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PART I.

ORIGINAL COMMUNICATIONS.

ART. VI.—*On the Treatment of Luxations by Robert's Modification of Jarvis' Adjuster.* By WILLIAM STOKES, Professor of Surgery, Royal College of Surgeons; Surgeon to Richmond Surgical Hospital, &c., &c.

IN the winter session of 1865–1866, I witnessed, in the *clinique* of Professor Nélaton, some cases of luxations successfully treated by Jarvis' adjuster, and from the manner in which the eminent French professor spoke of the value of the appliance, and the results I saw obtained, I formed a high opinion of it. A short time subsequently, a modification, and in many respects an improvement on the original adjuster, was devised by M. Robert, of Paris, and it is to this appliance that I wish more especially to draw attention.

I may mention that I have already brought this instrument under the notice of the Surgical Society of Ireland, and also of the Surgical Section at the annual meeting of the British Medical Association, held in Birmingham last year. A larger experience of the appliance than I then possessed, has gone far to confirm me in the favourable opinion I at first formed as to its value.

In overcoming the muscular resistances which oppose the reduction of dislocations, the surgeon has, as a rule, hitherto employed one or other of two kinds of force, viz., either physical or mechanical. The former has often succeeded when the latter has failed, but

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it frequently fails from the surgeon and his assistants being unable by it to use a sufficient amount of force. The mechanical, on the other hand, I am persuaded, often fails from it being applied between two points which, during the attempt at reduction, remain fixed. It appears to me that the great value of the instrument, to which I wish to draw attention, arises from the fact that it combines the advantages of both the physical and mechanical methods of reduction, for while the direction of extension and counter-extension can be altered at will, it furnishes an extending force which is unlimited in principle. The indications, as mentioned by Jarvis, which this instrument is intended to fulfil are—

1. To establish a line of extension and counter-extension between any two described points, and to be enabled to change the direction of the force without any previous relaxation of it.

2. To furnish an extending force which is unlimited in principle, yet easily calculated, and which is perfectly subject to the will of the operator.

3. To be enabled to estimate with mathematical accuracy the amount of force used.

4. To enable the operator to apply the force, whether direct or transverse, either rapidly or slowly, and to retain it on the limb during his pleasure.

That a violation of mechanical principles in the application of force in the treatment of dislocations frequently occurs, and that this leads often to failure and sometimes to grave accidents, which seriously complicate the case, there can be no question, and one prime reason of the frequent occurrence of these failures and accidents has been to a great extent, as Jarvis has rightly shown, owing to the employment of forces which operate from fixed points over which the surgeon has no control. "Thus," he remarks, "if the line of extension happens to be the correct one, he (the surgeon) does not desire it to be changed, but if it happens to be incorrect the force must first be relaxed before he can change it." This difficulty, which the surgeon has often to contend with in attempting the reduction of dislocations, is chiefly evident in cases where the luxated extremity of the bone is driven into muscular tissues which tightly envelope or grasp it. Many illustrations of this might be adduced. I may mention one instance by Jarvis. He observes:—"Suppose the case where the head of the bone is driven into the soft tissues and the neck is closely embraced by them, as, for instance, in some cases of the head of the os humeri, we must first disengage the head before we can even hope

to succeed in reduction; suppose, also, we apply the pulleys; force is steadily and long continued, but owing to the firmness with which the neck is embraced, and the strength with which the muscles contract it is not relieved from its confinement. Is it not plain, therefore, that should the extending point now be subject to the will of the surgeon to move at pleasure, while the force is yet constant and steady, to give free motion to the limb would greatly aid him in reduction and that without increasing the power!"^a

Many other illustrations I might also mention, as, for example, in certain luxations of the femur where the head and neck are forced obliquely into the muscular tissues, which, tightly embracing the neck of the bone, must, most probably, have to be torn through and, in truth, often are in attempting to replace the bone in its normal position.

