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A DESCRIPTION OF AN INSTRUMENT FOR THE REDUCTION OF DISLOCATIONS OF THE HIP-JOINT, WITH A REPORT OF TWO SUCCESSFUL CASES.

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The manner in which my attention has been drawn to the present subject, originated from having witnessed several dislocations of the hip-joint unreduced though the most rigorous and persevering means were resorted to, which had been suggested by the late Sir Astley Cooper, in his ever memorable work on dislocations and fractures of joints. I trust that it will not be considered arrogant or presumptuous on the part of an humble individual, like myself, almost excluded from the active scenes of a most useful and philanthropic calling, to review this important part of the labours of so great a man, who has done much in establishing the principles of surgery, and in raising it to its present high standard of perfection, many of whose doctrines will be handed down as legacies to posterity. It is far from my intention to utter anything disparaging or derogatory (were I enabled to do so,) to that lamented benefactor, for whose memory I have too much honour and respect. Nevertheless, a suggestion or introduction of any new plan, founded upon rational principles, for the relief of suffering humanity, from whatever source it may emanate, has strong claims upon the consideration of those engaged in like pursuits.

In the early part of my professional career, when a pupil of the Gloucester Infirmary, I witnessed two cases of dislocation of the hip-joint, where the usual therapeutics had failed, and I could not account for such disasters but from deficiency in the mechanical means employed. The first was a dislocation upwards and backwards into the ischiatic notch, the patient having undergone five different attempts at reduction; the second, a dislocation forwards upon the os pubis, submitted to three different extensions. The antiphlogistic treatment in both cases had been most strenuously enjoined, and the time occupied between each operation nine or ten days, to allow the swelling and shock which the system had sustained to subside. On the part of the surgeons, Messrs. Fletcher, sen., and Cother, (who were the surgeons of this institution at that time,) the greatest boldness and intrepidity combined with judgment were exercised, and in candour

and justice to those gentlemen, I must say, success ought to have crowned their efforts; yet withal, they were completely frustrated.

Afterwards, when a student of St. Bartholomew's Hospital, in October 1826, I witnessed a case of dislocation downwards into the foramen ovale, under the care of the late Mr. Earle. In this instance the result was more fortunate. The head of the bone was firmly fixed in its new situation, rendering rotation and mobility extremely difficult. Extension was made downwards. One grain of tartarized antimony in solution was given, and repeated every ten or fifteen minutes, which produced excessive nausea. The individual was under the force of pulleys between forty and fifty minutes, with occasional intervals. The appendages at the knee could not withstand the extending force, and required frequent re-adjustment. At this stage of the proceedings he was bled from the arm, and when approaching to a state of syncope, the affected limb being widely separated, was drawn across its fellow, and the disarticulated bone was immediately returned to the cotyloid cavity. I could not attribute this favourable termination to anything superior in the various manipulations and medicaments exhibited, to those used in the preceding instances; they were indeed open to the most palpable criticism, particularly the single pad slipping over the knee. It would ill become me to make any severe remark on one who is no more, respecting the *modus operandi*, which upon the occasion referred to, effected all that was required. Suffice it to say, that if I had the management of a luxation of the head of the femur downwards into the thyroid foramen, I should enforce extension upwards and somewhat outwards, which appears to me to be the most judicious.

I have had of late frequent opportunities of examining an old neglected accident of this kind, which has strengthened my opinion. In cases of dislocation generally, it is a matter of much moment to move the head of the bone from its new location, and it is no uncommon circumstance, though a wrong direction be given in the extension, for the adductor muscles to draw it into its pristine situation. I could enumerate many such instances which have come within my notice.

The objections to the remedial appliances, which are most frequently used in the displacement of the hip-joint, especially those necessitating extension downwards, appear to be the following,—1st, the pelvis is not made a complete fixture; 2nd, the single pad, just above the knee, buckled or tied by tapes, cannot withstand the force of pulleys; and, 3rd, in making the extension the hand is liable to fatigue, and it is

impossible to effect it in the same gradual and precise manner as by the means I have resorted to, and which I doubt not will be acknowledged by all competent authorities, to be the most eligible for the well-being of the patient.

