The American hip-splint = Éclisse américaine du fémur = Die Amerikanische Hüftschiene / by A.B. Judson.

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THE AMERICAN HIP-SPLINT.

BY

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OF NEW YORK.

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THE AMERICAN HIP-SPLINT.

ÉCLISSE AMÉRICAINE DU FÉMUR.

DIE AMERIKANISCHE HÜFTSCHIENE.

BY DR. A. B. JUDSON,
New York.

In the present Congress, the first held in America, it will not be thought inappropriate to devote a short paper, chiefly historical in its character, to the American splint for the treatment of hip disease.

This apparatus was first described by Dr. Henry G. Davis and Dr. Lewis A. Sayre, in the April number of the *American Medical Monthly*, published in 1860. These two surgeons wrote independently, but by a curious coincidence they both described a new splint which was recognized as an important invention, not only in this country, but especially in England and France, where it was known as the American splint. Under this name it has been described and discussed by Edwards[1], Barwell[2], Holmes[3], Marsh[4], Adams[5], Thomas[6], Bouvier[7], Le Fort[7], Velpeau[7], Verneuil[7] Giraldes[7], Armand[8], E. Boeckel[9], Hennequin[10], Monod[11] and Philipeaux[12], and doubtless by other eminent European surgeons.

It will be interesting to inquire whether the name American has been rightly given to this apparatus? As first described, in 1860, it has two important features: (1) A perineal strap or ischiatic crutch-head, for the purpose of keeping the weight of the body from resting on the affected limb, the patient being thus enabled to engage actively in ordinary pursuits while wearing the splint and (2) adhesive plaster applied with the view of making traction on the limb.

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[1] *Edinburgh Medical Journal*, June, 1861, p. 1118.
[2] *Lancet*, Nov. 7th, 1863, p. 530. "Diseases of the Joints," 2d Edition, London, 1881, p. 467.
[3] "Diseases of Infancy and Childhood," 2d Edition, London, 1869, p. 432.
[4] *British Medical Journal*, July 28th, 1877, p. 98.
[5] *British Medical Journal*, Jan. 5th, 1878, p. 10.
[6] "Review of the Treatment of Hip Disease," Liverpool, 1878. Preface.
[7] *Bull. de la Soc. de chir.* 1866, pp. 122, 126, 147, 154.
[8] *Thèse de Paris*, 1878, p. 37.
[9] *Bull. gén de Thérapeutique*, 1875, p. 451.
[10] *Arch. gén.*, Jan., 1869, p. 62.
[11] *Arch. gén.*, June, 1878, pp. 704–712.
[12] "De la Coxalgie," Paris, 1867, pp. 261, 262, 284.

In regard to these two features, ischiatic support and traction by the use of adhesive plaster, the first was not an American invention, nor was it a novelty. Support of this kind had been used for a long time in the construction of artificial limbs, and even in the treatment of hip disease the possibility of so supporting the body had occurred to M. Ferdinand Martin, a wood-cut of whose splint is found in Bonnet's "Treatise on Diseases of the Joints," published in 1853.

But when we come to consider the other remarkable feature of this splint, we recognize a real advance in mechanical surgery, and one which may rightly be called American. The use of adhesive plaster for prehension of the limb, in the treatment of fracture of the long bones, was an American invention, and the transfer of this device from the treatment of fractures to that of hip disease was first effected in the new splint. For many years it had been a common practice in the treatment of hip disease to make traction with the long splint for fracture of the femur, prehension of the limb being made by a gaiter, or fillet or handkerchief placed around the ankle. These instruments of torture were supplanted in the new hip splint by the absolutely comfortable and convenient adhesive plasters. Thus we see that the new splint was a combination of an old device, ischiatic support, with an American invention, traction by adhesive plaster, and as the happy combination was made in America, it is not strange that the courteous attitude of European surgeons toward the surgery of a comparatively new country, led them to call the new method the American method and the new splint the American splint.

