND THE METHODIST HOSPITALS; ASSISTANT SURGEON TO THE ORTHOPÆDIC HOSPITAL AND THE ORTHOPÆDIC DEPARTMENT OF THE UNIVERSITY HOSPITAL; SURGEON TO THE OUT-PATIENT DEPARTMENT OF THE PENNSYLVANIA HOSPITAL.

THE pieces of apparatus herewith described were devised during my service with Dr. Willard at the University Hospital. It is through his courtesy that they were made at the University Hospital machine shop.

I. BRACE FOR HEAD EXTENSION.

Theoretically, the ideal splint for a kyphotic tending spine is recumbency; but even cases that have enjoyed it with advantage must, finally, become ambulant with mechanical support, and this in highly located lesions must extend to the head. Next to recumbency, extension by suspension is most effective in combating a kyphotic tendency.

The jury-mast is an efficient exponent of the suspension principle, but patients complain that it is unsightly, and it permits lateral motion, which is sometimes undesirable.

The Taylor head-piece operative through extension by

means of a chin-cup is not sufficiently convenient in adjustment to insure modification daily, and the degree of extension obtained is far short of suspension.

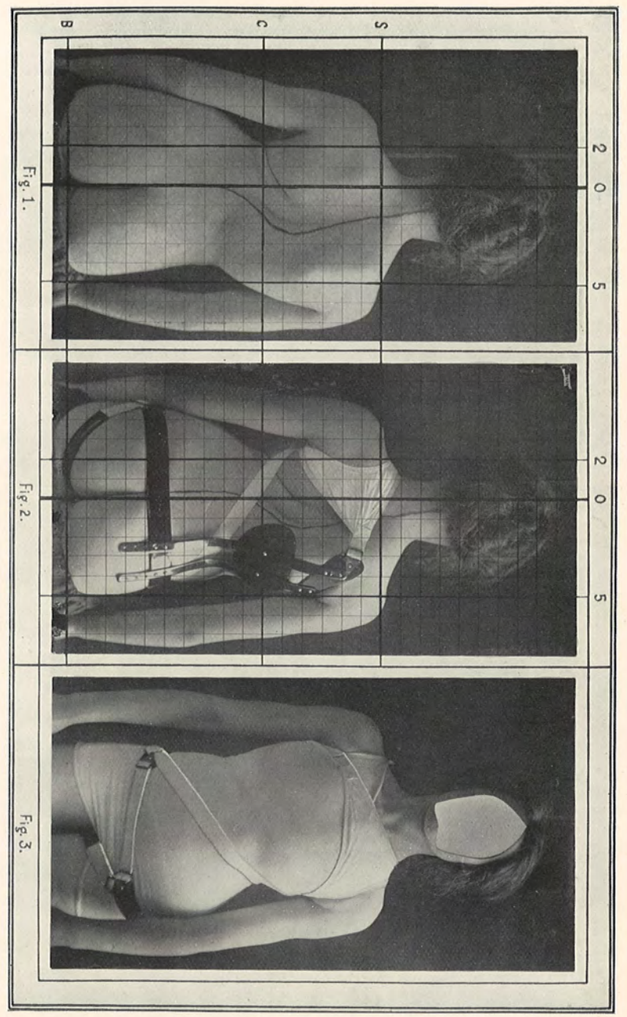
The Goldthwaite head-piece does not apply suspension or extension. It is a thorough posterior splint of the head and spine and it prevents lateral motion.

Suspension as complete as that of the jury-mast, but more controllable, convenient, and sightly, and also splinting as rigid as that of the Goldthwaite apparatus, is obtained in the adaptation of jury-mast and Taylor and Goldthwaite head-pieces described and illustrated below. (See Figs. 1 and 2.)

A keeper and a sliding-bar fastened by a set-screw similar to the device for the adjustment of the Taylor chin-cup are fastened at the top of the uprights of a Taylor spine-brace. The sliding-bar, however, instead of supporting a chin-cup, bifurcates at the occiput into two padded uprights, against which the head may be strapped by a webbing band passing round the brow and fastened by a buckle on each upright as in the Goldthwaite head-piece; but the uprights now take on the character of a double jury-mast. They turn at right angles and go horizontally forward, not above the head but loosely round it, on a level with the angle of the parietal bone, and they stop a little in advance of a vertical line through the anterior margin of the ear. These horizontal extensions of the uprights each have two buckles, which receive the webbing straps of an ordinary leather suspension-bridle or head-piece.

The brace is fixed below by the pelvic band, which grips the hips below the anterior superior iliac spines. Therefore, when the webbing straps of the head-piece are tightened, extension is applied to the spine between the pelvis and the chin and occiput. This extension is by suspension, and its degree is necessarily adjusted to the patient's need, at least, each time the brace is applied. Although webbing wears out more rapidly, it is preferable to straps with punched buckle-holes because permitting more perfectly graduated adjustment.

The webbing band round the brow—to limit lateral motion—should be adjusted last, otherwise it would interfere with the adjustment for extension.



