

DR. G. G. DAVIS said that this case was somewhat similar to one which came under his notice not long ago. The patient was a child 7 years of age, who, when about 3 years old was being circumcised. From some movement of the child the knife, which was lying on the abdomen, penetrated the thigh and wounded the femoral artery; a surgeon was called in and he ligated the femoral artery. About four years passed when the case came under his notice; it illustrates very clearly the effect of this condition on the growth of the limb. The size of the limb was very distinctly increased. The evidences of arteriovenous connection were very apparent; one could get the thrill and murmur and could see the pulsation approximately at the apex of Scarpa's triangle. The child is active, running about, but has a marked disproportion between the limbs, the injured one being three-quarters inch longer than the other, and one inch greater in circumference, showing the influence of this condition upon the nutrition. One would expect that the nutrition of a part was best carried on by the normal arrangement, but according to this case it would hardly seem so.

DR. JOHN B. ROBERTS said that it had long seemed to him that the nomenclature of this condition was bad. We say arteriovenous aneurisms or aneurismal varix and varicose aneurism. Years ago he suggested that it would be much better if they were called arteriovenous fistulæ. Simple arteriovenous fistula and sacculated arteriovenous fistula were the names which he then suggested. There is a similarity to aneurism, but that term should be restricted to a tumor made up of coats of an artery.

STATED MEETING, HELD FEBRUARY 5, 1912

The President DR. GWILYM G. DAVIS, in the Chair.

ARTHROTOMY FOR ELBOW LUXATION.

DR. EDWARD B. HODGE exhibited a patient to show the result one year after arthrotomy for postero-external luxation of the elbow.

Male, 49 years of age, switchman, had his right arm amputated at the wrist following a crush 14 years ago. Six weeks before his admission to the Presbyterian Hospital, March 8, 1911, he fell from a freight car upon his left arm, injuring the elbow. There was swelling and disability. As the swelling lessened, he became able to use the arm, except bending the elbow. When admitted to hospital, the left elbow showed nearly full extension, flexion limited to 160 degrees. The olecranon was out of line with the condyles and to the outer side as well as posterior. The head of the radius rotated behind and below the external condyle. The X-ray confirmed the clinical diagnosis of postero-external luxation. It also showed several loose pieces of bone, chiefly in the region of the external condyle.

On March 10, under ether, several attempts at reduction failed. An external incision was then made, extending from above the external condyle down on the forearm. The muscles were separated from the region of the external condyle, and on retraction toward the median line a good exposure was obtained. The head of the radius, well posterior and behind the external condyle, showed a crack extending one inch down the shaft. A loose piece from the external condyle was removed. After much difficulty the bones were replaced, using the handle of an instrument as a lever. Muscles and ligaments were held in as nearly normal position as possible by chromic gut sutures. A cigarette drain was placed to the capsule, the skin closed with silkworm gut, and the arm dressed in acute flexion.

Convalescence was uneventful except for some numbness and tingling in the ulnar distribution. This is still present in

slight degree. There was discharge of synovial fluid for 10 days, but no infection. Passive motion was begun early, and on discharge one month after operation the patient had at least 75 degrees of motion and could easily touch the back of his head with the palm of his hand.

The reporter emphasized the excellent exposure obtained by the external incision in dislocations of this type.

RESULTS IN THE TREATMENT OF FRACTURES OF THE FOREARM WITHOUT OPERATION.

DR. ASTLEY P. C. ASHHURST presented a paper in which were detailed the results obtained by treatment without operation in 52 cases of fracture of the forearm.

By error this paper was bound up in Volume XIV of the Transactions of the Philadelphia Academy of Surgery (1911-1912, pp. 32-33.)

FRACTURE OF THE RADIUS ABOVE THE ATTACHMENT OF THE PRONATOR QUADRATUS MUSCLE.

BY EMORY G. ALEXANDER, M.D.,

OF PHILADELPHIA

Demonstrator of Fracture Dressings, Jefferson Medical College and Woman's Medical College; Assistant Surgeon, Kensington Hospital for Women; Surgeon to Out-Patient Department, Episcopal Hospital, and Children's Hospital, Mary J. Drexel Home.

IN reviewing the writings of the old surgeons, one is filled with admiration for their great work in the treatment of fractures. Their knowledge of the causes, deformities, action of muscles, manner of reduction and keeping reduced was truly remarkable. If these men could have had that valuable aid, the X-ray, in studying and treating their fractures, I am sure they would have handed down to the surgeons of to-day methods far in advance of those now in vogue.

In presenting this paper with accompanying X-ray plates, I hope to show that good approximation can often be obtained, if one will but persist and not be too hasty to resort to operative measures.

The following case is a fairly typical one of a fracture in this region. The patient was admitted to the Episcopal Hospital, to the service of Dr. H. C. Deaver, to whom I am indebted for the privilege of treating and reporting the case.

CASE I.—W. D., male, aged forty-one years. Ten days before admission, while at work, patient fell eight feet and as the result of direct force sustained a comminuted fracture of the radius above the attachment of the pronator quadratus muscle.

The attending physician, failing to get good approximation of the fragments, referred the case to the Episcopal Hospital for an operation.