In the treatment of this accident, where there is so much muscular power to contend against, for the extension to be rendered efficient, the pelvis should be immovably fixed to some unyielding substance, and it is equally important that the apparatus above the knee, to which one of the pulleys is attached, should retain its hold. I will, therefore, endeavour to exemplify the surgical mechanism I have employed, and which I think will supersede those in ordinary use.

In the first place the operator should have at his command a plank or planks of oak, beech, or elm, eight feet in length, three feet in width, and three inches in thickness, which should rest upon chairs, or upon tressels. If composed of two boards, they should be joined together by joists. Whatever position the patient is placed in, holes should be drilled in opposite directions, so that the ilia and unaffected thigh may be environed by two strong leather straps; cloths of any soft texture should be applied next the skin to prevent fretting, thus rendering the pelvis a complete fixture, enabling the effective means, the extension and uplifting the head of the femur to be used with the greatest advantage. 2nd. In cases of dislocation upwards on the dorsum ili, upwards and backwards into the ischiatic notch, and forwards on the body of the os pubis; to obviate the inconvenience of frequent re-adjustment, and much grievous annoyance, instead of the single pad above the knee, I have substituted two iron plates, fashioned to the configuration of the lower part of the thigh, just above the condyles, moveable by a joint, and on the other side fastened by two thumb-screws. That portion of the under plate which approaches the leg, should be turned back, in order to avoid the disagreeable consequences of pressure, the soft parts being previously protected by a wetted cloth, the leg bent, and held by an assistant, which serves to keep the instrument in juxta-position, as well as to produce flaccidity of the muscles. This metallic implement might be padded with wool, covered by wash-leather, at the discretion of the surgeon; for my own part I prefer it in the rough state. 3rd. At the distal extremity of the board, an upright post is fixed, twenty inches in height, and from three to four inches in thickness, through which there is a central hole for the pulley-rope to pass, and another laterally for a stick or windlass, which may be worked with cogs, or by a roller and ratchet wheel. One of the pulleys is attached to a hook in the front plate, and the other to a staple in the upright post. The cord of the pulleys must be tensely drawn, and the extension then commenced, which can be made in the most gradual manner. In the following cases which came under my immediate cognizance, I successfully employed the apparatus described:—

CASE I.

Robert Harding, aged 20, an athletic muscular young man, in the occupation of cow-man, at Dunley Farm, in the parish of Grittleton, Wilts, March 5th, 1832, was knocked down with considerable violence, whilst attempting to separate two cows from fighting, and was unable to rise from the ground. His master

immediately dispatched a messenger for me, and I hastened to the scene of accident as speedily as possible. He was in great pain about the right hip-joint, and lying upon the opposite side, dreading the slightest movement. Upon comparing the length of limbs in the erect posture, the right was from half an inch to an inch shorter than its fellow; the head of the thigh bone could be felt resting below the posterior inferior spinous process of the ilium, and upon the spinous process of the ischium, firmly locked; rotation could not be performed without much force; knee and foot turned inwards, the toes resting on the ground, and the heel elevated. He was submitted to the usual mode of treatment, being placed upon a flock-bed, a sheet passed beneath the perineum and fastened to a post; the lower part of the thigh was protected by a wetted cloth twisted round; the single pad in this situation was applied, and temporarily retained by tapes, to which one of the pulleys was connected by a ring in its front part, and the other to a staple in the wall; the limb was brought mid-way across the other, and extension commenced. One grain of tartarized antimony in solution was given every ten minutes. After he had been under the application of pulleys for an hour, he was bled very freely from the arm, but in consequence of the inefficiency of the extending power, the pad continually slipping over the knee, further attempts to remedy this accident were discontinued.