FIGS. 1, 2, 3.—Photographs of a case of lateral curvature wearing (Figs. 2, 3) the hard rubber brace. The photographs were taken at the same distance and focus and at one standing. In Figs. 1, 2, the line O is the normal vertical median line, and it cuts the lowest point in the internatal crease, the base line B cuts the lowest border of the right gluteal crease. The degree of lateral correction effected by the brace is most easily appreciated by contrasting in Figs. 1, 2 the parts cut by lines 2, 5. The spinal curve is seen to be reduced by a little more than one-fifth, the deformity of the right lateral border of the chest by three-fourths, while that of the left side is only improved one-eighth. The gain in stature may be noted by observing the parts cut by the lines C and S.

This brace head extension was devised by me two years ago, and I have found it satisfactory for cases of cervical and high dorsal Pott's disease.

Dr. G. G. Davis, I have recently discovered, reported some five years ago a somewhat similar device, to which mine may be a duplicate, although independently conceived.

II. Hard Rubber Spring Brace for Lateral Curvature.

Cases of lateral curvature may be roughly divided into those treated by exercises alone and those treated by exercises and a brace. The brace is used in some cases as a reminder for patients who habitually revert to a vicious posture as soon as they escape from supervision, and braces are employed for others because the degree of deformity is gross.

The brace I exhibit is designed for the first class of cases. It was suggested by the spring bow-leg brace. A pad is placed over the deformity and is fastened to two convexly bent springs. When the ends of the springs are brought close to the body, considerable pressure is made on the deformity. A pelvic band and perineal strap hold the spring fast below, the pad is applied to the posterior deformity, and the upper end of the double spring is buckled in place by a strap passing round the opposite shoulder and side of the neck. As is seen (Fig. 2), considerable correction is effected in this way, and an indolent or forgetful patient is kept straighter.

[The brace is made of 18 gauge (about $^1/_{16}$ in.) untempered sheet steel coated with hard rubber. The spring characteristic depends entirely upon the rubber coating. By gently heating over a gas jet, the springs may be bent so as to make them stronger or weaker as occasion requires. The cleanliness, durability, freedom from rust, and the adjustability of the hard rubber truss, suggested the use of the same material for the brace now described.]

CASES OF COMPOUND OR COMPLICATED FRACTURE ILLUSTRATING THE VALUE OF OPERATIVE INTERFERENCE IN THE TREATMENT OF THESE INJURIES.

By HENRY R. WHARTON, M.D.,

SURGEON TO THE PRESBYTERIAN AND CHILDREN'S HOSPITALS; CLINICAL PROFESSOR OF SURGERY IN THE WOMAN'S MEDICAL COLLEGE.

Compound Dislocation and Fracture of the Lower End of the Tibia, with Fracture of the Fibula.—M. L., aged forty-five years, while standing upon the step of a shifting engine, was thrown off and struck the track violently, his weight coming upon the right foot, producing a fracture of the internal malleolus, with a compound inward dislocation of the tibia at the ankle, and a fracture of the fibula about two inches above its lower extremity.

He was brought to the Presbyterian Hospital, and I examined him soon after his admission, when I found the lower end of the tibia protruding from a ragged wound in the skin at the inner side of the ankle; the internal malleolus was separated and broken into several fragments, and was still attached to the internal lateral ligament. The astragalus was not fractured. The posterior tibial artery and vein were not injured. The wound was slightly enlarged to obtain a clear view of the parts. In view of the good circulation in the foot, I decided to resect the lower end of the tibia and a portion of the astragalus. About an inch and a half of the tibia and a portion of the astragalus were removed. The fibula was not resected, as it was found possible to bring the foot into its normal position in regard to the leg, the oblique fragments of the fibula slipping by each other, thus producing a compensating shortening. All loose fragments of bone were removed, the wound was irrigated with bichloride solution, a large drainage tube was introduced, the wound was partially closed by sutures, and a copious gauze dressing was

applied. The limb was next placed in a posterior binder's-board gutter splint, which was secured by a bandage, and for additional security was placed in a fracture-box. The wound was dressed on the fourth day and was found to be in good condition, and a plaster-of-Paris bandage was applied and trapped over the region of the wound. The patient did well after the operation, but healing was somewhat slow, as the wound was primarily infected and did not run an aseptic course. At the end of six weeks the patient was able to go about on crutches, and in a few months was able to walk upon the limb with comfort. The patient now has resumed his work as a switchman, and walks without a limp, and has good motion in the injured ankle.

This case represents a class of cases which many of us can remember as most unfortunate ones, before the modern methods of wound treatment had been adopted. It was formerly the rule in these cases to subject such cases to immediate amputation, for experience had proved that a more conservative method of treatment was usually followed by diffused abscess, septicæmia, spreading gangrene, pyæmia, and death; and only in exceptional cases was secondary amputation of the limb at a higher point able to save the life of the patient.

Compound Comminuted Fracture of the Tibia and Fibula.—X., aged fifty years, was admitted to the Presbyterian Hospital suffering from a compound fracture of the tibia and fibula caused by the kick of a horse. I saw this patient shortly after his admission, and upon examination of the injured limb was struck by the great amount of shortening and the great increase in the circumference of the limb in the region of the injury. There was a ragged wound over the front of the leg about midway between the knee and ankle.

