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TREATMENT OF FRACTURES OF THE FEMUR, BY SIMPLE EXTENSION.

There have been many different means employed, more or less successfully, for the treatment of fractures of the femur, and from these of course it is our duty to select the best. Here, as everywhere else, the best means are those which will fulfill the indications in the simplest possible way. These are simply to place the fractured ends in apposition, and to keep them so until the reparative process has gone far enough to establish firm union, while special attention is to be paid to the preservation of symmetry and proper length of the injured limb.

The design of this paper is to place in a more prominent light a mode of treatment which, from several considerations promises, and so far as limited observation can be depended upon, has already proved to be much superior to former methods.

It may be briefly, yet competently, described as follows: The patient is placed in bed, and a broad, well padded perineal belt adjusted as in all cases where it is indicated, with the exception that instead of being fastened to a splint, it is secured to the head of the bedstead, and no splint at all is made use of, as the powerful muscles and fascia that envelope the femur are amply competent to support and fix the bone. The pelvis being thus fixed by the perineal belt, extension is obtained by means of adhesive strips secured to the leg. The plasters are cut proportionally to the size of the limb, from one-half to one inch in breadth, and of sufficient length to be applied along the outside of the leg, descending spirally, protruding so as to form a strong loop under the sole of the foot, and then extending up on the inside of the leg. These strips are not applied one directly over the other, but at small distances apart, so as to embrace a larger surface of the leg, thus equalizing the tension upon the integument. Then a number of shorter strips are applied in a manner similar to the many tailed bandage, surrounding and securing the long plasters against possible detachment. The shorter strips are not indispensible, as the same end may be attained by a simple roller.

All that is now necessary is to pass a strong cord through the loop of plasters, and secure it to the foot of the bedstead. The simplicity of this method is a strong recommendation. There are many occasions when a Liston splint, or any other, can be obtained only with difficulty; for the treatment by this method nothing is required but ordinary adhesive plaster, which can be obtained very readily; and an old sheet or rope will furnish the remaining complement of apparatus.

The patient can move about in the bed as much as is necessary, with greater freedom than when embarrassed by a long splint, and with really less danger of displacement. The seat of fracture can be examined at any moment without having a long bandage to unroll, and wet cloths or other local applications can be used with as great facility as if the limb were well. The advantages of this method of extension are best manifested in the case of compound fractures; the wound of the muscles and integument is as perfectly accessable as if it were not complicated with a fracture. Perfect cleanliness may be preserved, which is an important consideration, and which it is impossible to obtain when the splint and bandage are used, without much trouble both to the surgeon and patient.

The limb can be measured as often as is desired, and the amount of extension regulated accordingly, with scarcely any trouble, by merely tightening the cord which secures the foot to the end of the bedstead. The circulation is not interfered with, as is often the case when the splint and roller is used; especially when not rightly applied; and, what is to be considered of great importance, the patient is far more comfortable than when trammeled by the usual dressings.

There is less danger of sloughing of the heel or malleolus, a complication by no means seldom met with under the usual treatment, because here there need be no pressure upon the prominent bony projections, either from the bed or the dressings; and with regard to the perineal belt, the chances of excoriation are not greater than when the long splint is employed. In fact, the line of traction in the latter case being more oblique, has greater tendency to press the upper part of the thigh outward, and is consequently more painful than when the force is applied more directly to the pelvis, which effect may always be obtained by a proper adjustment of the perineal belt.

One other, and not the least advantage, is that in this form of treatment there is no agglutination of the muscles to the bone, or

each other, and consequently no stiffening of the limb from that source; and as soon as the bone is strong enough to bear the weight of the patient, the muscles are ready to do their part in the locomotion.

One objection, and by the way the only one which possesses a show of validity, has been made, that the foot is liable to evert or invert; but a single moment's reflection will satisfy any one that no great ingenuity is required to avoid this—a bag of sand or bran on either side of the foot, or a strip of plaster, or of cloth, any of these simple means can be so employed as to maintain the foot in a proper position.

The fact to be dwelt upon is, that but little extension is necessary during the first stage of treatment. In order to prevent perineal excoriations, and accustom the patient to the necessary pressure when union is taking place, little more is essential, at first, than what is required to overcome spasmodic muscular contraction, and displacement of the fractured ends. When the process of reparation has been thoroughly begun, even after the provisional callus has been thrown out, or at all events has begun to form, say a period of fifteen days, there is time enough to use extension for the purpose of acquiring the necessary length of the limb. In this way the patient has an opportunity of becoming accustomed to the confinement, and the parts where the pressure falls became inured and hardened, and thus better prepared for the necessary extending force.