The first X-ray showed the upper fragment abducted and

rotated outward and the lower fragment strongly pulled over toward the ulna.

The patient had been under the care of a very skilful physician, who had first treated the fracture in the usual semipronated position, with long palmar and short dorsal splints, and later on a Bond splint, without gaining a good approximation of the fragments.

We had made an internal angular splint (Fig. 1), somewhat pistol shaped at the wrist, so as to strongly adduct the hand, hoping through the action of the external lateral ligament, and possibly the cartilage and the carpal bones, to pull or force the lower fragment in position.

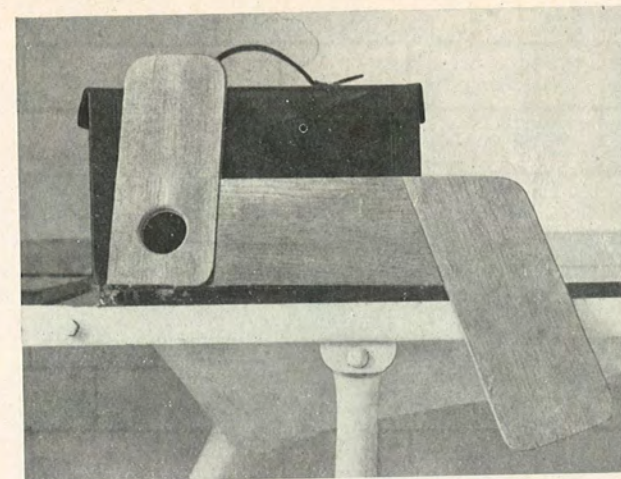
The X-ray of the bones in this position showed that our efforts had not been entirely successful (Fig. 2). The failure seemed to be due to the upper fragment, as this was not affected by the position or adduction of the hand. As the lower fragment seemed to occupy almost a normal position, our efforts at reduction were next directed to the upper fragment.

To overcome its deformity, the arm was placed on an anterior angular splint, likewise pistol shaped at the wrist (Fig. 3), and as in the previous dressing a short straight splint was applied posteriorly from the elbow to the wrist (Fig. 4). This changed the arm from a semipronated to a supinated position and relaxed the flexors of the forearm, thus producing one of the fundamental principles in the treatment of any fracture, muscular relaxation. It also supinated the lower fragment of the radius, bringing it in apposition to the upper fragment. The X-ray of the fracture in this position showed the bones to be in perfect alignment (Fig. 5). Fig. 6 shows end result.

As some difficulty had been encountered in gaining this approximation, and as the fracture had been frequently disturbed during the ten days prior to admission to the hospital, and as there was no attempt at union, the splints were left on for twelve days. During these twelve days the bandages were frequently removed, without disturbing the splints, which were held in place by adhesive plaster, the soft parts inspected and bathed with alcohol, and gentle passive motion given the fingers.

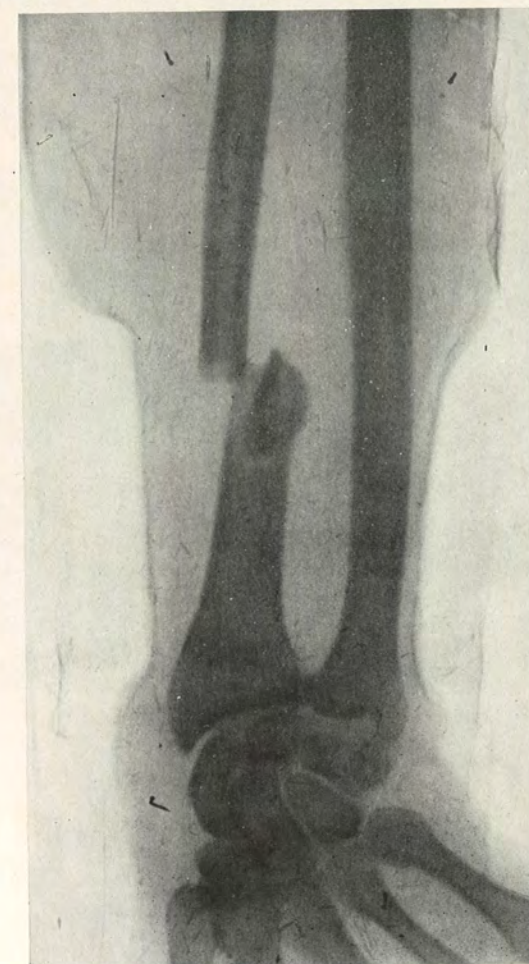
I believe this was unnecessarily long to keep the hand adducted, as a few days in this position would have been sufficient. At the expiration of the twelve days a short straight posterior

FIG. 1.



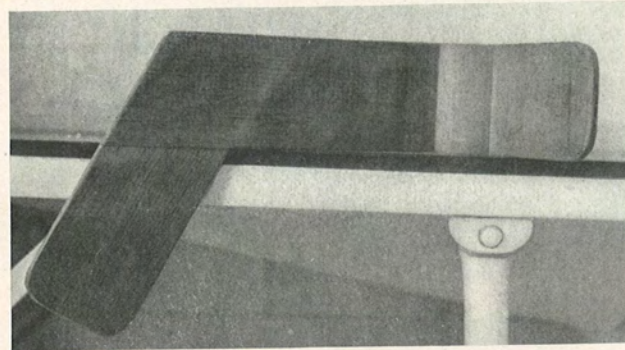
Internal angular splint to secure adduction of hand.