The patient was etherized, and after the leg had been shaved and sterilized as far as possible, the wound was enlarged upward and downward in the line of the tibia, and it was then found that a fragment of the tibia, about three inches in length, occupied a transverse position between the ends of the fractured bone, its only attachment to the living tissues being by muscular fibres of the flexor longus digitorum and the interosseous membrane. There were also present in the wound a number of good-

sized separated fragments of bone. The fibula was also fractured near the seat of the tibial fracture. The anterior and posterior tibial arteries were found on examination to pulsate freely at the ankle. The vascular supply of the limb below being unimpaired, I decided to fix the upper and lower fragments to the large bone fragment of the tibia, and thus diminish the extensive shortening which would follow its removal, and make an attempt to save the limb. By making extension and by manipulation at the same time, I was able to fit the separated fragment between the separated ends of the tibia. I next removed a number of completely detached fragments. The large fragment was next fixed in position by a strip of perforated silver plate, secured by silver screws to the upper, lower, and intermediate fragments. When fixation was secured in this manner, it was found that the fragments of the fibula were in good position, so that no attempt was made to fix them. Several drainage tubes were introduced, and the wound was partially closed by sutures. A copious sterilized gauze dressing was applied and the limb was put up in binder's-board splints and placed in a fracture-box. The latter splints were changed in a few days, and a fenestrated plaster-of-Paris splint was applied. The patient did well, although there was some suppuration in the wound, and finally recovered with a useful limb, with a very moderate amount of shortening.

The result in this case was satisfactory to me, as in my experience it was the largest semidetached fragment which I have ever seen fixed to surrounding fragments and retain its vitality. Examination of this patient some months after he had left the hospital showed that union was only moderately firm between the upper end of the tibia and the detached fragment, and the patient was still using crutches. The application of a brace will permit the patient to use the limb, and will at the same time probably strengthen the union at this point.

Fracture of the Fibula with Marked Displacement of the Lower Fragment.—R., aged twenty-three years, while riding a bicycle, was struck by the fender of a trolley-car and sustained a fracture of the left fibula, about two and a half inches above its lower extremity, and a fracture of the internal malleolus of the tibia, with great contusion of the soft parts. I saw the patient,

with Dr. Hermann Allyn, on the day after the injury, and found the above-described injuries. The limb had been placed in a fracture-box, and the fragments seemed to be in good position.

Ten days after the injury, when the swelling had somewhat subsided, Dr. Allyn notified me that there was a marked deformity in the region of the fibular fracture, and I again saw the case with him. On examination, I found that the upper end of the lower fragment of the fibula projected upward, well above the lower end of the upper fragment; and although it was possible to partially reduce the deformity by manipulation, as soon as the reducing force was removed the deformity recurred. Finding it impossible to permanently correct the deformity, I advised that the fracture be exposed, and that the fragments be fixed in their proper position by a silver-wire suture or silver plate.

The patient was etherized, and an incision was made over the seat of the fracture. Upon exposing it, a strip of muscular tissue, probably from the peroneus tertius, was found between the ends of the fragments; this was displaced, and the ends of the upper and lower fragments were drilled, and a heavy silver-wire suture was introduced and secured, holding the fragments in good position. The wound was closed without drainage and a gauze dressing was applied, and the limb was put up in moulded binder's-board splints; these were taken off in ten days, and the superficial sutures were removed, as the wound was healed. A plaster-of-Paris bandage, including the foot and leg, was then applied, and this was removed at the end of six weeks, as firm union was present at the seat of fracture.

In a large number of fractures of the fibula which have come under my observation, I have never before seen a similar deformity, and from the conditions found to exist at the seat of fracture it is not possible that the deformity could have been remedied or satisfactory union could have occurred other than by operative interference.

Fracture of the Lower End of the Fibula with Fracture of the Internal Malleolus of the Tibia, with Marked and Persistent Deformity.—J. G., aged fifty years, received a fall in stepping from the pavement to the street and sustained a fracture of the right fibula about two and a half inches above its lower extremity,

and at the same time a fracture of the internal malleolus of the tibia. He was seen a short time after the accident by Dr. William E. Hughes, who asked me to see the case with him. Upon examination, we found the fractures above described, and at the same time there was such marked eversion of the foot that the edge of the tibia seemed about to protrude through the skin. The foot was also very much flexed by the action of the muscles inserted into the os calcis through the tendo-Achillis. All attempts to reduce the deformity were unavailing, so that an anæsthetic was employed; the reduction was then accomplished, and the limb was put up in binder's-board splints. At the next dressing of the case it was found that as soon as the splints were removed the deformity immediately recurred in as marked a degree as before, and could not be reduced until an anæsthetic was given. The greater the force employed to correct the deformity the greater was the muscular resistance offered.

As the deformity seemed to be largely maintained by the muscular force exercised through the muscles inserted into the os calcis through the tendo-Achillis, I decided to do a tenotomy of the tendo-Achillis, and then, having corrected the deformity, apply a plaster-of-Paris bandage. The patient was etherized, the tendo-Achillis was divided subcutaneously, and the deformity was then reduced without difficulty. The malleolus was well padded with cotton, and the foot was held in a position of over-correction while a plaster-of-Paris bandage was applied. This bandage was retained for four weeks and was then removed, and the fragments were found to be united in good position; a light plaster bandage was then applied and worn for a few weeks longer, and when this was removed the patient was allowed to use the limb in walking, and the result was entirely satisfactory.