When I reached home I sent for an ingenious mechanic, who put my views into a systematic arrangement. During the intermediate time, cold evaporating lotions were ordered to the seat of injury, saline and antimonial aperients daily given, and he subsisted wholly upon slops, with a little bread crumbled in. At that time I was residing at Shorstone, on the borders of Wiltshire.

On the fourth day, (March 9th,) all things being in readiness, Messrs. Wickham, of Didmorton, and Marshall, late of Tetbury, Gloucestershire, were invited to witness the proceedings, and kindly lent their assistance. The patient was removed from a warm bath, placed upon a board on the left side, and the pelvis fixed; the metallic instrument was adjusted a little above the knee, the soft parts being previously protected by a wetted cloth; one of the pulleys was attached to a ring in the front part of the anterior plate, and the other to an upright post towards the end of the board, which corresponded with the long axis of the affected member; the thigh was brought across the middle of the other; the leg semi-flexed, and retained in position by an assistant; the pulley ropes were tensely drawn; extension commenced in a very slow and gradual manner, and after it had been kept up one minute, the return of the head of the femur to the acetabulum was heard by all in the room. The joint had assumed its natural appearance; the extremity moveable, and of the same length as the opposite. A bandage was placed across the ilia, immediately over each hip-joint, the knees were held together, and the individual carefully removed to bed. The case progressed in a very favourable manner, without any untoward symptoms, and he resumed his avocations in the space of three weeks.

CASE II.

James Fielder, aged 32, July 7th, 1845, a carpenter,

of middle stature, in the employ of the contractors of the Ely railway, was sitting on the tender of a steam-carriage, immediately behind a waggon which it was propelling; the tail board of the latter vehicle flew open, came in violent contact with the right knee, and forced the head of the femur out of its socket. Mr. Pearson, of Ely, was called in attendance, and tried the usual means without the desired effect. Late in the evening he requested my assistance for the next day, July 8th. I repaired to the spot, taking with me the iron plates already alluded to. I stated many of the difficulties individuals whom I had been associated with had experienced in the treatment of this accident, and the success which had attended my own practice some years ago. This gentleman coincided with my views, and being supplied with the necessary material, the other appendages were readily constructed. Examining the patient in the erect attitude, the affected limb was half an inch, or more, shorter than opposite; the knee and foot turned inwards; the trochanter major was more distant from the anterior superior spinous process of the ilium, and could be distinctly felt between the posterior inferior spinous process of the ilium, and the spinous process of the ischium. Rotation was attended with much pain, but there was greater mobility than in the preceding cases. The treatment was the same as in the last, commencing at the onset with two grains of tartarized antimony in solution. After the extension had been kept up about ten minutes, with occasional intermissions during pain, the head of the femur was heard to return to its wonted situation by the majority of persons in the room. I was afterwards informed that no unpleasant consequences followed, and he was enabled to resume his occupation in the course of a few weeks.

The joint belonging to the iron plates was proposed to me by a mechanic, who witnessed the proceedings of this case, which I consider adds to its convenience: hitherto this instrument had been fastened by two thumb screws on each side.

During the time I have been committing these observations to paper, a gentleman, endowed with much mechanical genius, viewing the latter appendage, made a very useful proposition. Instead of commencing the extension from a ring in the front plate, he recommended the addition of two strongholds or holes on each side, for a cord to be fastened and hitched to the pulley, which would render the force much more gradual and manageable.