FIG. 2.



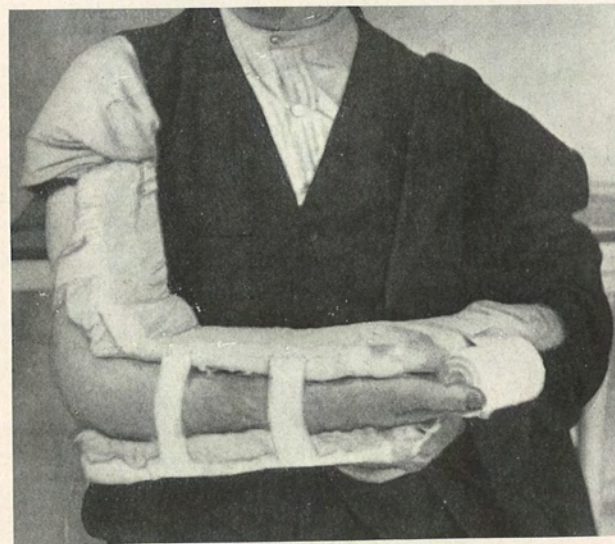
Arm on internal angular splint, pistol shaped at wrist; hand strongly adducted; deformity much improved.

FIG. 3.



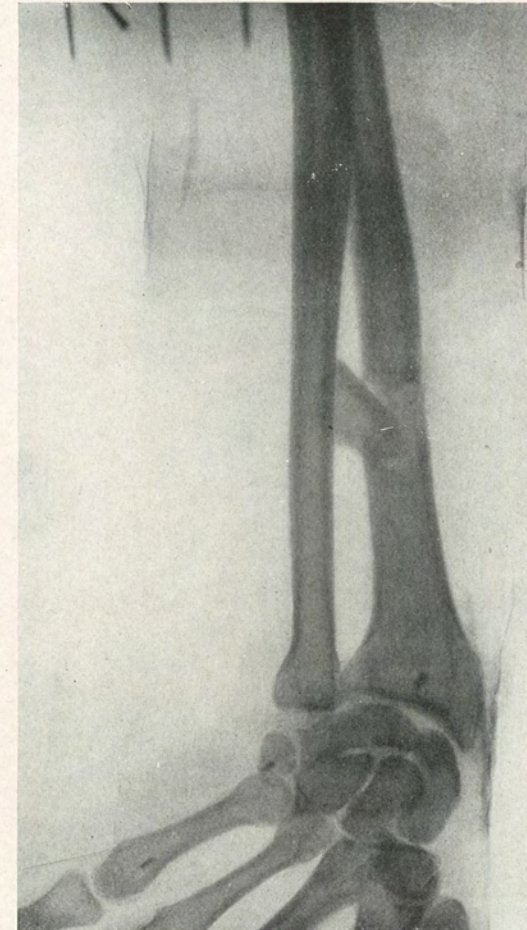
Anterior angular splint to procure adduction of hand.

FIG. 4.



Position of arm as shown in X-ray plate (Fig. 5).

FIG. 5.



Arm on anterior angular splint, pistol shaped at wrist; hand adducted; perfect alignment.