I have resorted to tenotomy of the tendo-Achillis in several cases of fracture of the tibia and fibula occurring in the lower parts of the leg, where it was found impossible to correct an anterior displacement of the upper end of the lower fragment of the tibia by other means; but this is the first case of Pott's fracture in which I have found it necessary to resort to this procedure to obtain a satisfactory correction of the deformity.

Comminuted Fracture of the Upper Extremity of the Humerus; Excision of the Shoulder-Joint with a Useful Arm.—J. B., aged fifty-five years, was admitted to the Presbyterian Hospital, having received a fall from a cherry-tree, striking the ground with his right shoulder. Upon examination of the right shoulder shortly after his admission to the hospital, I found great swelling of the soft parts in the region of the right shoulder, and a comminuted fracture involving the humerus in the region of the shoulder-joint; the shaft of the humerus was drawn upward, and apparently was completely separated from the head of the bone, and one sharp edge of the humerus had perforated the deltoid muscle and could be felt projecting almost through the skin. It was found impossible to reduce this deformity without the aid of an anæsthetic; this was given, and the deformity was reduced, and the arm was put up in a Ferguson dressing. The next day, upon removing the dressing, it was found that the deformity had recurred, and that the skin was in great danger of perforation by the sharp end of the lower fragment of the humerus.

Dr. Willard saw the patient with me, and we decided that it would be wise to cut down upon the fracture and fix the fragments by sutures if possible, to prevent a recurrence of the deformity. I explained to the patient that, if it was found impossible to fix the fragments by sutures, his best chance of a useful arm would follow an excision of the head of the bone, and obtained his consent to do what we considered best at the time.

The patient was etherized, and the seat of the fracture was exposed by an incision; it was found that there was marked comminution of the upper extremity of the humerus, which also extended to the head of the bone, so that it was impossible to fix the shaft of the humerus to the head of the bone by sutures. This condition existing, I proceeded to excise the head of the bone, and also resected a portion of the end of the shaft of the humerus, so as to furnish a smooth surface to articulate with the glenoid cavity. The wound was drained and closed by sutures, and a copious gauze dressing was applied; a wedge-shaped pad of sterilized cotton was placed between the arm and body, with the base of the wedge at the elbow, so as to bring the end of the humerus as nearly as possible in relation with the glenoid cavity.

The arm was then fastened to the side of the body by the turns of a bandage.

The wound ran a perfectly aseptic course and was firmly healed in a few weeks; the patient did well except for an attack of pneumonia, which prevented his leaving his bed for some weeks. When he recovered from this attack, he was allowed to go about with his arm in a sling, and was encouraged to use it as much as possible. When last seen, some months after the accident, he had good use of the arm.

In comminuted fracture involving the neck and shaft of the humerus, and in fractures of the neck of the humerus with displacement of the head of the bone, where it is often difficult or impossible to replace the dislocated head of the bone, I believe that much better functional results would be obtained if excision of the joint was more generally resorted to.

Extensive Gunshot Wound of the Shoulder-Joint; Excision of the Joint, with Recovery with a Useful Arm.—C. E., aged sixteen years, was admitted to the Bryn Mawr Hospital in December, 1899, having received an extensive gunshot injury of the left shoulder. In climbing a fence with a gun in his hand the weapon was discharged, and the charge of No. 7 shot entered the tissues just above the anterior fold of the axilla, passed backward and upward, and emerged just above the spine of the scapula. Upon examination of the patient I found an oval lacerated wound just above the anterior edge of the axilla, and upon passing my finger into the wound I discovered that the upper part of the shaft and head of the humerus were extensively comminuted, and also that the acromion process was separated from the scapula; the deltoid muscle was extensively lacerated, the axillary vessels were uninjured, and the circulation in the arm and forearm was unimpaired. In view of the non-involvement of the blood-vessels in the injury, I decided to remove the comminuted fragments of bone, resect the end of the shaft of the humerus, and excise the head of the humerus.

The patient was etherized, and the anterior and posterior wounds were enlarged by incision, and a number of loose fragments of bone were removed; a portion of the head of the humerus which still remained in the glenoid cavity was also removed.

The upper end of the shaft of the humerus was turned out of the wound and sawn off, so as to give a smooth surface for articulation with the glenoid cavity. The separated acromion process was fastened to the scapula by a heavy wire suture. A large drainage tube was passed through the anterior wound and brought out of the posterior one, and some sterilized gauze packing was also introduced to control the venous hæmorrhage, which was quite free. The anterior wound was next partially closed by sutures and a copious gauze dressing was applied; a wedge-shaped pad of sterilized cotton was placed between the arm and the body, with the base of the wedge at the elbow, and the arm was then securely fastened to the side.

The subsequent history of the case was uneventful, and the patient was discharged from the hospital with fair motion of the arm at the shoulder.

Dr. Branson, who had charge of the patient after the operation, states that he has seen him recently, and that the result is an excellent one.

