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A REPORT OF SOME FRACTURES TREATED WITH PLASTER-OF-PARIS SPLINTS.[1]

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THE object of this paper is to direct attention to the utility of the plaster-of-Paris splint in the treatment of fractures. The fractures occurred in patients whose ages ranged from three days to seventy-eight years. To secure a successful result with a break at the upper third of the humerus, in a child at the tender age of three days, is, frequently, a most difficult task. Such a case was Baby H., a girl. This child, a patient of Dr. L. Jurist, sustained, during a trying instrumental delivery, a fracture at the upper third of the left humerus. Dr. Jurist employed the usual methods of management for such injuries, but could not maintain the fractured parts of the bone in apposition. Nursing, bathing, clothing, and interference by an incapable nurse all combined to frustrate the Doctor's efforts to effect a good result.

Two days after birth, with Dr. Jurist's assistance, a plaster-of-Paris splint was applied as follows: *a*, A plaster jacket, extending from just above the umbilicus

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(the cord not yet having fallen off) to the armpits, was put on; *b*, the arm, from the wrist almost to the seat of the fracture, was incased, the forearm being held nearly at a right angle with the arm; *c*, the third section commenced immediately above the point of fracture, extended well over the shoulder and was connected with the jacket by a few turns of the plaster bandage around both the left shoulder and the jacket. The case on the arm immobilized the elbow-joint, while that part above the break secured the shoulder from all movement except rotation. Extension was now made and the last section of the case was placed over the seat of the fracture, overlapping the parts of the splint on the arm above and below it. The entire arm was then secured to the trunk by several turns around the jacket. In fourteen days the plaster case was removed. The fracture had united in good position and was now protected for two weeks more by three strips of board extending from the elbow to the shoulder, thus allowing gentle manipulation of the joints. The plaster case was applied over absorbent cotton, which protected the skin from irritation. There was no deformity or loss of motion.

CASE II.—A boy, William M., aged three years, fell and produced a "T" fracture of the right humerus. The arm was much swollen at the seat of fracture, and there was great difficulty in applying a splint in such a manner as to secure proper approximation of the broken ends of the bone without making too great pressure with the splint and bandage. It was, therefore, decided that a plaster-of-Paris case would give the most satisfactory result. The case was put on, over absorbent cotton, in three sections, the third section being placed over the seat of fracture and connecting with the sections on the forearm and arm. The section on the arm extended from just above the elbow-joint to the armpit. The splint was removed in three weeks. Inspection of the arm at that time, and again in ten days, showed that

there was good union with no deformity, and that the "carrying function" of the arm was preserved.

CASE III.—W. O., aged twelve years, as the result of a fall, suffered a compound fracture of the right ulna and radius at their lower thirds. Some resection of both bones was necessary for satisfactory approximation of their ends. Extensive cellulitis, with profuse purulent discharges, set in within a few days. The pain occasioned by the frequent dressing of the wound as well as the likelihood of non-union of the bones, rendered it needful to immobilize the entire arm. A plaster-of-Paris case was put on in three sections, as in the preceding case, except that the third section covered the seat of fracture and was not over the elbow-joint. The proximal section began immediately above the break and extended over the elbow and up to the axilla, while the distal section covered the extended hand and fingers. Trap-doors were cut in the case, allowing the arm to be dressed without giving pain to the patient or disturbing the bones. The boy made an uneventful recovery, with good use of the arm. The case remained on ten weeks. It is but fair to state that the broken ends of the bones had been pushed into the dirt, rendering asepsis almost impossible.

CASE IV.—Mary W., aged four years, an idiot, suffered a fracture of the upper third of the left femur. She was unusually hard to manage, requiring constant watching to keep her and the dressings in place. Finding that she could not be controlled, a plaster case was applied. The distal section began at the toes and extended to a point just below the fracture. The proximal section began above the break and incased the entire trunk. While this section was hardening the child was on her right side and the upper third of the bone was held in proper position, as though the whole leg were straight and unbroken. With the child still on her right side, the middle section was now applied and the entire leg

was immobilized in extension. The splint remained on eight weeks, giving good union, with but one-quarter inch of shortening, which may have existed prior to the fracture. The child soon learned to walk without any limp.

CASE V.—J. B., a boy, aged three years, an emigrant, had his right femur broken at its upper third, during a storm at sea. His mother, with five other children, was compelled to leave him in order that she might join her husband, who had gone West some months before. Ten days after the injury, a plaster splint was made, as in the preceding case, and in twelve weeks the boy was cured and sent home. In this case there was no shortening, but the right leg may have been longer than the left prior to the break.

CASE VI.—W. M., nineteen years old, suffered a fracture of his left femur, at its middle third. Extension and sand-bags were used. After eight weeks, union having taken place, he was allowed to get up on crutches, but did not use them, and within ten days his leg was badly bent outward at the seat of fracture. He was etherized and his leg and trunk were incased in a plaster splint as follows: From just above the fracture to the armpits a continuous splint was applied, along the left side of which a stout strip of board, about two and one-half inches wide and four feet long, was fastened by some additional turns of the bandage around the plaster jacket. The second section extended from the toes to the seat of fracture. When these sections had set, the leg was firmly pressed outward and the board was now fastened by plaster bandages to the leg part of the splint. Thus the board exerted a continuous outward leverage on the leg below the seat of fracture. In three weeks the man got up with a straight leg and had no further trouble.

CASE VII.—Mrs. S., a widow, aged seventy-eight years, fell down a flight of stairs and suffered a com-

pound fracture of the left femur, three inches above the condyles. The wound and the surrounding parts were rendered aseptic and dressed with mercuric-chlorid gauze after a little aseptic iodoform had been sprinkled over the wound. The patient was then etherized and a plaster splint applied. One section extended from the toes to just below the fracture, and a second section began above the injured part and covered the leg and trunk. The third and last piece of the splint was put on over the wounded part, connecting the first and second sections. The woman was carefully watched for a rise of temperature, which was rather expected, but none occurring, the splint was not removed until the ninth week. Gentle motion and massage were now employed to restore the function of the joints. The woman is, at the time of this writing, entirely cured and can walk as well as she ever could. She had no pain to speak of, and travelled six hundred miles on the cars within three months after the reception of the injury.

To sum up: All of these plaster cases were put on over absorbent cotton, thereby guarding against undue pressure from swelling or upon bony prominences. There were no bedsores or excoriations in any case. The patient's position could be changed, and bathing was practised with little discomfort. The plaster splint does not require constant re-application or re-adjustment, as do most splints, for in these cases the splints were not removed until a cure had been effected. Plaster splints are cheap and durable. In fractures of the upper extremities, the patients, after a few days in non-septic cases, may walk around with perfect security when wearing a plaster-of-Paris dressing.