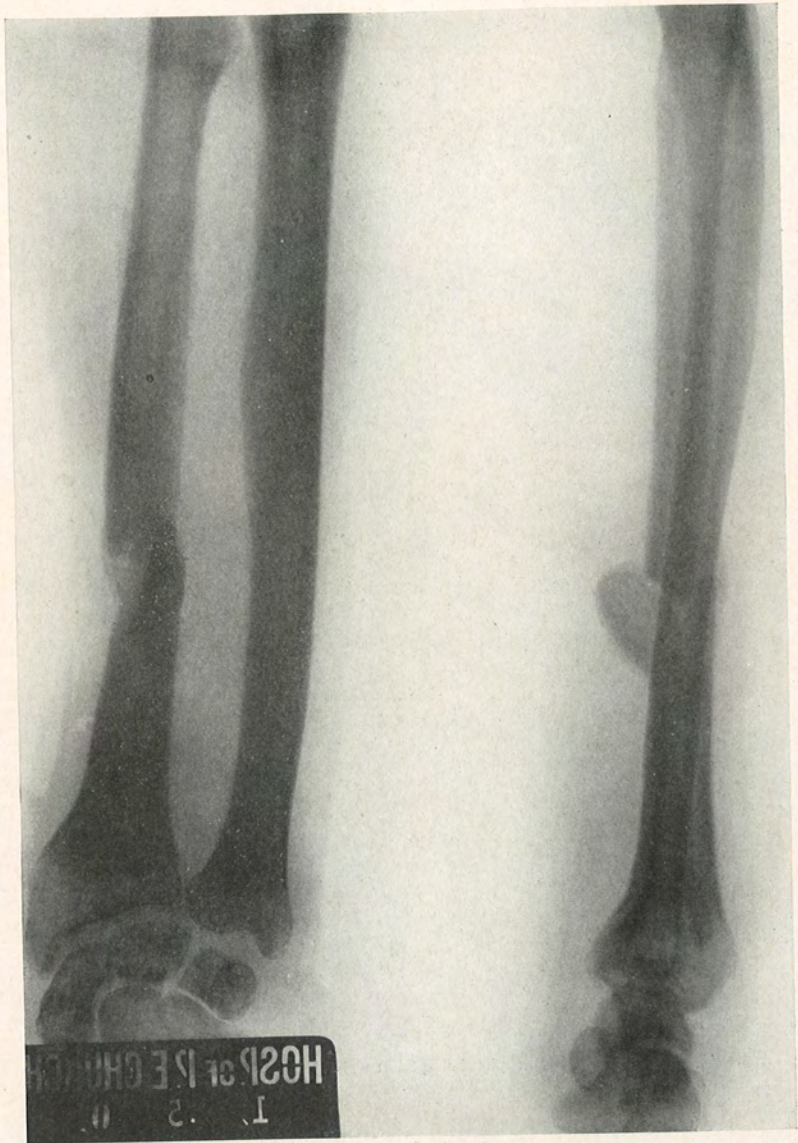


FIG. 6.

End result of Fig. 2.

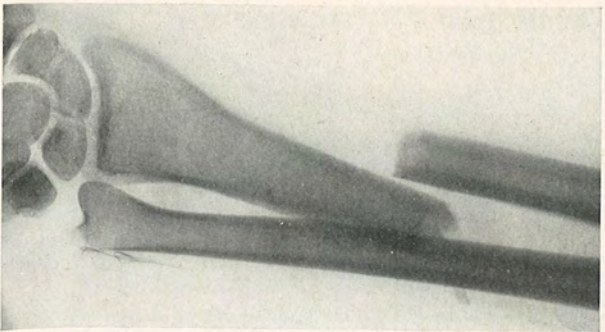


FIG. 7.

Fracture of radius with typical deformity.

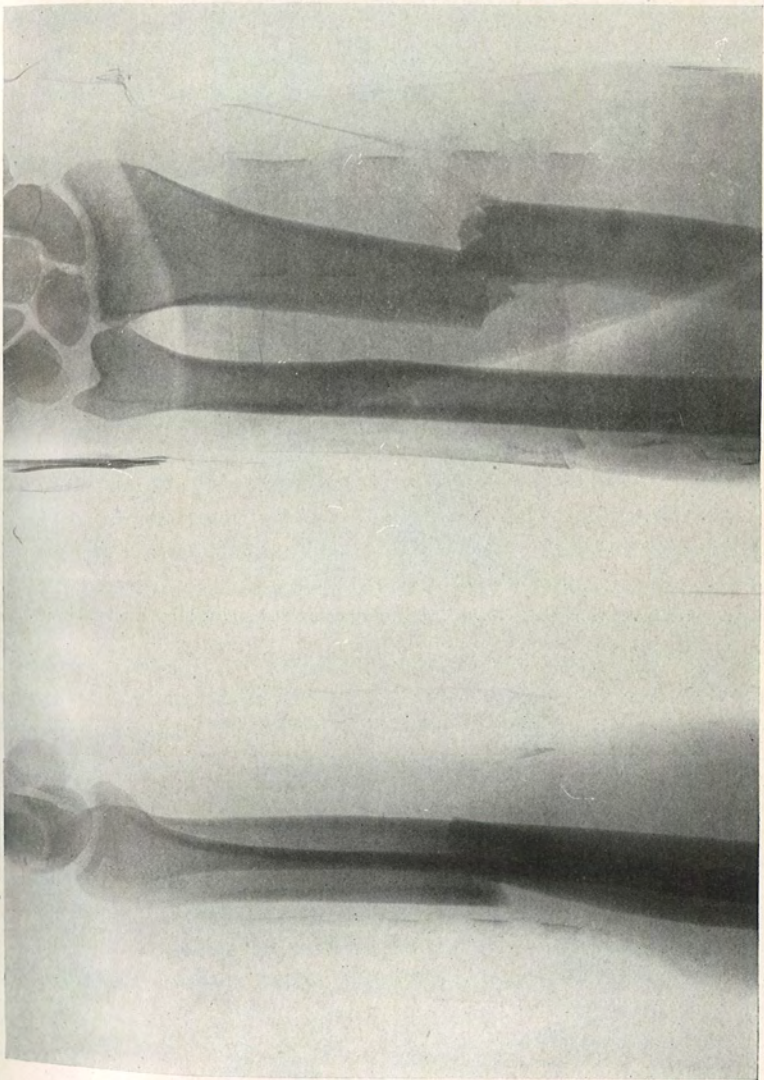


FIG. 8.

Deformity slightly corrected by interosseous padded splint; intolerable to patient; produced pressure ulceration.

splint, combined with an anterior angular splint, straight at the wrist, was applied. This latter splint should be substituted as soon as possible, as it places the hand in a more comfortable position and minimizes the chances of a stiff wrist.

The method sometimes used of treating fractures of the forearm in a semi-pronated position with a small interosseous padded splint to force the fragments apart is a dangerous one, as so much force is required that pressure ulceration is apt to occur.