The efficacy of this treatment, like that of many and all others, is to be tested by its practical results, so far as an experience of ten years, which it is granted is only a limited time, can be depended upon, there is no method more reliable than this. There is none under which more favorable results have proceeded, none in which there have been fewer failures, considering the different varieties of fractures to which it is applicable, and in which it has been used; and also considering the circumstances which have often attended upon, and of course complicated this as all other methods, it has been eminently successful, and has been exclusively used in private practice with uniform satisfaction. No written histories have been kept of the majority of these cases, except facts obtained from note-books, but the results have been such as to warrant its indiscriminate use.

By this method there have been treated twenty-five cases, ten of which were hospital, and fifteen were private patients. Of the latter six were intra-capsular.

In the case of hospital patients records have been kept, more or less full and perfect, and from these records the following cases have been quoted, as illustrating fairly the results of this practice.

Hospital Record. Case 97.—William Graham, aged 26, Ireland, was admitted June 15, 1853, with fracture of the right femur, by the falling of a pile of lumber. Extension and counter-extension made by perineal belt and adhesive strips to leg. August 5, after a period of seven weeks and two days, extension discontinued; on the fifteenth, patient walked with crutches, and on the 25th was discharged with a sound limb, only half an inch short, after a treatment of not quite nine weeks.

Case 106.—Martin Connor, aged 35, Ireland, was admitted Aug. 3, 1853, with fracture of the right femur, a trifle below its middle, and also fracture of the fibula, two or three inches above the malleolus. Extension and counter-extension by perineal belt, and adhesive strips to the leg; on the first of September the case passed into the hands of a surgeon to whom this method of treatment was distasteful. Sept. 17, after a period of six weeks and three days, extension was discontinued, and the leg found to be half an inch short. On the 26th patient was discharged, cured, after having been under treatment seven weeks and five days. It is probable that in this case the extension might have been made sufficiently to have prevented the half inch shortening.

Case 108.—August 12, 1853, admitted Stephen M. Wiggins, aged 21, with fracture of the left femur at its lower third. On the first of September this patient, like the last, passed into other hands. Extension was discontinued, and the limb found to be less than half an inch short. October 3d, after a period of seven weeks and three days, patient walked with crutches. October 14, patient's cane slipped, and his entire weight falling upon the injured leg, the callus was broken up. Liston's splint was then applied. November 10th, four weeks after the second fracture, long splint removed, and pasteboard splints and rollers applied. November 14th, walked with crutches, and November 22d discharged cured, with leg half an inch short, fifteen weeks after the first, and six weeks after the second fracture.

Case 135.—January 5, 1854, admitted John A. Pitcher, aged 21, Germany. Patient met with a fall of thirty feet, fracturing the femur at its middle; also the left tibia and fibula at their lower third; extension by perineal belt, and adhesive strips at the lower part of the the thigh, just below the patella. Strips were

also applied to the lower part of the leg, forming a loop under the sole of the foot, upon which extension was made, merely sufficient to maintain the fractured ends of the tibia and fibula *in situ*, the principal extension being between the perineal belt, and the lower end of the thigh. Feb. 14, six weeks lacking two days from the date of the accident, the extension was discontinued Feb. 23, patient was discharged cured, having been under treatment seven weeks. According to the records, the foot was a little everted, which might readily be accounted for by the complicated nature of the case. No mention is made of any deficiency in length.

Case 139.—February 22, 1854, admitted James McKenzie, aged 16, Scotland, with compound fracture of the left femur, through its middle. Extension and counter-extension by perineal belt, and adhesive strips to leg. In consequence of the fact that the other thigh had been fractured previously, and was three-quarters of an inch short, the extension in this case was only made sufficiently to accommodate the length of this leg to the other. April 3, after six weeks lacking two days, extension was discontinued, and May 1st patient was discharged cured, with legs of equal length, having been under treatment ten weeks, lacking two days.