As a general rule, I consider the line of direction in the reduction of the several dislocations of the hip-joint, laid down by the late Sir Astley Cooper, the best that can possibly be devised, no doubt occasionally requiring modification, as the head of the bone is not at all times so favorably located, being locked to some bony process, which tact and experience will readily dictate. The metallic implement for the attachment of one of the pulleys, will be found to be of eminent advantage in the re-adjustment of accidents of this kind, where the extension is required to be made downwards and outwards. I have nothing to add to the ordinary remedial agents employed in the displacement of the head of the femur downwards into the thyroid foramen, except that, in a recent case, where the articulating extremity of the bone cannot be moved from its new situation by uplifting it, and, at

the same time, making a lever of it, by carrying the affected member over its fellow, the same means can be tried more efficiently by having the pelvis fastened to the board, and, if the head of the bone cannot be raised by the efforts of the surgeon and assistants, extension upwards with the pulleys attached to a strap around the top of the thigh, approaching to a transverse line, would be effectually accomplished by having the upright post fixed at a convenient angle. The legs of the board and upright post or pillar might be made with screws, so that they can be removed as circumstances require.

Should this apparatus be approved by the surgeons of general hospitals, each institution ought to be provided with three or four pairs of the metallic plates of different sizes, that the instrument may be readily adjusted. To general practitioners, who are situated at too great a distance from an hospital, I would recommend each gentleman to have in his possession leather straps, a compound pulley, a pair of iron plates for middle stature, (two or three different sizes would be better,) and an upright post or pillar, which I will describe. Having these requisites at hand, the table or planks will be readily procured. The pillar is twenty inches in height from the refter, and three inches and a half in thickness, with a screw from five to seven inches long. At the base of the pillar is a flat piece of wood, which I have termed the refter, and a large wooden nut, moveable by two handles, the screw passing through the refter, a table or board, and the nut, by means of which the pillar is rendered a complete fixture. At the upper part is a mortise for the admission of a roller, moveable by a spindle and crank, the former acting upon an iron plate on each side of the post, passing through the centre of a ratchet wheel, and retained there by a small iron nut. In order to render traction continuous, there is a hole in the roller for one end of the pulley rope to pass through, which is fastened by a knot at its extreme point. A little below the mortise a metallic eye is fixed for the attachment of one of the pulleys. Gyration is regulated by the ratchet wheel, click, and spring. By depressing the click, retrocession and relaxation can be momentarily produced. Extension may be thus enforced to any degree, being completely under the control of the operator, and can be performed as rapidly, or slowly, as the circumstances of the case demand.

Before the special treatment is commenced in a strong athletic subject, or in displacement of long standing, the preparatory and accessory measures, I am convinced, are of the greatest moment,—viz., the warm bath, depletion, and nauseating doses of tartarized antimony, as tending to exhaust the muscles, checking undue reaction, and other perilous consequences, but the re-adaptation can only be looked for from the skilful ingenuity of the surgeon.

Diffidence is the only assignable excuse I can offer to the profession, for not having endeavoured to attract their attention to these remedial appliances before. Years have now rolled away, while the subject has been more or less thought of by me, which has only strengthened my impressions of their intrinsic value.

The greatest honour the healing art can have imparted to it is that of having alleviated the ills and pains of our fellow-creatures, and those who have witnessed the almost unbearable suffering of individuals

exposed to the ordinary treatment of this accident, I feel assured will agree with me, that the principles of treatment have not been sufficiently matured. I cannot imagine, if the surgical mechanism be well organized, that in the treatment of cases of this kind, the animal powers of man, under any circumstances, can withstand the immense power of pullies, more particularly under the discipline of a well regulated hand. These matters should be properly digested, for if unsuccessful in our efforts, the injured party is a living memento of the uncertainty of our calling, as permanent crippling is the sure and inevitable result.

[The apparatus, and mode of applying it, were exhibited by Mr. Davie in an adjacent room, as well as an ingenious model of the apparatus in operation.]

OBSERVATIONS ON THE USE OF IRON IN DISEASES OF THE HEART.

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TO THE EDITOR OF THE PROVINCIAL MEDICAL AND SURGICAL JOURNAL.

SIR,

In compliance with your wish,—“to learn the result of my experience on the use of the chalybeate in diseased conditions of the heart,”—I proceed briefly to make a few observations. The effects of iron in functional and structural lesions of the central organ of the circulation, may be stated conjointly, to avoid unnecessary length.