Caswell, in referring to this manner of treatment, says: "If useful, intolerable; if tolerable, useless."¹

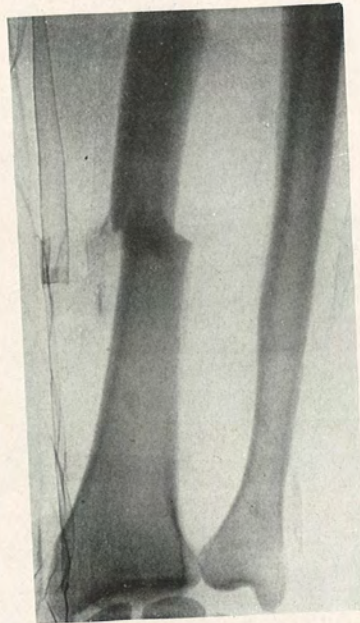
In a previous case (Fig. 7) of fracture of the radius above the pronator quadratus, an interosseous padded splint was used, correcting to a slight degree the deformity (Fig. 8). This treatment was discontinued, as the interosseous splint produced superficial ulceration. Later the arm was placed on an internal angular splint, pistol shaped at the wrist, to strongly adduct the hand (Fig. 9). This position produced almost a perfect approximation, except for the upper fragment, which was tilted forward by the action of the biceps.

In treating this fracture, not only should one try to get perfect alignment, but also, as Lansdale urged, "keep the fragments in their normal position as to their axis."²

Nélaton, in speaking of fractures of the lower end of the radius, says that Dupuytren laid great stress on the importance of overcoming radial displacement of the lower fragment. He used palmar and dorsal splints, as for fracture of both bones, and after they were applied added along the ulnar border of the forearm and hand an iron band, bent on the flat at the wrist, so as to draw the hand strongly to the ulnar side by means of tension on the external lateral ligament of the wrist.³

Amesbury, in speaking of fractures of the base of the radius, says not to allow the splint along the ulnar border to extend lower than the wrist. He says: "The hand should be suffered to drop as low as possible before it is confined to the

FIG. 9.



Arm semipronated; hand adducted; upper fragment tilted forward by action of biceps.

flat part of the back of the splint." "If the hand be confined down in this way it will act as a lever upon the carpal portion of the radius and tend to raise it."⁴

Lansdale, after describing Dupuytren's splint to secure adduction of the hand in fractures of the lower part of the shaft of the radius, says: "When the position of extreme supination is employed, neither the radial nor the ulnar splint is necessary, for then the portions of bone have not the same disposition to fall toward the ulna."⁵

According to Packard, Nélaton's dorsal splint for securing adduction of the hand was originally described by Goyrand in 1836.⁶

I wish to thank the radiographers of the Episcopal Hospital, Dr. T. S. Stewart and his assistant, Dr. A. R. Wilkinson, for the many excellent X-rays of these fractures.

REFERENCES.

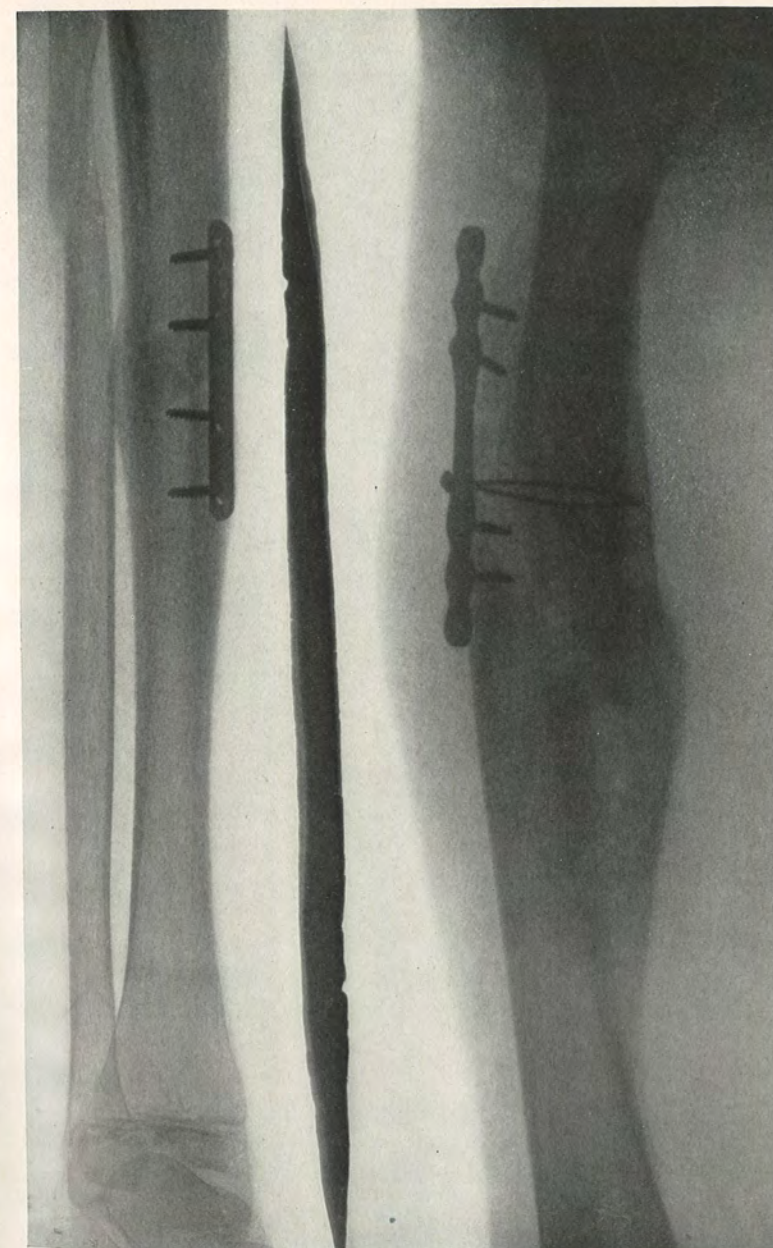
- ¹ Caswell: Holmes's System of Surgery, Am. Ed., vol. i, p. 861, as quoted by Packard.
² Packard: Ashhurst's International Encyclopædia of Surgery, vol. iv, page 164.
³ Nélaton: Pathologie Chirurgicale, Paris, 1844, vol. i, page 745.
⁴ Amesbury: Practical Remarks on the Nature and Treatment of Fractures, London, 1831, vol. ii, page 604.
⁵ Lansdale: Practical Treatise on Fractures, London, 1838, page 148.
⁶ Packard: Ashhurst's International Encyclopædia of Surgery, vol. iv, 1884.