The apparatus, which I think goes far in getting rid of these difficulties and accidents, consists of a steel case of the dimensions of an ordinary gun-barrel, open at the upper surface and containing a rack-bar. At one extremity of the steel case the pinion wheel is fixed. The rack-bar constitutes the extending bar. The counter-extending-bar is fixed, not at the extremity of the rack-bar case, as in Jarvis's adjuster, but to the thigh fork, the shoulder collar, or the elbow fork. The shaft of the pinion wheel terminates in a square heel which fits into a corresponding square opening at the extremity of the lever, and which passes through the centre of a ratchet wheel which is fixed to one extremity of the lever. The rack-bar case is so adapted as to fit into the end of the counter-extending bar, and the two bars, the extending bar and the counter-extending-bar, are united by the dynamometer which is fixed by two hooks and which are close to the extremities of the two bars. The effect of turning the pinion wheel by the lever, is to increase the distance between the extending or rack-bar, and the counter-extending bar. This latter is attached, for luxations of the upper extremity of the humerus, to the shoulder-collar; for those of the elbow, to the elbow-fork; and for luxations of the femur, to the thigh-fork. These appliances can also be adapted to luxations occurring at the knee and other articulations.

With these few preliminary observations I may now give (and I shall do so with all possible-brevity), the notes of some cases of luxations which I have treated by this appliance.

^a Five Lectures on the Surgical Adjuster. By Geo. O. Jarvis. Weiss, London, 1846, p. 12.

CASE I.—*Dislocation of Head of Right Humerus Forwards—Reduction.*

Nora B., aged fifty-two, admitted into Richmond Hospital, under my care, on 6th June, 1870. The head of right humerus was displaced forwards; the injury resulted from a fall on her shoulder, which she sustained three hours before her admission. Chloroform was not employed, and the luxation was reduced in less than a minute, the force used not exceeding 100lbs.

CASE II.—*Dislocation into Axilla—Reduction.*

Richard L., aged fifty-eight, a strong, muscular man, admitted into the Richmond Hospital, under my care, on the 4th August. The injury occurred from the fall off a car. The luxation had occurred twenty-five hours previous to his admission into hospital. I applied the adjuster and at once reduced the luxation, the force used being 180 lbs. Before, however, I succeeded I had twice to alter the direction of the force by rotating the instrument, keeping up at the same time the extending force.

CASE III.—*Dislocation of both Bones of the Fore-arm Backwards—Reduction.*

Thomas C., aged eleven, admitted into the Richmond Hospital on August 7, 1870. The accident occurred from the patient slipping off a kerb-stone and falling. All the usual signs of the accident were present. I at once applied the adjuster and reduced the luxation. The force used was $101\frac{1}{4}$ lbs. For some days the patient suffered from acute inflammation of the joint, which, however, subsequently subsided, and on the 16th August the patient returned home perfectly well.

CASE IV.—*Dislocation of Head of Left Humerus Forwards—Reduction.*

P. Murray, aged forty-five, a strongly-built, muscular man, was admitted into the Richmond Hospital, under my care, on March 4, 1872. The patient stated the accident happened from a fall on the shoulder two days previous to his admission into hospital. Shortly after his admission I was sent for, and having applied the adjuster, I succeeded in reducing the luxation in less than a minute. A much greater force (242 lbs.) than is usually required to effect

reduction in this injury was found necessary. The following day the patient left the hospital, with directions to attend occasionally as an extern patient.

CASE V.—*Dislocation of Head of Humerus Forwards of four months' standing—Non-Reduction.*

J. B., aged fifty-two, admitted into Richmond Hospital, under my care, December 15, 1870. The accident happened from a fall on the elbow four months previous to his admission. The adjuster was applied by me, but in this case without success. I tried the other more ordinary methods, but did not succeed with them either.

CASE VI.—*Dislocation into Axilla of five weeks' standing—Non-Reduction.*

L. D., aged thirty-four, a strong, powerful young man, admitted into the Richmond Hospital, under my care, November 19, 1871. The accident occurred seven weeks previous to his admission. The accident was said to have occurred from a fall on the shoulder. The adjuster was applied in this case, but without success. The ropes and pulleys did not succeed in this case either.

