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The Scudder Oration on Trauma:

CERVICAL SPONDYLOSIS, A SOURCE OF PAIN, PARESTHESIAS, PARALYSIS, AND PLAINTIFFS - IS IT TRAUMATIC?

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The high honor of giving the Scudder Oration is at once a pleasing, humbling, and a challenging experience. It is highly pleasing, for the invitation eminates from the Committee on Trauma, a group whose approbation I would most want to deserve, for it is among the members of this committee that I have over the years found my most provocative and exciting friends.

It is a humbling experience, for one finds his own record projected not only against that of those eminent people to whom you have previously accorded this honor, but also against the achievements of this committee. When I view my own efforts in this light, all bombasty flees my soul.

It is challenging, for I know that the invitation carries with it the charge that what is said here should not detract from the cause which you have so well advanced. Moreover, I know that the ghost of Dr. Scudder monitors this occasion. It was not my privilege to know Dr. Scudder personally, but from the written record and from folk lore, I am convinced that he shared the philosophy of Hippocrates as expressed in the aphorism which read, "The doctor must be prepared not only to do what is right himself, but also to make the patients, the externals, and the attendants cooperate." In the field of trauma, the patients are those who are injured; they may or may not have had prodromal changes. The externals are those who, though they may not become patients themselves, have contributed in some way to the injury of the patients. The attendants are those who make, enforce, and ajudicate the laws that determine the parameters of patient care.

Through education and persuasion, Dr. Scudder and his disciples have made the attendants cooperate in many ways. For instance, functional anatomy is required knowledge of all who would treat fractures. Surgical materials, especially metals, must meet uniformly high standards. The principles of transportation of the injured are known to every school child and are required knowledge of every professional. The manufacturers of automobiles today package the passengers more safely. The

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emergency rooms of this nation are, or soon will be, prepared to deal with all emergencies. Indeed, proper immediate care, definitive care, and rehabilitation are, or should be, available to all who are injured.

The challenge of this invitation has led me to search my own experience for material which would compliment the occasion, and I have chosen to speak to you about cervical spondylosis. Cervical spondylosis is simply defined as "a condition of the cervical spine". By common usage, however, it has been accepted as the term to identify the bony spurs or osteophytes, the calcification of ligaments about the spinal joints, the narrowing of the joint spaces, and indeed the ankylosis which develops in response to any pathology of a joint. These changes appear to be a part of the repair process which attends all disease, with changes in the discs perhaps the most common factor.

Cervical spondylosis is a common source of pain, of paresthesias, of paralysis, and of plaintiffs. It is a subject which has consumed much of my time, energy, and interest for more than twenty years. On many occasions during those years I have been asked on the one hand to testify that the disorder and/or the symptoms which accompany it are the result of trauma or at least were aggravated by trauma. Conversely, many have sought my opinion with the hope that I would be able to support the premise that the disease was a natural process or existed prior to the industrial or vehicular eruption which the patient considered responsible for his plight.

I have, however, never been able with absolute certainty to support either viewpoint in any instance, and only rarely have been able in any particular case to mobilize enough evidence to speak to these questions with even "reasonable medical certainty". Moreover, a search of the literature and my own experience convinces me that the true answers to these questions will not be found in open court under the adversary system - at least in the light of our present knowledge of the disease.

We are urgently in need of the cooperation of the patients, the externals, and the attendants in this area, for it is a disease where even under the most ideal circumstances, accurate diagnosis and the proper choice of treatment is difficult, but the emotional changes which accompany conflict increase the problem of diagnosis and treatment, and render rehabilitation tedius.

And the rascal who coined the term "whiplash", whoever he is, has not simplified this matter. Inaccurate and mischevious as this word is, however, I believe we are stuck with it! At least I am unable to come up with a meaningful substitute. For the phenomenon or action of a weight at the top of a flexible support, engineers tell me "cantilever" is the best term, whether used as a noun, verb, or adjective. However, anyone who proposed that this replace "whiplash" would be laughed out of this hall, but take heart - the meaning of words do mutate! The word "pituitary", for example, now identifies the master gland, the triggering agent of the entire hormonal system; yet the specific meaning of the word is "spit", which is the function that early investigators attributed to it!

To the extent that we can clarify the disorders which result from tortion of the neck, the significance of "whiplash" in tort will diminish.

It is my plan today to inquire into the role of trauma in cervical spondylosis, to outline a method of management for patients who suffer with this disorder, and to launch an appeal for change in our methods of adjudication of disability claims as it applies to cervical spondylosis in particular and also to traumatic disability in general. Before beginning this inquiry, however, let me assure this audience that this is not an attack on our courts, but it is my judgment that the framers of our methods of jurisprudence could not have anticipated that the presence or absence of disease, or the degree of disability which results from disease, would be assessed in this way.