OPEN OPERATION AND PLATING OF THE TIBIA AND FEMUR FOR RECENT FRACTURES IN A BOY OF TWELVE YEARS.

DR. JOHN H. JOYSON reported the following case:

J. H., aged 12 years, was admitted to the Presbyterian Hospital November 6, 1911, with a history of having been run over by an automobile. Examination showed a compound fracture of the middle third of the right tibia, simple fracture of the right fibula, and a simple fracture of the middle of the shaft of the left femur. There was lateral displacement of the fragments of the tibia, and an oblique fracture of the femur, with overlapping of the fragments, outward bowing, and 1½ inches shortening. Three days later the right tibia was operated upon before some of the members of the American Congress of Clinical

FIG. 1.



Result after open operation and plating for compound fracture of tibia and fracture of femur in a boy of 12 years.

Surgeons, and a Lane plate used to fix the ends, after perfect approximation had been obtained by extension and manipulation. Superficial drainage was inserted and a plaster cast applied. Manual extension was used with the patient under ether, to overcome the shortening in the left femur, and lateral moulded splints applied in combination with Buck's extension. The operation wound healed without infection and with the fragments of the tibia in perfect position.

In spite of liberal weight extension to the left extremity, angulation and overlapping persisted in the fractured femur, with $1\frac{1}{2}$ inches shortening. Nineteen days after the injury the left thigh was operated upon, when there was a large amount of callus already present surrounding the ends of the bone, and considerable union. The fragments were separated and extension was applied, using Dr. Eldridge L. Eliason's apparatus, which is a modification of that originally suggested by Dr. Edward Martin. In Martin's method strong extension is used to effect reduction, the extension being made directly over the upper end of the lower fragment, using a sterilized canvas band as a retractor. With Dr. Eliason's assistance the shortening due to muscular contraction was overcome, although there was some difficulty in maintaining approximation of the fragments after removal of the retractor, but with patience, satisfactory reduction was effected and a Lane plate applied on the outer side of the bone. The callus was so thick that the screws in the upper part of the plate did not penetrate to the solid bone, and longer screws not being at hand, it was deemed wise to reinforce the plate by passing a stout silver wire around it and the bone. The wire was then twisted and cut off short. The wound was closed with superficial drainage and a plaster cast applied, which included the pelvis.

Severe shock attended the latter stage of the operation, and the patient's condition for a time was very alarming, although hemorrhage had not been free, nor had the operation been unduly prolonged. The boy also developed a severe attack of erythema multiforma during his convalescence.

Primary healing occurred, and ten weeks after the accident the casts were permanently removed and union was firm in both tibia and femur. While the X-ray shows a slight overlapping

in the case of the latter bone, the shortening is almost imperceptible, being less than one-half inch, and the functional result is perfect.

OPEN OPERATION AND PLATING FOR OLD FRACTURE OF BOTH MALLEOLI.

DR. JOHN H. JOPSON reported also the history of a man, aged 28 years, who was admitted to the Presbyterian Hospital December 28, 1911. Six months before he had fallen a distance of 40 feet, catching his left foot between two uprights of an iron fence and fracturing his ankle. He was treated in a hospital in another city and wore a plaster cast for about two months. His ankle was greatly deformed, very painful, and he was unable to walk on it for any length of time, and was debarred from his occupation as a machinist.

An examination showed great inversion of the left foot, amounting to lateral dislocation, with displacement upward of the internal malleolus on the tibia, the external malleolus being turned inward at an acute angle. Flexion and extension were good, but lateral motion was abolished, and pain and disability pronounced (Fig. 2).