CASE VII.—*Dislocation of Humerus Forwards of three days' standing—Adjuster applied, but owing to the Shoulder-Collar of the instrument being too small for the patient, recourse had to be made to the ropes and pulleys—Reduction.*

Thomas H., aged forty-four, admitted into the Richmond Hospital, under my care, on Jan. 22nd, 1871. The luxation was of three days' duration. The patient was a strong, powerfully-built man, of exceptionally great muscular development. I applied the adjuster, but experienced considerable difficulty in getting the collar to which the counter-extending bar is attached round the shoulder. In getting it round and above the joint the integuments and muscular tissues about the articulation were pushed before the collar, and, of course, a vast amount of the force applied was expended on these structures and not on the head of the displaced bone. This would not have been the case had the collar been larger, and a reduction would then, I have not the slightest doubt, have been easily accomplished. It must be remembered that this collar was manufactured with special reference to the French *physique*, and not for those exceptionally large and muscular persons that are occasionally the subject

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of observation in Ireland. On the 27th January I succeeded in reducing this luxation by means of ropes and pulleys.

CASE VIII.—*Dislocation into the Axilla—Reduction.*

P. D., aged forty-one, was admitted into the Richmond Hospital, last January, suffering from luxation into the axilla. The accident occurred from a fall the day previous to his admission. The adjuster was applied and a reduction effected.

CASE IX.—*Dislocation of both Bones of the Forearm Backwards of over three weeks' standing—the Adjuster applied and Reduction effected after two attempts.*

T. K., aged twenty-three, admitted into the Richmond Hospital, under my care, September 17, 1870. While out shooting, three weeks and three days previous to his admission, he tripped and fell on his elbow. There was not much pain at the time, but the elbow swelled rapidly. On examination, after his admission into hospital, the right forearm was found to be extended. As in the cases described by Mr. Stapleton, there was complete inability to flex it, and a considerable degree of lateral motion existed. Both bones could be felt posteriorly. Hand slightly pronated, cannot be supinated. Complains of great pain on making any examination of the joint. The first time (September 20) that an attempt at reduction was made, only a partial success attended our efforts—viz., the forearm was got into a better position, being partially flexed on the arm, but it was evident that the luxation was still unreduced. Four days subsequently, a second and more successful attempt was made, the force necessary for the reduction being 189 lbs. This was followed by very violent inflammation in the joint. It, however, soon subsided under the influence of suitable antiphlogistic measures, and although a good deal of stiffness remained in the joint at the time of the patient leaving hospital, yet, when he was brought under the influence of chloroform, perfect flexion and extension, as well as pronation and supination, could be produced.

CASE X.—*Dislocation of Head of Humerus into the Axilla—Reduction.* Reported by Mr. Mulock.

Charles Torkington, aged fifty-five, by occupation a cooper, was admitted into the Richmond Surgical Hospital, under Mr. Stokes' care, on September 22nd, 1872, suffering from a dislocation of the

head of the humerus into the axilla, which he stated he received about thirteen hours previously, in consequence of a fall on the shoulder. All the usual signs of the accident were present. Attempts were made to effect reduction without the aid of any mechanical appliance, but these failing—doubtless owing to the great muscularity of the patient—Mr. Stokes then adjusted Robert's apparatus, and, in sixty seconds from the time the instrument was applied, reduction was accomplished. The force used was equivalent to ninety kilogrammes. The following day the patient returned home.

CASE XI.—*Sub-coracoid Luxation—Reduction.* Case reported by Mr. Charles Gwynne.

James Doran, a cattle drover by occupation, was admitted into the Richmond Surgical Hospital, under Mr. Stokes' care, on November 6th, 1872, suffering from a dislocation of the head of the humerus below the coracoid process. The history of the case is as follows:—

At 9 a.m. of the same day he was driving two bulls to the market or fair of Wilkinstown; by some accident one of the bulls got one of its hind legs entangled in the hind legs of the other, and he went to separate them by catching one of them by a rope attached to a hook in its nose; whilst thus occupied something occurred to frighten the animal and caused it suddenly to start its head to one side, wrenching the arm of the man, Doran, with great violence, and throwing him to the ground, dislocating his arm in the manner aforementioned.

Between two and three hours after he arrived at the Richmond Hospital in Dublin, reduction was attempted by the usual methods, by the resident pupils on duty, but they were quite unsuccessful, owing, probably, to the extraordinary muscular development of the patient.