Examination of the injured arm five months after the injury shows that the wounds are healed, and that the patient has free motion at the shoulder-joint; the most marked disability being shown in lifting the arm, which is accounted for by the great wasting of the deltoid muscle; this condition is probably largely due to destruction of the muscle itself as well as to the injury of the circumflex artery and nerve at the time of the accident.

DISCUSSION.

Dr. Huntington, of San Francisco, said that through the kindness of Colonel Girard, Chief Surgeon at the United States General Hospital at San Francisco, he had been able to inspect a large number of gunshot fractures, and had been deeply impressed by this consideration,—that a very considerable amount of loss of tissue may be sustained without succeeding material deformity after repair has taken place, or, in other words, a large amount of interspace may be expected to be filled in efficiently during the process of repair. He recalled one case in which a Mauser bullet carried away nearly one-half of the femur for a distance of two and one-half inches, fracturing the bone completely. The remaining portion of the bone was comminuted, so

it was doubtful if there were more than two-fifths of the circumference of the femur which were brought into apposition with its opposing fragment. In that case the result, after some four months, was almost perfect.

Dr. James E. Moore, of Minneapolis, said that plaster of Paris was in great favor with the Western surgeons as a fixation agent. Where the patient is under the immediate control of the surgeon the plaster of Paris is not infrequently applied at once. Where he is not under immediate control, or where he is not seen immediately after the accident and until after swelling has taken place, he is cared for very much as he had seen them cared for in the hospitals in Philadelphia, until the swelling has gone down, then the plaster-of-Paris dressing is applied. There is no question but that the operative treatment in many cases of fracture is the only proper treatment. One of his colleagues at the present time was making a series of experiments bearing upon the possibility of injury to the nerve supply of some of the long bones as a causative factor in non-union or delayed union. His experiments, however, are not yet complete, although he has given verbally some very strong evidence pointing towards that as a cause for non-union.

Dr. Wharton remarked, with reference to the case of comminuted fracture in which a large fragment had been retained, that in many cases of comminuted fragments he would have removed them all and have gotten marked shortening, but here, where he had one large fragment, he thought he could reduce the shortening by wiring, and he felt justified in making the attempt. He thought that in this case he would eventually get a useful limb by having a plaster-of-Paris bandage put on, and allowing him to go around as they do in the ambulant treatment; that is, by walking in the plaster bandage, or by having the brace adapted so that a certain amount of weight can be brought to bear on the limb and a certain amount taken off the limb at the seat of fracture by means of the brace.

With regard to the method of fixation in compound fractures, he was not at all wedded to the silver plate. In the larger number of compound fractures in which he secured fixation by suture, it was by means of heavy silver wire. By applying more than one heavy silver-wire suture one can get as good fixation as by the silver plate. In using the plate, the screws, unless very carefully

made, are apt to have the heads turn off or split. A mistake in using the silver wire is in not using it heavy enough in order to stand a certain amount of strain.

With regard to the question of compound fractures involving the joints, he agreed with Dr. Allis that in a majority of cases the functional result would be better if operative methods were adopted. He was not able to agree with him as to the advisability of operating in patients suffering from intracapsular fractures of the femur, for such operations would be followed by a very heavy mortality; but in younger patients, and in some other joints, operation would be followed by much better results as regards the function of the limb.

INSTRUMENT FOR FACILITATING THE ANASTOMOSIS OF HOLLOW VISCERA.

Dr. M. O'Hara, Jr., presented a new forceps for use in intestinal anastomosis, describing them and their use in a paper.

A METHOD OF PERFORMING ANASTOMOSIS OF HOLLOW VISCERA BY A NEW INSTRUMENT.

By M. O'HARA, Jr., M.D.,

GYNÆCOLOGIST TO ST. AGNES HOSPITAL; ASSISTANT SURGEON TO GYNECEAN HOSPITAL, AND CHIEF OF SURGICAL CLINIC AT THE MEDICO-CHIRURGICAL HOSPITAL.

A THOROUGH appreciation of the responsibility one takes upon himself when he offers something that differs from the procedures that are in vogue, has prompted me to use every endeavor to find wherein this instrument which I present was weak. I am pleased to state to you, however, that if an error exists in its application I have been unable to find it. I have met with results of the most satisfying character in all of my experimental work on the lower animals. Basing my assumption upon the knowledge thus obtained, I unhesitatingly offer these forceps to the profession, confidently feeling that, if the forceps are used as they should be, they will win the same confidence in the hands of others that they have in mine.

My experimental work has gone on for the past nine months, and I can state that I have found the forceps in their application to possess advantages not to be found in any of the methods now in use. To briefly mention some of these advantages: First of all is the wide application of a single instrument: with the same instrument one may do a resection of the pylorus, of the cæcum, and of the small or large intestines. Anastomosis can also be performed on any of the hollow viscera, including the large and small intestines, stomach, and even intestines of unequal calibre; the various gall-bladder operations can also be performed. In fact, I cannot conceive any of the gastro-intestinal operations that cannot be performed by the use of this instrument.