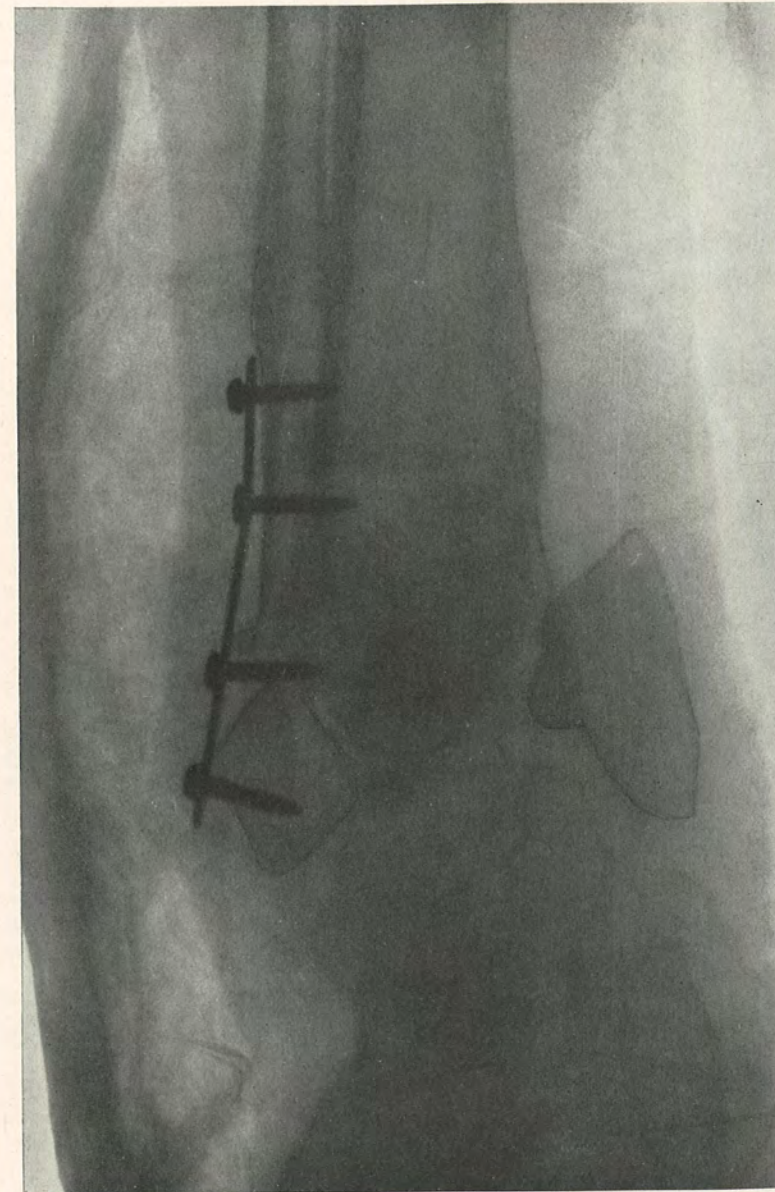
He was operated upon a few days later. An external incision over the fibula and external malleolus exposed the site of fracture, and the bone was divided at this point with an osteotome. A second incision was then made over the internal malleolus and inner surface of the tibia, the site of union between the two being exposed, and the malleolus was separated with an osteotome, following the line of union between the malleolus and shaft of the tibia. Attempts at reduction were made, but were resisted by the shortening of the tissues and upward displacement of the internal malleolus on the inner side of the ankle, and it was found necessary to remove a wedge of bone from the fibula at the site of the first osteotomy, after which the foot was forced outward into good position. A small Lane plate was applied over the point of division of the fibula to maintain correction, the upper edge of the internal malleolus having first been cut off where it was tilted widely from the shaft of the tibia. The limb was put up in a plaster cast. The wounds healed without infection. The cast was removed four weeks after operation, and union of the malleoli was then quite solid, the movements of

FIG. 2.



Fracture of both malleoli and internal dislocation of the ankle.

FIG. 3.



Result of open operation for fracture of both malleoli and internal dislocation of the ankle.

flexion and extension were good, and a new cast was applied and the patient sent home (Fig. 3).

DR. ASTLEY P. C. ASHHURST said, in regard to the method of securing extension in fractures of the femur for reduction of overlapping, he had used extension in the long axis of the leg by a compound pulley with a clove hitch above the knee in only three cases, and believes it is the best method, as one can get all the pull that the rope will stand. With the apparatus he employed a pull of 400 pounds was possible. This method well overcomes the shortening, making the limb longer by actual measurement than the normal, but makes the muscles so tense that one cannot feel the ends of the bones, and so cannot secure end-to-end apposition. In his first case, an ununited comminuted fracture which had been compound, and his second, a recent fracture, he operated, but even under ether and with the bone ends exposed he found extension by this method insufficient to reduce the fragments because the muscles were rendered so tense; but by putting an obstetrical hook over the ends of the fragments and angulating them until the ends met and then straightening them out again, reduction could be obtained without extension. In the third case he succeeded in getting perfect reduction by angulation over his forearm, without operation. They were all transverse fractures and therefore reduction, when once secured, was easier to maintain than is the case in oblique fractures.

