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CLINICAL LECTURES ON DISLOCATIONS,
DELIVERED AT THE CHARING CROSS
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By HENRY HANCOCK, Esq., Surgeon to the Hospital.

LECTURE I.

GENTLEMEN,

I have selected the subject of dislocations for this course of clinical lectures, as though there is scarcely any accident upon which so much has been written, there is no point in surgery of greater importance and no subject by which you are more likely either to make or mar your prospects, than by the one under consideration. An error in treatment or diagnosis cannot be concealed. You cannot reason an individual, use what sophistry you may, into the belief that you have done your duty by him, when he finds that he loses the use of a limb. He falls down, for instance, on his elbow, hand, or shoulder, and when he gets up he cannot use his arm. He consults you, and you, probably from not understanding the case, or perhaps from not having had opportunities of judging for yourselves, are ignorant of the nature of the accident. You prescribe, but your patient experiencing no relief, finding that the limb remains useless, consults another surgeon; he, better informed, at once pronounces the nature of the mischief, and what is of much more importance to your patient, reduces the dislocation, and restores the functions of the limb. Now, here is no ideal picture; it is an error which has fallen under my notice more than once, and unfortunately for you, it is one in which your ignorance cannot be concealed; there is the unanswerable fact, the bone was dislocated, you have mistaken the case, and another has removed the mischief, and restored the patient to comfort and health. Under these circumstances you will, I am sure, agree with me, that the subject under notice deserves our most attentive consideration, and ought to be viewed under all its bearings.

The facts hitherto published, with the exception of those contained in the valuable works of the late Sir A. Cooper, M. Boyer, and some few others, are for the most part isolated, each gentleman selecting an individual accident, and thus contributing to our knowledge of the whole; but it will be my duty and endeavour in these lectures to place before you, as clearly and succinctly as lies in my power, the several dislocations to which the human frame is liable, the accidents for which they may be mistaken, the results of these accidents—in a word, everything connected with them, so that I trust when we have completed our investigations, you

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will have a good general knowledge of everything connected with the subject.

In investigating this point there has always appeared to me to be a great deficiency in the manner in which it has been treated. Authors describe dislocations, but they do not describe the anatomy of the parts; they do not give the structures, or functions of the structures, which enter into the formation of the joints, which are liable to these accidents; neither do they give the appearances which these parts present in their normal condition. You will doubtless say that you know a man's shoulder to be sound and of its proper shape when you see it, but can you tell upon what you ground your opinion? You doubtlessly know the anatomy considered abstractedly, but it is one thing to know the mere dry detailed anatomy, and another to understand the form and appearance of a joint in its healthy state, and to know the landmarks or distinguishing features by which you can recognize whether the parts entering into its formation are in a state of integrity or not, and whether they are in their proper and natural position. Before entering on the consideration of the individual dislocations, I purpose in these lectures to bring before you the different varieties of joints met with in the human frame, the several motions enjoyed by these joints, and the different structures entering into their formation. I shall then take a general view of dislocations, with their peculiarities, and subsequently proceed to treat seriatim of dislocations incident to individual joints.

The term joint, in surgery, is intended to denote the union of two or more bones at their articulating surfaces by connecting media, in such a manner as to allow a certain degree of motion, the extent of that motion varying with the shape of the articulating surfaces as adapted to the functions of the limb or part in which this union occurs. These joints are also termed diarthroses, or moveable articulations, and it is to them that we refer when we speak of dislocation, as the displacement of either of the bones entering thereinto constitutes that accident. With the exception of the lower jaw these joints are confined to the trunk and extremities, and consequently, with this exception, it is in those situations that the dislocations occur.