Case 206.—February 13, 1855, admitted Mary Petitt, aged 24, Ireland, with fracture of the left femur, at its lower third, by a fall upon the side-walk. The bone had for a long time been diseased, fistulous opening having appeared from time to time, leaving cicatrices, some of which still remain. Near the site of the fracture was a fistulous opening, through which was detected carious bone. Extension made by perineal belt, and adhesive strips. April 17, nine weeks from date of fracture, extension was discontinued, and union found pretty firm; the fistula remaining open, and necrossed bone escaping occasionally, patient was not discharged until June 17, two months after. The case was then as complete as could be hoped for.

Case 250.—July 19, 1855, admitted Wm. Malloy, aged 18, Ireland, with fracture of left femur at its upper third. Extension and counter-extension made by perineal belt and adhesive strips. September 10, eight weeks lacking two days from time of injury, extension was discontinued. September 22, nine weeks and two days, patient discharged cured. Record says nothing as to length of injured limb.

Case 340.—Feb. 3, 1857, admitted John Levine, aged 19, Ireland, with fracture of femur through its middle. Extension and

counter-extension by perineal belt and adhesive plaster. March 7, five weeks lacking three days, extension discontinued, and leg firm, with no distortion.

Case 400.—Nov. 7, 1857, admitted Wm Devine, aged 30, Ireland, with fracture of femur near its middle. Extension and counter-extension by perineal belt and adhesive strips. Dec. 25, seven weeks after injury, extension was discontinued. Jan. 9, nine weeks, walked with crutches, and Jan. 14, discharged cured, with no perceptible difference between the sound and injured limb, as regards shape or length, having been under treatment nine weeks and five days.

Case 457.—June 24, 1858, admitted James Linan, U. S., aged 13, with fracture of right femur through its middle. Extension and counter-extension by perineal belt and adhesive strips. Aug. 23, nine weeks lacking three days from the date of injury, patient was discharged cured, with a perfect limb.

The history of these cases have been kept, as was said before, with more or less exactness, but are, on the whole, as reliable as such records generally are. The above patients, some of them passed through different hands, some of which were not familiar with this mode of treatment; some *sceptical*, and under such circumstances, some degree of vigilance would be necessary to secure a favorable result in all cases. The utmost extent of shortening mentioned above did not exceed half an inch, and the question is left for candid minds to decide whether that half inch might not have been avoided by extension made sufficiently at the proper time.

Without further comment upon these cases treated in the hospital, the following are alluded to, which all occurred in private practice. As was said before, no daily record was kept, but facts were noted down of the result as they occurred.

J. E., aged 42 years, oblique fracture of upper third of femur; much contused; extension six weeks; discharged in ten weeks. Limb little less than half an inch short.

J. F., aged 30, contusion of soft parts and fracture of upper third of femur; railroad accident; extension discontinued in six weeks. Patient walked to office with crutch and cane from Greenbush, in eight weeks from the date of accident. No distortion or shortening.

O. H., aged 14, fracture of lower third of femur; extension discontinued in four weeks; pretty firm; union in three weeks; walking with cane and crutch in six weeks; no distortion or shortening.

P. R., aged 9 years, fracture of upper third of femur; union firm in three weeks; extension discontinued in four weeks; walked with cane and crutch in six weeks; no distortion or shortening.

F. Mc., aged 18, fractures of femur tibia and fibula; treated as described in hospital patient, with like accident; union firm in four weeks; extension discontinued in six weeks; walked with cane and crutch in eight weeks; no distortion or shortening.

J. C., aged 40, compound fracture of upper third of femur; union firm in six weeks; walked in nine weeks; no distortion or shortening.

P. F., aged 32, fracture of middle third of femur; union firm in five weeks; walked in eight weeks, with crutch and cane.

McW., aged 9 years, fracture of lower third of femur; union firm at three weeks; extension discontinued in four weeks and three days; no distortion or shortening. This patient is now under treatment.

All of these cases were treated as above described. In but one of them was there visible shortening, nor was there any distortion of the thigh; no eversion or inversion of the foot. The average period of time during which extension was maintained was five weeks; and in the majority of cases, union was tolerably firm at the expiration of *three* to *four* weeks, varying according to the age of the patient, and the nature of the injury.

In addition to the above were six cases of fracture, within the capsular ligament, occurring in patients, most of them over sixty years of age, and all treated by this method of extension, with results much better than could be expected, and which it would have been vain to expect under the usual treatment.