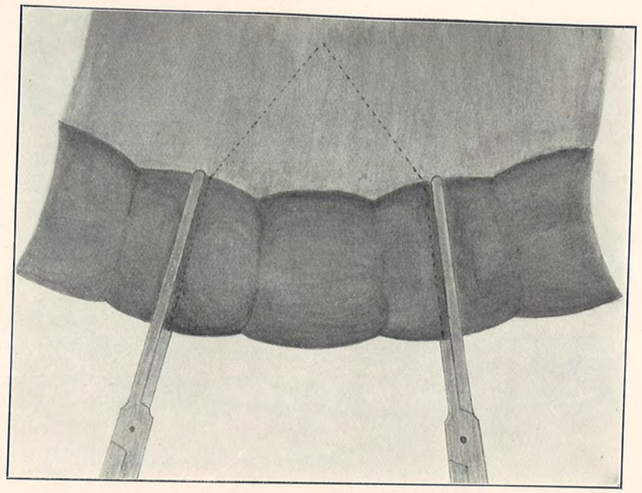


FIG. 1.—Showing the manner of placing forceps in resection of bowel; dotted lines show the incision to be made.

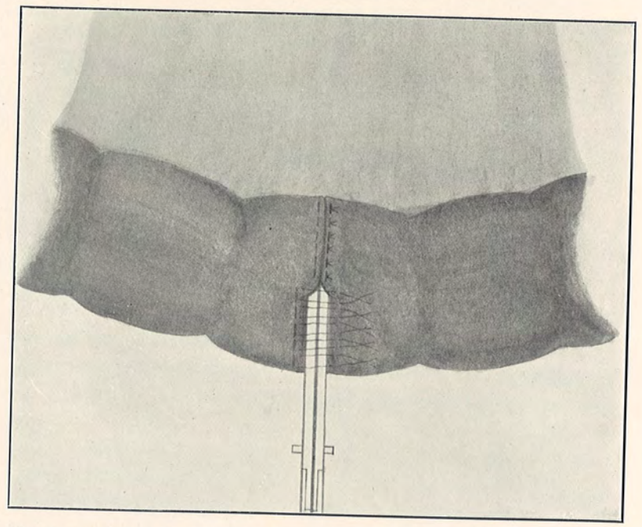


FIG. 2.—End-to-end anastomosis. Forceps brought together and held by serre-fine (not shown); sutures introduced, some of which are tied.

An exceedingly strong factor in favor of the forceps and method is the manner of closing off the bowel cavity at once; this is the first step in all operations where the forceps are employed, the bowel remaining closed until the very last moment; when the forceps are removed it is through a very small opening, an opening so small that it is under the thorough control of the operator; thus the dangers of fecal matter escaping into the peritoneal cavity are prevented.

Rapidity is an essential factor, where such rapidity does not sacrifice careful and accurate work. A method the speed of which is not at the expense of accuracy, is the only method one can consistently use in gastro-intestinal surgery, and it pleases me to say to you that the speed of my method has not been at the expense of accurate work.

In comparing this method with the Murphy button operation, it may take a moment or so longer; but I think the extra time spent in forceps approximation of the bowel is well spent when one considers the very decided advantages gained. It is certainly more surgically complete than leaving a foreign body in the intestinal canal, which causes no little anxiety until the patient has voided it.

Secondary stricture of the bowel is another important matter for consideration in this class of work. The dangers of this complication are reduced to the minimum in the method under discussion.

The calibre of the bowel is not impaired in the least degree, as the bowel is spread out to its fullest extent, without stretching, by the forceps before sutures are introduced. As to the amount of gut inverted, this, I think, causes no difficulty if it be within reasonable bounds, as in a very short time it undergoes an atrophy; in fact, in my dog work, I was surprised to find that this atrophy occurred in several cases to such an extent that in a week's time one could hardly find any trace of the gut that was inverted. In these cases I turned in about a half an inch, which was more than was required, and on examination a week later I could only find about a sixteenth of an inch projecting into the lumen of the gut.

I need not dwell upon the necessity for accurate suturing to obtain successful results in all bowel work. In comparing this method with some of the other artificial means to assist in suturing accurately, such as the inflatable rubber bags, all that is needed is for one to see the forceps used to be convinced of their superiority. A test that I have employed to satisfy myself of the accuracy of my suturing has been to tie one end of the sutured gut, place the other end on a faucet and turn the water on; if I had used ordinary care, no leakage would occur at the line of suturing, the stitches tearing out before any leakage would occur. This procedure is about as severe a test as one could employ, certainly in the human subject the strain is never so great as this.

To summarize the points of advantage claimed for this method:

(1) Reduction of the dangers of sepsis.
(2) Rapidity.
(3) Accuracy.
(4) Wide range of application.
(5) Simplicity.

These I would term the cardinal points to success in gastro-intestinal surgery as well as in gall-bladder surgery.

The instrument consists of two pairs of straight forceps, the jaws of which are very slender and two and a half inches long, for ordinary work; for special work they can be made longer. Instead of being roughened as in the ordinary hæmostatic forceps, they are grooved down the centre of one blade; the opposite one has a ridge, similar to a pile clamp; both forceps are held together by means of an adaptation of the serre-fine.