The different joints described under the head "diarthrosis," present certain peculiarities with which it is necessary you should be acquainted; I will therefore briefly refer to them here, although I shall have to discuss the point more fully when we come to the accidents occurring to these particular joints. In some species, as in the superior tibio-fibular, or the carpo-metacarpal articulations, where the surfaces

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are plane, or one is slightly convex and the other concave, the joint is called arthrodia. In others, as the ball and socket, where the ball or head of one bone is received in a socket or cup formed either in one or more bones, as in the hip or shoulder, it constitutes an enarthrosis. Again, where the articulating surfaces are marked by depressions and elevations which exactly fit into each other, and where the projecting processes are so arranged (as in the elbow joint) as to form a complete hinge, allowing only motion of extension and flexion, you have a ginglymus, and lastly, you have the rotatory diarthrosis, also called lateral ginglymus, where the head or pivot of a bone works in a ring formed partly of bone and partly of ligament, as between the first and second vertebræ, and the upper radio-ulnar articulation.

The motions enjoyed by diarthrodial joints, are those of gliding, flexion, extension, abduction, adduction, circumduction, and rotation. Of these motions, that of gliding, though peculiar to some joints, is nearly common to them all. In the arthrodial, as in the articulation of the carpus, tarsus, sternal and scapular ends of the clavicle, &c., the motion is gliding. The ginglymoid joints admit only of flexion and extension, whilst the enarthrodial are endowed with all these various motions.

The bones of the head and face are for the greater part joined together by immovable articulation, receiving various appellations according to the mode of union and shape of the articulating surfaces; hence you have sutures of various kinds, viz., the tooth-shaped, "*sutura dentata*;" like the teeth of a saw, "*sutura serrata*;" one bone overlapping the other, the edges being bevelled off, and "*sutura squamosa*;" the dove-tailed or sagittal suture. Also the mere apposition of bones, or the union termed *harmonia*; in some cases a ridge of bone is received into a groove in another bone, constituting *schindylesis*, whilst in others, again, where a conical surface is received into a corresponding cavity, the term *gomphosis* is employed. These various articulations are all classified under the general denomination "*synarthrosis*."

We do not apply the term dislocation to a giving way of the sutures of the cranium or face; these accidents cannot be ascertained with any degree of certainty during life, and moreover, though a suture may yield, and a separation take place, it rarely, if ever, occurs to such an extent, as to produce displacement or dislocation of any of the bones, or to allow of such alteration in the relative position of these bones one to the other, as to destroy the functions of the parts contained therein. Of course, I do not here intend you to understand that the cranial or facial bones are never displaced, but this is commonly the result of fracture causing rarely, if ever, so complete a separation of the articulations, as to constitute a dislocation.

Again, there is a third class of articulations, partaking of the character of the other two, and from its mixed form called *amphiarthrosis*; examples of this class are found in the symphysis pubis, and the ilio-sacral articulation, and like the *synarthrodial* articulations, are liable to become obliterated by age.

The structures which enter into the formation of joints are, bone, cartilage, fibro cartilage, ligaments, and synovial membrane.

In the human subject, the fundamental portion of

an articulation consists of bone. On the separated bones of the skeleton we perceive at some point or other a smooth shining surface, which corresponds with a similar process on another bone. There is no subject in anatomy in which the adaptation of means to an end is more forcibly displayed than in the construction of the skeleton, and in the application of its component parts to their several functions, and I may add there are no objects more worthy our observation than the arrangement of the osseous structure of the articulations. How should we be exposed almost at every step to concussions and shocks were it not for the beautiful arrangement of the tarsal bones, and the nature of their structure. Again, in that string of joints which constitutes the spinal column, the bones not only enter into those joints, but collectively form a case for the spinal marrow, and canals for the transmission of those nerves by which the body is endowed with sensation and motion; and here again we observe the same protection from concussions in the spongy reticular structure of the bones themselves.

In the long bones of the extremities it is necessary to obtain an enlarged surface for articulation, and accordingly we find their extremities expanded, not by any addition of substance, or by increasing the weight, but by a different arrangement of the reticular structure. In the shaft of the long bones where solidity is so requisite, the reticular structure is condensed into hard compact laminae; whereas, in their extremities where expansion and a certain degree of elasticity are required, the reticular structure is abundant, not condensed but cellular, and covered merely by a thin lamina of compact tissue. Cast your eyes over the whole of the moveable joints of the skeleton, and you will find the same admirable arrangement pervades throughout.