Following the history of the hip splint in this country for the past twenty-seven years, one is amazed at the great number of the so-called improvements that have been made upon it. The most important has been a perfecting of that part of the apparatus which provides for ischiatic support of the body in standing and walking. The first splint did not extend to the ground, but depended on the integrity of the plaster adhesion for keeping the weight of the body from resting on the inflamed joint. Dr. Edmund Andrews,[1] of Chicago, and Dr. C. Fayette Taylor,[2] of New York, proposed and perfected an extension of the splint to the ground, and thus left but little to be desired as an ischiatic crutch. Aside from this great improvement no essential changes have been made. Experience and increasing light have shown that certain things which it was thought that the splint accomplished are mechanically beyond its reach, and that some things supposed to be desirable and even necessary to proper mechanical treatment are of no importance whatever. The two things which the splint does every day, and which it has done ever since the improvement above mentioned, the two functions of the splint, so to speak, are (1) to make the affected limb a pendent member, resembling in this respect the arm, when the patient is erect,[3] which it does as an ischiatic crutch, and (2) to apply traction to the distal member of the joint, which it does by its rack and pinion and adhesive plaster. Traction protects the joint from the friction matism of motion, muscular or otherwise, and the ischiatic support protects it from the traumatisms of standing and walking, while the patient runs about and follows the ordinary pursuits of life for the months and years necessary to bring about a recovery with restoration of ability and symmetry, so far as may be.

I will close by briefly referring to two points of practical utility. The first is in regard to an early diagnosis, which is especially of great importance, inasmuch as there is reason to believe that if treatment can be begun sufficiently early the focus of oste

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[1] *Chicago Med. Examiner*, Dec. 1860, pp. 753, 754.

[2] *Medical Record*, Sept. 1st, 1867, pp. 289–291.

[3] It is interesting in this connection to recall the words of M. Hennequin: "Mais le c humain peut-il conserver pendant des mois entiers l'attitude verticale, touchant le sol par un seulement? Évidemment non; c'est au-dessus de ses forces."—*Arch. gén.*, Jan., 1869, p. 64

he cancellous tissue may be resolved before the other structures of the joint are lved. Reason for this belief is found in the fact that disease of the joints is comtively rare in the upper extremity, where a focus, being in a pendent member, may ergo resolution, protected, as it is by the nature of the case, from the traumatisms ch assail the lower extremity in standing and walking.

Now, if the lower extremity can be made pendent, as can easily be done by the of the hip splint, in the very incipiency of articular osteitis of the hip, before the cular contours are changed and before the circumarticular muscles are seriously lved, we may look for resolution of the osteitic focus and recovery without lameness mpairment of motion.

To assist in making an early diagnosis in a doubtful case a careful study should be le of those limitations in the motions of the joints which become apparent only when extremes of normal motion are approached. This may be done in various ways. I e found two methods easy in practice and certain in their revelations. The first hod applies to rotation, which is a direction in which limitation of motion first es place. Let the patient lie supine with the feet slightly apart. With the hand ced lightly on the knee of the unsuspected limb a rocking or oscillating motion is en to the whole limb, outward and inward rotation following each other, while the sweeps through an arc of nearly 180°, the inner border of the foot striking the le, and the outer border nearly reaching that level. This occurs in the well limb. similar manipulation of the suspected limb may reveal a slight limitation of rotation, result of hip disease. The other simple procedure relates to flexion. Let the patient, l on the table, sit up and kiss the knee. By flexing the neck and back and drawing limb up with the hands this can easily be done with the unaffected limb, while the empt to do it with the suspected limb may reveal a slight limitation of flexion indicae of hip disease.

Another diagnostic sign, too little thought of perhaps, but of importance in the very ly stage, has recently been referred to by Dr. A. J. Steele,[1] of St. Louis, Missouri, as brawny thickening about the joint in front of the capsule or behind the trochanter." ere will in some cases be found a condensation of the soft tissues, due apparently to e vicinity of osteitis, not visible, perhaps, but recognized by palpation or pinching th the thumb and finger, and then often not detected, excepting by comparing the o sides. It will be found that a smaller pinch of the skin and underlying tissue can made on the well than on the affected side. These tests are to be used, of course, in nnection with other diagnostic helps and with due regard to other conditions which ve the power to produce similar phenomena. Properly used they may betray the esence of hip disease in a patient as yet entirely free from pain and lameness.