Method of doing a Resection, followed by an End-to-end Anastomosis.—The serre-fine clamp is removed, and one forceps is placed transversely across the bowel at the point selected to mark the upper border of the resection, and locked; the other forceps is placed in the same manner at the lower margin of the resection. The tips of each forceps should be on an exact line with the mesenteric attachment. Forceps are placed

Fig. 3.—Lateral anastomosis. Forceps applied in a line with the long axis of the gut.

upon the ends of the intervening portion of the intestines, to prevent any leakage from this source. Then with a pair of curved scissors or a scalpel cut the bowel rather close to the forceps, the incision being carried into the mesentery so as to remove a wedge-shaped piece, avoiding the wounding of any important vessels; if bleeding occur from any of the smaller vessels, a clamp can be placed on it temporarily.

The two forceps are then brought and held together by means of the serre-fine clamp, the sutures are then introduced, starting at the point nearest the lock of the forceps and carrying them down to the tips, where a little care should be exercised to get accurate apposition of the gut at its mesenteric attachment. I have found it necessary at times, where the mesentery was quite dense and broadly attached, to nick it with a pair of scissors and push it back to allow the bowel to turn in properly. If an interrupted suture has been employed, it is now necessary to tie before proceeding to the other side. The forceps are now turned over and the sutures are placed in the same manner, only they are started from the tips of the forceps, and are carried up until the level of the first suture has been reached. The forceps are now unclamped; one pair removed by unlocking and drawing out in a straight line; the other is unlocked and passed above and below the line of suturing within the canal of the gut to insure that both walls of the gut have not been included in any of the sutures. They are then withdrawn and the remaining opening closed by one stitch. If the operator desires it, he can now run a row of sutures to reinforce the first. The incision remaining in the mesentery is closed in the usual manner.

Method of doing Lateral Anastomosis.—The gut is picked up by means of a rat-toothed forceps, and one pair of forceps is applied in a line with the long axis of the gut. The tip must be on an exact line with the edge of the gut; the forceps includes just so much of the gut as the size of the mouth one intends to make; the other forceps is placed in the same manner, at the point where it is intended to make the other mouth, using care to pick up the same amount as in the first forceps;

this can be done by observing the graduated lines that are on the forceps. Then with a pair of curved scissors cut fairly close to the forceps and remove the gut that projects beyond the forceps; the forceps are now brought together and held by the serre-fine clamp. The sutures are introduced from the lock to the tips in the usual manner, using a little extra care on reaching the tips. The sutures are now tied and the forceps turned over; sutures are placed on this aspect of the gut from the tips towards the lock to the level of the first suture. The sutures are now tied and the forceps unclamped, one being removed, the other being unlocked and passed to each side of the line of suturing, to make sure that both walls of the gut have not been included in any of the sutures. This forceps is now removed and the small opening closed by one suture, and if it is desired, another row of sutures can now be placed to reinforce the first.

The mouth made after this method is one that is made by the removal of an oval-shaped piece of tissue, thereby lessening the possibility of secondary contraction. As to the size of the mouth, this can be made as large as the fancy of the operator may dictate.

In dealing with the open ends of the bowel, as is the case at times after lateral anastomosis, one pair of forceps is all that is required. It is placed as in the end-to-end operation and the bowel turned in upon itself and serous membrane stitched to serous membrane. This method is almost identical with that followed by Dr. Ernest Laplace, except that I place the tip of the forceps on a level with the mesenteric attachment; by so doing it is only necessary to place one stitch when the forceps is removed.

The forceps can be used to anastomose bowels of unequal calibre, as is the case in resecting the cæcum; by placing the forceps upon the large gut at the point it is desired to resect and on a corresponding point of the small gut, using care to place the forceps in such a manner that it corresponds to the point of desired entrance into the large gut; the forceps are then clamped together and the sutures passed from the small

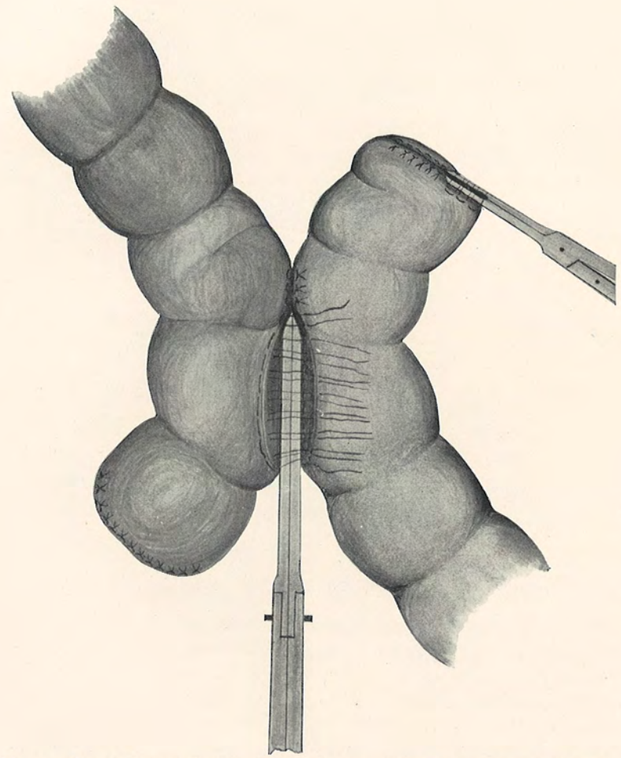


FIG. 4.—Lateral anastomosis. Shows forceps brought together and held by serre-fine (not shown); sutures introduced, some of which are tied. Also shows manner of placing forceps in invagination with sutures applied, some of which are tied.