DR. G. G. ROSS called attention to the statement Dr. Jopson made about the first case, that in any fracture of the femur in which the position was imperfect, and where he had to reinforce his Lane plate with a wire, he got prompt and satisfactory union, while in the tibia where he had perfect approximation he had delayed union. He had had this same thing happen many times to himself, where too perfect reduction with only a moderate degree of callus would be attended by delayed union.

DR. G. G. DAVIS remarked, as directly bearing on the point raised by Dr. Ross, namely the delayed union in fractures with too perfect reduction and too little callus formation, he had a recent fracture of the femur in which early operative reposition was made. Seven weeks later he cut down to remove the wire, and there was nothing to be seen on the outside of the femur but a sharply defined black line of fracture, not a bit of pro-

visional callus, and union firm, showing that apparently provisional callus is not essential to perfect union.

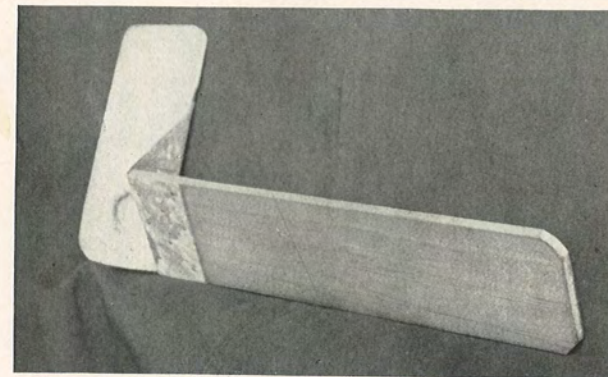
HOUR-GLASS STOMACH WITH PYLORIC STENOSIS.

DR. JOHN H. JOPSON detailed the history of a woman, aged 35 years, who was referred to him by Dr. James E. Talley with a diagnosis of probable gastric ulcer and perigastric adhesions. She gave a history of gastric hemorrhages 15 years before and recurrent gastric symptoms 10 years later. Since that time she had suffered from repeated attacks of the same nature, and had been treated by routine medical measures; she was never entirely free from symptoms between attacks, suffering more or less constantly from pain, indigestion, and gaseous eructations and annoying hiccoughs. She was a semi-invalid, although pursuing by pressure of circumstances her occupation of stenographer.

The stomach contents after test meal showed an excess of hydrochloric acid, but no blood. Physical examination of the abdomen was practically negative, there being no gastric dilatation, no points of tenderness, no unusual muscular rigidity, and no tumor.

At the operation a typical hour-glass contraction of the stomach was found, which was produced by an old thickened ulcer about three-quarters of an inch in diameter, situated at the middle of the lesser curvature, and which had surrounded itself with numerous perigastric adhesions. These adhesions had resulted in a folding upon itself of the anterior stomach wall and an elevation of the same and of the greater curvature, with adhesion to the gastrohepatic omentum. The pyloric pouch was considerably larger than the cardiac pouch. An old smooth scar at the pylorus caused a marked stenosis at this point also. Gastrolisis was performed, careful dissection and division of the perigastric adhesions being sufficient to unfold the stomach until the lumen of the contracted portion was doubled and its patulousness insured. No plastic operation on the stomach wall appeared necessary, and posterior gastro-enterostomy to the pyloric pouch concluded the operation. The gastric symptoms were quickly relieved, and the patient has remained well, two years having now elapsed. She has gained in weight, digestion is good, and beyond an occasional hiccough, which is an ex-

FIG. 4.



Fulton's lateral angular splint.

plosive phenomenon to which she seems peculiarly liable, she exhibits no stomach symptoms.

DR. WILLIAM L. RODMAN called attention to the unreliability of skiagrams in cases of supposed hour-glass contraction of the stomach. He had known of four or five cases where the skiagram pointed to a well-marked condition of this kind, yet on exploration no approach at hour-glass stomach could be found. He did not know how to explain this, unless it be due to a temporary contraction of the gastric walls, but it is nevertheless a well-attested fact.

A LATERAL ANGULAR ELBOW SPLINT.

DR. Z. M. K. FULTON presented a new angular splint, saying that in the treatment of fractures of both bones of the forearm some form of angular splint, immobilizing the elbow, is advocated by many surgeons.

The chief objection to the internal angular splint is, that it gives a position of insufficient supination. Fractures, especially above the insertion of the pronator teres, are liable to be followed by incomplete supination when treated in this position. The anterior angular splint has the disadvantage of having to be applied to the rounded belly of the biceps muscle. If not carefully watched it is liable to "creep" downward and produce serious pressure upon the anterior surface of the forearm below the bend of the elbow. This position also is sometimes uncomfortable to the patient.

If a splint could be made to be attached to the inner surface of the arm and elbow, and at the same time retain the forearm in a position of sufficient supination, it would meet some or all of these objections.

The splint which he presented is very easily made by uniting the two parts with a piece of galvanized sheet iron or any other suitable metal, which can be shaped so as to give any degree of supination. A position of supination about midway between those commonly used is the ideal one. It brings the bones of the forearm in exactly the same plane, and each parallel to the surface of the splint. In this position also the greatest muscular relaxation is obtained (Fig. 4).

In actual use he had found this splint to be easily retained in position, very comfortable, and when combined with a short posterior splint, a very efficient dressing.