The other practical point which I would emphasize relates to the position of the mb. Adduction is most to be dreaded. It causes tilting of the pelvis and apparent ortening, which, although technically *apparent*, produces more disability and deformy than the shortening which is called real. It is due, as a general thing, to the fact at the patient uses the well limb more than the affected one in walking, putting the rmer forward in less time than the latter, and unconsciously keeping the affected mb off the ground more than half of the time, and drawing up and adducting it in rder to make it less of an impediment. To remedy and prevent this, the patient, durng and after treatment, should be drilled in rhythmical walking, which compels the ffected limb (protected by the splint during treatment) to do its full share of the work f locomotion, and leads the patient unconsciously to thrust the affected limb down and abduct it so that it may be in the best position to receive the weight of the body, and o its half of the work of progression. It is gratifying to witness a recovery in which

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[1] *Transactions* Missouri State Medical Association, 1887, p. 102.

real shortening is more than counterbalanced by apparent lengthening. Althou may be the case when the patient is discharged, the abduction, which is so favo feature, is likely to disappear and give place to adduction, with its disabili deformity, if the gait is allowed to become habitually irregular.

Figures 1, 2[1] and 3[2] will give an idea of modifications made in the hip sp the writer.

FIG. 3.

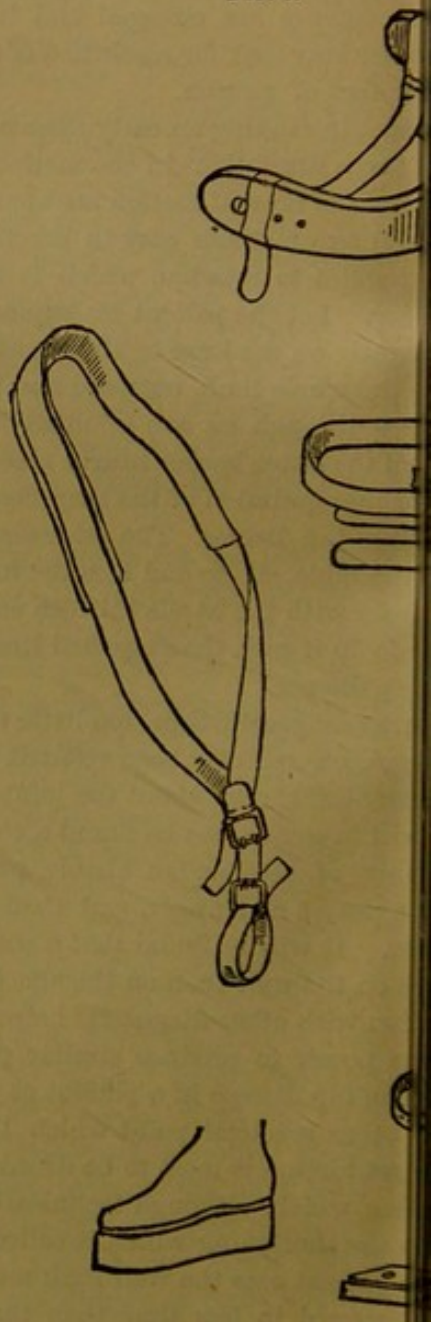
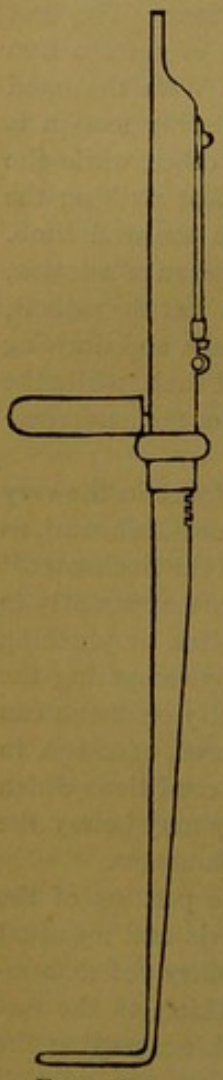


FIG. 1.



Front view.

FIG. 2.

Side view.

In closing, I would deprecate a tendency to complicate the mechanics of t splint. If its true functions, which are few in number and simple, and the lim of its usefulness, are duly recognized, it will be found a most useful and con appliance.

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[1] *New York Medical Journal*, January 24th, 1885, pp. 111, 112.
[2] *Medical Record*, June 25th, 1887, pp. 721, 722.