It may be questioned if our increased attention to physical diagnosis at the present day, be not in some measure pursued with a too exclusive bias, to the neglect, or inadequate appreciation, of those subtle elements of disease, collected from a more comprehensive view of the animal economy. Re-action ever leads to erroneous conclusions, if carried beyond its legitimate boundary. Of vital manifestations, the evolution of *power*, whether evinced in thought or action, is a subject of primary importance to the physician; as amid the numerous aberrations of our frame, this element of life,—whether *plus* or *minus*,—must always assume the most prominent position in all measures calculated to ward off a fatal result. If any *physical* element of the system deserves to be considered *alive*, the blood may well be deemed so, whether we view it relatively to the order of its appearance in point of time or reason. It alone pervades all structures;—through its influence disease becomes palpable;—by it, for the most part, must the nervous power be elicited to sustain life when ebbing. The relation, according to Baron Liebig, which the iron of the red blood-disks holds to the vital air inspired at every breath, places it only second in importance to the oxygen with which the metal is united in the circulating fluid, and at once suggests an obvious mode of restoring it to its normal standard, thereby again placing the organs severally in that harmonious relation by which health is maintained. Premising these few remarks, and bearing in mind the inferences flowing from them, the indications in cardiac diseases amenable to chalybeates,—which are such as prior to experience would be anticipated—may be concisely stated.

When the blood has become impoverished, the heart's texture attenuated, with manifest debility of the system at large, my observation would decidedly lead to the administration of chalybeates, whether nosologists might term the disease functional or structural.

Of *functional* or *nervous* affections of the heart, the forms in which I have found iron beneficial, are as follow:—

Palpitation, especially if sympathetic of dyspepsia, uterine derangements, hysterical or other nervous maladies, and when manifestly attended with the anæmic state, arising in persons of a lymphatic or nervous temperament, and relaxed habit. Tendency to syncope, with much precordial anxiety, to be attributed to deficient energy, referrible to a generally depressed condition of the nervous system, in which the heart participates in common with other parts of the system, to impoverished blood, or to sympathy with associated organs; the anæmic state being likewise well marked. Angina pectoris, when apparently not arising from, or connected with, structural alteration; or, if thus associated, partaking of a passive character.

Amongst the class of *structural* diseases, I may mention passive dilatation, with a normal or attenuated state of the parietes, or with predominance of dilatation over hypertrophy,—more immediately indicated by quick and clear cardiac sounds; and dropsical affections consecutive to this disease, attended with leaden or pallid and tumid countenance, paroxysms of orthopnoea or syncope, and copious expectoration.

In all these diseased conditions of the heart, chalybeates exert a very happy action; but I feel more disposed to use artificial preparations of iron in passive enlargement of the heart, repletion of the vascular system being liable to ensue from the chalybeate water. The general powers of the system unquestionably demand primary attention. In these cases, however, particular indications may require modified or collateral treatment, and I have never regretted the exhibition of iron, in conjunction, of course, with the influence of a bracing dry atmosphere, &c. As the eminent founder of our Association has well remarked, the most judicious course to pursue will be to support the function of innervation, (which invariably suffers, and often to an alarming extent,) by improving the quality of the blood. Of two evils, I am disposed to consider mechanical lesion of less moment than direct loss of power in the muscular walls of the heart, whence the prostration of the system more immediately proceeds. Indeed, it is a subject of significant import, to observe with what tenacity life will cling to an individual whose heart may have undergone extensive and irreparable injury, provided his impoverished blood admits of re-construction, and the general powers be duly maintained.

In no department of therapeutics is there greater occasion for sound physiological views of the animal economy, *as a whole*, than in cardiac affections, in which the nicest discrimination may be required to decide where lowering the system must be abandoned, and tonic treatment had recourse to; but I believe the former plan has often been productive of fatal consequences, especially in a cachectic habit of body, from inadvertent or partial observation leading to routine practice. I have used iron with decided advantage in