In the neighbourhood of the joints, the bones are marked by elevations, processes and depressions, indicating the points to which the connecting ligaments, &c., are attached.

But you must remember that, until the body is fully developed, the extremities of the long bones or their epiphyses are not united to the shafts by ossific union, and therefore among children you will occasionally meet with accidents which, unless you bear this in mind, will undoubtedly puzzle you.

Cartilage. The cartilages found in the joints have been classified by anatomists into those investing the articulating surfaces of the bones of moveable joints or diarthrodial cartilages; those placed between the bones of immoveable articulations, or *synarthrodial* cartilages; interarticular fibro-cartilages; the circular fibro-cartilage of Meckel, and the intervertebral fibro-cartilages.

The articular or diarthrodial cartilages correspond precisely with the shape of the articulating extremities of the long bones; they are entirely distinct from the temporary cartilages constituting the epiphyses of these bones, and may by maceration be separated from them. Hence, these cartilages have been called the "*cartilages of incrustation*." The design of articular cartilages is evidently to carry out to a greater extent the beautiful arrangement to which I have already alluded in speaking of the bones; by the smoothness of their free surfaces they move one upon another without any risk of abrasion, whilst, by their flexibility and elasti-

city, the violence of any shock referred to these parts is broken, and is finally expended.

The articular cartilages are composed of perpendicular fibres, and their thickness in every case is in relation to the pressure which they have to support. This thickness is always greatest on the most prominent or convex portion of the heads of the bones, whilst the opposite arrangement obtains in the cavities, as in these situations it is thinnest in the centre, gradually increasing towards the circumference.

A difference of opinion exists as to the organisation of cartilage, some affirming that it does not belong to the class of organized tissues, whilst others on the contrary consider that it possesses vessels and nerves, and that it is to a certain extent capable of repairing injuries inflicted upon it. Among the former, M. Velpeau asserts that it is never the original seat of disease, that it neither inflames nor suppurates, and he somewhat ridicules the idea of its ulceration as described by Sir Benjamin Brodie, denying the fact, and maintaining that the ulceration commences in the bone, and not in the cartilage. It is exceedingly difficult to reconcile this opinion with what pathology almost daily points out. If the articular cartilages are like the nails, inorganised, without receiving any nourishment from their own blood-vessels, whence are they derived? and how are they nourished? We know that although the nails are said to be inorganised, there is a special apparatus (the matrix) whence they originate, and by which their growth is continued; but we have no special apparatus in the joints for the secretion of cartilage. If the cartilages be not organised, how do they increase with the growth of the body? However, both anatomy and pathology concur in confirming the fact of cartilages being organized like bone, although, perhaps, in a minor degree. If we examine the articular cartilage of a child under a microscope, we observe distinct canals for the passage of blood, although it does not appear that these canals possess the different coverings of vessels, but this fact by no means proves the absence of blood-vessels; if it did, we might then deny the fact of the bones of the cranium being supplied by blood-vessels, as in this latter situation their investments are so thin as to be, in some instances, scarcely recognizable. Neither is it any proof against the organisation of cartilage, that it possesses no sensibility in the healthy state. Those who maintain this argument refer to the experiments of Haller, who applied sulphuric acid to the hip joint, and also cut it without producing pain; but the same immunity from pain is observed in healthy bone, and no one doubts the fact of that tissue being highly organised; and, moreover, the pain which patients, who suffer from ulceration of the cartilages, experience, is sometimes most intense, as you will have the opportunity of observing for yourselves in cases which you will meet with in your practice.