At 1.30 p.m. the patient was seen by Mr. Stokes, who at once determined on trying Robert's modification of Jarvis' apparatus. The result was most satisfactory, and placed beyond doubt the efficiency of the apparatus.

Some conception can be formed of the great muscularity of the patient, by the fact that it took a force equal to 130 kilogrammes, measured on the dynamometer attached to the instrument, to effect reduction of the dislocation.

CASE XII. — *Sub-coracoid Luxation — Reduction.* From notes taken by Mr. Charles Gwynne.

J. Gibbs, a powerfully built man, aged fifty-six, was admitted into the Richmond Surgical Hospital, under Mr. Stokes' care, on March 18th, 1873, suffering from a luxation of the right humerus beneath the coracoid process. On the previous evening he met with the accident which caused the dislocation, but, being at the time almost insensible from drink, he was unable to give any account of how it occurred.

When he presented himself next morning at the hospital, his shoulder presented all the usual signs of sub-coracoid dislocation. Shortly after his admission he was seen by Mr. Stokes, who at once applied Robert's luxation adjuster. In two and a half minutes after the apparatus was fixed the dislocation was reduced, the amount of force made use of, as marked by the dynamometer attached to the instrument, being equal to 250 lbs. The following day the patient returned home.

In the preceding cases I have given, as will be seen, those in which the adjuster did not succeed, as well as those in which it did. In two of the former cases, however, it will be remembered that the accident happened at a very considerable period previous to the attempt at reduction. In one case four months, and in the other seven weeks, and in the third case, owing to the large proportions of the patient, the instrument could not be satisfactorily adjusted.

I would be sorry to say that this apparatus should entirely supersede the older methods of reduction; but it is certainly of very great value as a "means the more" in the treatment of this all-important class of injuries. The results, too, obtained by Nélaton, Hamilton, and others, have shown that the adjuster, of which the one under consideration is a modification, and in many respects an improvement, is practically as well as theoretically superior, in certain cases, to the appliances and devices ordinarily made use of; and there can be no doubt that it certainly enables the surgeon to get rid of the effect of being confined to fixed points while applying the most powerful extension and counter-extension in the reduction of luxations. Objections may, perhaps, be raised to this instrument from its being so complicated and necessarily so costly, but such an objection hardly deserves a passing notice when we reflect that it enables the surgeon to get rid of a great difficulty which he has

always experienced in the treatment of some varieties of luxation—one which has often become quite insuperable, and forced him to abandon the attempt at reduction as wholly impracticable, and condemn the sufferer to be a hopeless cripple for life.

ART. VII.—*Case of Spontaneous Aneurism of Common Carotid Artery, left side—Ligature of Artery in Lower Stage of its Course—Cure of Aneurism.* By CHRISTOPHER FLEMING, M.D., Ex-President Royal College of Surgeons; Late Surgeon to the Richmond Hospital; Visiting Surgeon to Steevens' Hospital; Senior Member of the Court of Examiners, Royal College of Surgeons, Ireland, &c., &c.

SOME of the details of the following case, though it is of comparatively distant date, possess points of practical interest which appear to me to entitle them to a special record. The notes taken during the progress of the case in hospital, of which the following may be considered as a brief summary, have lately fallen under my observation.

A Welshman, aged forty years, an ostler by trade, was sent to me from North Wales, with a tumour on the left side of the neck, having many of the features of aneurism of the carotid artery. He was admitted into the Richmond Hospital in August, 1852. The tumour was about the size of a large orange, somewhat irregular in shape, and projected so much externally as to render the integuments covering it remarkably tense. It was imbedded behind the angle of the jaw, forcing the parotid gland upwards, and bulging into the fauces, where it could be seen and felt, pushing forward the left arch of the palate, and encroaching beyond the mesial line behind the pharynx and the upper part of the larynx. Posteriorly, it passed beyond the tube of the ear into the occipital region, where it distended outwards, the upper attachment of the sterno-mastoid muscle, its anterior margin advanced on the body of the jaw, about midway to the symphysis, and inferiorly it might be said to have been bounded by a line parallel with that of the lower edge of the cricoid cartilage. Its transverse measurement along the base of the jaw was five inches, and was increased about half an inch in the act of deglutition. Its vertical measurement along its central portion was about three inches. There is a cast of these several outlines in the