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FRACTURES OF THE FEMUR IN CHILDREN,

TREATED BY BRYANT'S METHOD OF VERTICAL EXTENSION.

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FRACTURES OF THE FEMUR IN CHILDREN,

Treated by Bryant's Method of Vertical Extension.

The treatment of fractures of the femur in children has always been attended with great difficulty. The fragments are so short they are not readily grasped by the dressings, and usually the thigh is so comparatively large and soft that the extremities of the fragments are with difficulty maintained in apposition. Only the most firm and secure dressings will be retained, as all the efforts of the sufferer are directed towards their removal. The dressings are soon soiled by the discharges from the bladder and bowels; and frequent renewals interfere with the process of repair. The displacement of the dressings by the patient, causing injurious pressure, and the uncertainty which the surgeon feels concerning the condition of the limb, necessitate frequent examinations, especially when the child shows evidences of discomfort.

The disappointment following the usual methods of treatment is perhaps best shown by the fact that in St. Bartholomew's Hospital Reports for 1867, Messrs. Paget and Callender reported that they treated many cases of fracture of the thigh in children negatively, without splints, all apparatus being dispensed with, "the child being laid on a firm bed with the broken limb, after setting it, bent at the hip and knee and laid on its outer side."

The plaster dressing is a valuable one in these fractures, and as usually applied—with short splints around the femur and a long splint reaching from the axilla to below the foot, thoroughly covered in with plaster bandages, and either varnished or covered with oiled silk to protect it from the discharges—has often given admirable results.

If dressed immediately after the injury, the subsequent swelling may cause injurious pressure, and if the dressing be made loose enough to allow for this, or if not applied until it has occurred, the fragments will be but poorly supported after the swelling has disappeared. Some of the discharges may get under the bandages without being suspected and cause considerable irritation. From these causes, and from uncertainty regarding the condition of the limb, it not unfrequently happens that the dressing has to be removed once or more during the treatment.

As it is usual to give ether in applying these plaster dressings, and as the surgeon scarcely cares to delegate it to an assistant, frequent applications are a great objection, especially in hospital practice. On removing these dressings when the treatment has terminated I have often felt considerable uncertainty as to what kind of a result would appear.

A method of treating fractures of the femur in children by vertical extension is described and claimed as original by Bryant in his "Practice of Surgery," published in 1873, and also in the later editions. This method, though possessing many advantages, is unnoticed by the other surgical text-books, and but few surgeons among those of whom I have inquired have had any experience with it. Under these circumstances I feel warranted in bringing this subject before this Association, and reporting five cases that I have treated by this method. Bryant flexes the limbs to a right angle with the pelvis, fixes them by applying some light splint, and then they are "hoisted upward and fastened to some cradle, hook or bar above the the bed." This in my cases has been slightly modified, substituting counter-poise weights for the simple fastening.

Case 1.—Mary F., aged 2½ years, was admitted into the Jefferson College Hospital July 6, 1884, with a fracture about the middle of the left femur. I applied the plaster dressing, which had served my pur-

pose well in previous cases, but was obliged on the second day to remove it, and I adopted this method. The usual adhesive plaster, carried well above the knee, the same as is used for making extension in adults in the ordinary method of horizontal extension, was applied to each limb, to the sound as well as to the injured one. After the plaster had become firm, a light wooden frame, extending across the bed and about four feet above it, was placed in position, (such a frame as is usually used for swinging fracture boxes from, consisting simply of two uprights, one on each side of the bed, and a light bar connecting them,) in the lower edge of the transverse bar four iron pulley wheels had been fastened, two about the middle, a few inches apart, and one at each end close to the "upright." The limbs of the child were elevated to a right angle with the rest of the body, the cord from the adhesive plasters on one of the limbs was carried through one of the middle pulleys and then through the pulley at the end of the bar; here the weight was attached. The cord from the other leg was then carried in a similar manner to the other side. The heavier weight was attached to the injured limb, but only enough to the sound leg to keep it fairly elevated. The fracture came immediately into good position, but for greater safety a few short and narrow splints were applied around the seat of injury, supported by a light bandage. The child was comfortable at once and continued so.

The apparatus was removed about the twentieth day, as firm union had occurred; the child was kept in bed a few days longer, and then permitted to creep and walk around the ward. She was discharged thirty-five days after admission with a perfect leg, in which neither shortening nor deformity were detected.

Case 2.—Nils Christian Thompson, aged 4 years, injured on shipboard coming from Denmark, was admitted to the Jefferson College Hospital on July

21, 1884, with a fracture of the femur at the junction of the upper with the middle third, a frequent seat of fracture in children, and as the upper fragment has as strong, if not a stronger tendency to be displaced forward than in adults, this method of treatment is particularly well adapted for remedying this deformity. This patient was placed in a precisely similar apparatus, in which he was kept for twenty-five days. The boy was discharged well, with less than one-half an inch of shortening, August 10, and with the limb in perfect position.

Case 3.—Gustav S., aged 3 years, was admitted on February 12, 1885, to the German Hospital of Philadelphia. His fracture was also at the junction of the middle with the upper third. After an unsatisfactory trial of another method I placed him, a few days after admission, in an apparatus similar to those before described. He was discharged on April 23, having been running around the wards for several weeks under treatment for another affection. Dr. Rehfuss, the resident physician, who examined him before he left, tells me that the limb was in perfect position, without perceptible shortening, and that he had full and free use of it.

Case 4.—John W. MacA., æt. 6 years, was admitted to the German Hospital May 9, 1885, with a fracture of the upper part of the right femur. He was treated in the same manner, and was discharged July 6 with a perfect result.

Case 5.—Benj. H., aged 2 years 3 months, a private patient, fractured his left femur about its middle on November 2, 1885. He was placed in the same form of apparatus, and made a very satisfactory recovery with good union in about three weeks.

None of these children seemed to suffer the slightest inconvenience or annoyance from their position; they amused themselves by playing with their toys, appeared quite happy and entirely free from pain. As the limb cannot get out of position while full ex-

tension is maintained, and is so readily examined, the surgeon need feel no anxiety regarding its condition.

It is rarely necessary to remove the light bandage and splints around the femur, but when necessary it can be done without assistance, and without paining or frightening the patient or displacing the fragments. It is quite as easy to measure the length in this position as in the treatment by horizontal extension in the adult. The swelling is usually slight, but even when great does not interfere with the treatment. I have never seen, while using this method, those masses of redundant callus which are not infrequently found in the fractures of restless children.

The child is readily kept clean; all that is necessary is a folded sheet placed under the buttocks to receive the discharges, and removed when soiled, The nurse grasps the child by the feet, and gently raises it some inches from the bed, and as it is nearly counterpoised, it can be kept in this position with but little effort on her part, while the hips and back are washed and a clean sheet put in position. In winter some of the bedclothes are given a turn around the limbs and hang suspended by the extension cords.

The amount of weight used for extension depends, of course, on the size of the child, but about the same amount as would be used in horizontal extension was found to be quite enough.