to the large gut, and so continued until the small and large gut have been sutured on each side, when the forceps holding the smaller gut is removed. A suture is now placed with a little care to close that point where the small joins the large gut. The large gut is now sutured upon itself, as in the method of invagination. When all the sutures are in place and have been tied, the forceps are passed above and below the line of suturing of the small bowel, to be quite sure that the sutures have not included both walls of the gut; the small opening that remains is now closed, and if it is desired another row of sutures can now be placed to reinforce the first. The above method can also be applied to resection of the pylorus with little or no modification.

A practical point to which I might call attention is, that one should bear in mind, in placing the forceps, to place them in such a manner that they can be turned over readily without putting any traction on the gut.

In closing, I wish to thank Dr. H. D. Beyea for his assistance in helping me with illustrating the text. I wish also to acknowledge the debt of gratitude I owe Dr. Alfred Stengel for extending me the use of the Pepper Laboratory, where every facility was given me for carrying on my experimental work.

DISCUSSION.

Dr. Le Conte said that through the courtesy of Dr. O'Hara that day, he had used these forceps on a case of tubercular peritonitis which, after an operation a year ago, developed a fæcal fistula in the line of the incision. After freeing up the adhesions, he found the perforation in the bowel to be over two inches, necessitating a resection of the ileum. The rapidity and ease with which the forceps were used was surprising, and the time consumed in resecting the gut and making an end-to-end anastomosis was probably not over five or six minutes. He could fully bear out all the claims Dr. O'Hara made for the instrument, and he called attention particularly to the simplicity of the forceps, their easy application, and the impossibility of leakage while the anastomosis is being done.

Dr. Huntington said that he would hesitate to make end-to-end anastomosis between the small and large bowel by attempting to close a portion of the large bowel and then attaching the small bowel to the resulting aperture. There is a fault in that procedure that does not, however, minimize the value of the instrument. He personally did not approve of the metallic button, and believed, if accurate statistics of the operations done by the Murphy button throughout this country to-day could be furnished, surgeons would have a list of tragedies that would be appalling. He had used it fourteen times, and if he included one which was reported six days after the performance of the operation, and since he left home, as being probably a success, he had but two successes to record.

Dr. Davis remarked that the question of time in doing an anastomosis with this instrument as compared with that of the Murphy button had been raised. It seemed to him that it was perfectly easy to decide the relative time consumed by comparing the two procedures. In the first place, with the Murphy button, it is required to place the two ends in place and fix each with a purse-string suture. That would take probably longer than the clamping of these two forceps to the gut. In the second place, the Murphy button is usually reinforced by Lembert's sutures around the button. If that is done, then it is a question of surrounding the entire circumference of the gut by Lembert's sutures. That is all Dr. O'Hara does.

The gut being the same in both instances, the time consumed in applying the Lembert's sutures around the gut in both the Murphy button and these forceps would be approximately the same. Therefore, if the button was applied with a single row of sutures, and if Dr. O'Hara only used a single row of sutures in his operation, then it would appear that both operations could be done in the same time. In other words, it would take no longer to make the operation with Dr. O'Hara's forceps than it would take with the Murphy button reinforced with a single layer of Lembert's sutures.

TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, June 4, 1900.

The President, De Forest Willard, M.D., in the Chair.

TUBERCULAR PERITONITIS; RECOVERY AFTER ABDOMINAL SECTION; FÆCAL FISTULA.

Dr. Robert G. Le Conte reported the following case: An Italian woman, aged seventeen, was admitted to the Pennsylvania Hospital on December 15, 1898. She had complained for more than two years of abdominal pain, associated with increasing fulness and swelling of the abdomen, and accompanied by general debility and anæmia. Family history negative, and her previous history negative, except that she had always been pale and sallow. The abdomen was large and tense and filled with fluid. The heart, lungs, and urine were negative to examination. Two days after admission the abdomen was tapped and ninety-four ounces of clear, straw-colored fluid withdrawn. Slowly and gradually the fluid reformed in the abdomen, so that by February 6, 1899, she was again greatly distended. She was again tapped, and 220 ounces of clear fluid withdrawn, of 1020 specific gravity, and containing a few leucocytes. A blood count at this time showed red corpuscles 5,600,000, white corpuscles 50,000, hæmoglobin, 60 per cent. By February 25 the abdomen was again considerably distended. The patient was etherized and the abdomen opened in the median line below the umbilicus. The peritoneum was much thickened, and an encysted cavity, extending from the umbilicus to the uterus, was opened. This contained fluid and cheesy material. The intestines were densely adherent around the cavity and covered with tubercular nodules. These adhesions were broken up, the abdomen was irrigated and closed with drainage. Two days later the drainage tube was removed. The drainage