It is true that in the adult, these canals for the distribution of blood are not perceptible, but as Sir Benjamin Brodie has observed, this proves that they are very minute, but not that they are altogether wanting. In the cornea and sclerotic coat of the eye, we know that there are a set of vessels (the *vasa serosa*) too minute in their normal state to admit the coloured particles of the blood, but which, under disease, become dilated and injected with red blood, and may

be observed ramifying in these structures; and in the excellent work of Sir Benjamin Brodie upon the pathology of the joints, we have a case related in which vessels carrying red blood could be distinctly traced extending from the diseased bone to the cartilage covering it.

Sir B. Brodie has also pointed out that occasionally some portion of the articular cartilage is altered from its natural organization, and converted into a number of ligamentous fibres. It may be asked, can this change take place without some vascular apparatus being inherent in cartilages? and although M. Velpeau declares that the ulceration commences in the bone, and not in the cartilage, how many cases do we meet with in which the ulceration of the cartilage has evidently commenced on its free surface without extending to the bone, from which it can scarcely be separated, and which remains healthy? Now this never could be the case were M. Velpeau's hypothesis correct. Before I leave this point I would strongly recommend you to read Sir B. Brodie's work on the diseases of the joints, and judge for yourselves. Your trouble will be strongly repaid, as it is not made up of opinions formed from theory, but is the result of observation, and the just appreciation of facts.

Synarthrodial cartilages appear to form a bond of union between bones, and at the same time to diminish shocks, &c. They are mere laminae placed between two bones, which they not only separate, but join together, by adhering intimately to each bone, and to the ligamentous bands which pass from one bone to the other. These cartilages are for the most part conical, or, rather, wedge shaped, the external margins being thicker than their internal, a circumstance which, according to Meckel, accounts for the sutures on the inside of the cranium becoming obliterated sooner than those on the outside.

Fibro-cartilages are intermediate in form and structure to ligaments and cartilages; they consist of a fibrous base in the intervals of which is deposited cartilaginous substance. They are arranged into three classes, viz., those situated within the joints, or the interarticular; those surrounding cavities which Meckel designates the fibro-cartilage of circumference, or cylindrical fibro-cartilage; and, lastly, those placed between the bodies of the vertebrae or the intervertebral fibro-cartilage. The interarticular fibro-cartilages are peculiar to the sterno-clavicular, tempero-maxillary, and femero-tibial, articulations; they are occasionally met with in the acromio-clavicular joint. Their form is very variable, commonly representing a kind of plate, sometimes a double convex, and at others being perforated in the centre. As they are always met with in those joints subject to the most constant motion, and which have also to sustain great pressure, it would appear that they are intended to prevent friction and abrasion, but in the knee joint they also seem to deepen the cavities on the head of the tibia, whilst in the knee and jaw they serve to ensure a perfect adaptation of the articular surfaces one to the other in all the motions of the joint. Occasionally, however, these fibro-cartilages of the knee joint become displaced, depriving the patient for the time of the use of the limb, and producing great suffering. They are exceedingly elastic, and resist violence to a remarkable degree. The fibro-cartilages of circumference are only met with in the

shoulder and hip joints; in the former, surrounding the glenoid cavity; in the latter, the acetabulum, with the exception of the cotyloid notch.

The third class of fibro-cartilages are those placed between the bones of the vertebrae, acting as elastic cushions, in preventing concussion, and thus preserving the delicate spinal marrow from those shocks which must of necessity be continually occurring were it not for this contrivance. The arrangement of their structure is different from that of the other fibro-cartilages; they are thickest in the middle. The fibrous tissue is disposed in concentric layers, each layer being formed of interlacing fibres, having their interstices filled with cartilaginous substance; towards the centre the fibrous structure gradually disappears, leaving a soft pulpy mass, adapting itself to every motion of the vertebral column. These fibro-cartilages are firmly attached to the bones immediately above and below them, and also to the connecting ligamentous fibres; and although from this arrangement but very little, if any, motion is admitted between any two of the bones, still there results in the aggregate an elastic flexible column, in every way fitted to the very important duties it has to discharge in the animal economy. These pads or cushions are not only very elastic, but they possess a remarkable power of resistance to pressure, as you may see in this preparation which I now show you.

The patient from whom it was taken was the porter of this hospital, and had suffered for several years from aneurism of the descending aorta, which ultimately destroyed him. You may perceive the bones have been absorbed to a considerable extent, but the intervertebral substances remain entire, having resisted that pressure which destroyed the harder and less yielding tissue.

In our next lecture we will resume the consideration of the tissues entering into the formation of joints.

CASE OF EXCISION OF THE GREATER PORTION OF THE ULNA.

By WILLIAM MC. EWEN, Esq., House Surgeon to the Chester Infirmary, and Surgeon to Chester Castle, &c.

(Read before the Provincial Medical and Surgical Association, August 8, 1844.)

Thomas Griffiths, aged 19, apprentice to a marble mason, states that in the beginning of February, 1843, three of the men were lowering a large block of stone, and he was assisting them with a crow-bar. The stone being too heavy, came down suddenly, and knocked him down, his right arm being under the crow-bar, from which he could not get released until the stone was removed, which was done as speedily as possible.

He was able however to continue his employment for a fortnight after, though complaining much of his arm, which was very painful and a little swelled. He applied to a surgeon, who ordered leeches to his arm, and afterwards cold applications, with rest. This treatment was followed up for a week. The leech bites became a little inflamed, but after soothing applications got better, the arm being much relieved. His eyes then became inflamed, and the attention of

his medical attendant was chiefly directed to them, the arm being allowed to rest.

In May, his eyes gradually got better, but his arm again became very painful, red, and swelled. Blistering and other topical applications were used until August, when he was recommended to try sea bathing; after a time however, he returned home, without having received any benefit.

Shortly after Christmas an abscess on the outer side of the arm burst, and discharged freely, poultices and fomentations being applied daily.

In the beginning of March, 1844, he applied to me to know whether anything could be done; his general health was giving way rapidly, as evinced by night perspirations, loss of appetite, and muscular power, under the irritation and discharge from the arm, which presented the following appearance:—

About an inch above the right wrist there was a large sloughing ulcer, extending half way round the arm, exposing the shaft of the ulna to the extent of rather more than an inch, the exposed portion of bone having a whitish, worm-eaten appearance. The skin and cellular tissue for a considerable space around the ulcer were of a dull livid colour, and the muscles so matted together as to prevent motion of the wrist and hand, which was half closed. The margin of the ulcer was ragged, and had an irritable and angry appearance, and was extremely sensitive and painful. The ulcerative process was rapidly extending itself round the arm. Several sinuses communicated with the ulcer: in one the probe could be passed along the bone near to the olecranon; another passed down close to the articulation of the wrist.

The discharge from the ulcer was extremely offensive, and of a thick whitish consistence.

Before adopting any operative procedure, the system required to be put in order. The digestive organs were carefully attended to, and quinine administered with sulphuric acid, which improved his appetite and reduced the night perspirations; still it was evident the system could only be temporarily benefitted so long as the source of irritation remained.

After mature deliberation I proposed to remove the diseased portion of bone, which he willingly submitted to. Before doing so, I had written to my friend, Professor Fergusson, of King's College, as to the propriety of removing the bone at its articulation at the wrist, if it should be found that the disease had not extended so low. He, in reply, advised me to remove the articulating surface, as there might be a possibility, if that small portion only was left, that it might die for want of nutrition.

Coinciding in his opinion, on the 15th of March I proceeded in the following manner:—

The patient being seated in an arm chair, an assistant held the arm semiflexed, and with a common scalpel I carried an incision from the upper part of the ulcer along the outer edge of the ulna, to within three inches of the point of the olecranon. The bone being my guide, I dissected away the attachments of the muscles first along the outer, and then along the inner edge of the bone, making in fact two flaps.

The diseased portion of bone being now exposed to the extent of three inches, from the upper end of the ulcer, the periosteum was here found very much