Nor do I hold any issue with advocates, whether for the plaintiff or the defendant. Any prejudice I may have held in my youth in this regard has been erased by the full knowledge that it is not only the right but the duty of the advocate to insure that all evidence favorable to his client is heard. Also, let me emphasize at the outset that I have found few malingers among the patients who have sought treatment from me or who have been examined by me at the request of the defendant. Those who do malinger are glaringly apparent to the experienced physician and should be exposed.

On the other hand, the absence of demonstratable evidence of organic disease or the presence of psychogenic phenomena are not necessarily indicative of malingering or lack of suffering on the part of the patient. I share the view of the late Sir Edward Appleton, the eminent physicist, who said, "Though I am not a doctor, somehow I think there must be something the matter with the man who goes to the doctor when there is nothing the matter with him."

The preponderance of opinion on the pathogenesis of spondylosis in general, and of cervical spondylosis in particular, supports the thesis that trauma is the etiologic agent in most cases. Indeed, a massive literature on the intervertebral disc and its surrounding structures has developed during the last thirty years. In 1929 only five papers on this subject were listed in the Index Medicus. By 1961 Rabinovitch was able to find 2303, most of them supporting the concept that injury was the causative factor. Yet review of most of these papers reveal little conclusive evidence in support of the argument except the patient's statement that the symptoms began or were aggravated by a specific trauma.

The scientific method requires that as many variables as possible be isolated from any study, and with this thought in mind we have reviewed our own case material and find that in the past ten years more than 1,000 patients have presented themselves with complaints in which we feel we have verified cervical spondylosis as the cause. Approximately 85% of these related the onset of their symptoms to specific injury; 15% did not.

Approximately 20% were involved in accidents in which industrial compensation or the recovery of money for personal injury were not an issue.

In these 15% of cases, trauma can be excluded as an immediate causative agent. It is reasonable, therefore, to assume that in these some systemic disease must have existed which predisposed to the joint changes which were associated with the disabling symptoms in this group.

There is very little evidence from experiments on the spine itself which would cast light on this question. If it is permissible to transpose the data which has been gained from the study of cartilage and bone in general to a study of the joints of the human spine, a conclusive argument could be made that disorders of the hormonal system, the enzymal system, as well as infectious and hereditary diseases play a part in the production of this condition.

It has been presumed that trauma in some way changes the nutrition of the tissues of the joints, particularly of the nucleus pulposis, and that as a result of the normal inhibiting influence of cartilage upon bone growth, bony spurs or osteophytes develop about the joint as a part of nature's effort to stabilize the joint.

What little experimental evidence there is has been derived by testing the joints of animals with trauma. Rabinovitch,[1] working on the lumbar spine of adolescent monkeys, was able to remove the nucleus pulposis by aspiration and to produce spondylosis; i.e. after withdrawal of the nucleus pulposis, repeated x-rays and autopsy of the adolescent Rhesus Macaca showed spondylosis to be present. In five additional animals, more extensive trauma to the joint produced more extensive changes in proportion to the degree of trauma. He found also that if all the cartilage within a joint were removed, bone growth across the joint space began promptly and ended within a short time with firm fusion without excess spur formation. This type of trauma was followed by progressive narrowing as confirmed by repeated x-ray examinations and postmortem examination.

Sheridan and I have applied the experiments outlined by Rabinovitch to the cervical spine of 12 adult monkeys. We were, however, unable to remove the nucleus pulposis by aspiration as reported by Rabinovitch. The three animals on whom this technique was tried were followed for ten months by repeated x-rays and then were sacrificed. No changes were noted in or about the joints either by x-ray or at autopsy.

In three additional animals Sharpey's fibers, which bound the annulis fibrosis and moor the disc in place, were divided at the point of emergence from the body of the vertebrae. None of these three animals showed changes, either by x-ray or at autopsy.

In six animals, the disc, or parts of it, were removed. Repeated x-ray examinations over a ten months period in this group did show progressive narrowing of the bone space. Four of these animals have now been sacrificed. Post-mortem examination confirms the narrowing of the bone space but shows no proliferation about the joint.

These data are scant and do not permit firm conclusions, but it is possible to state that the reaction of the cervical spine in the adult Rhesus Macaca in Cincinnati differs from that of the lumbar spine of adolescent Rhesus Macaca in Montreal. They also invite the poignant question as to whether immature tissues are more vulnerable to trauma than adult tissues, and leads one to wonder whether the changes which we note in x-rays in adult life may indeed result from insults to juvenile tissues in youth. The fact that a high percentage of patients who present themselves with symptoms referable to one joint also show involvement of multiple joints, with or without having had aggravating trauma, is a strong argument that some predisposing factor or disease must play a role. A contrasting argument, however, is derived from the fact that in many post-mortem examinations of patients who have died in the 6th, 7th, 8th, and even the 9th decade of life, no changes in the spinal joints are shown. This would exclude the presumption that the changes are a natural part of the aging process or due to ordinary wear and tear. The fact is that in most cases the cause of cervical spondylosis is not known. Yet most patients relate their symptoms, particularly the pain and paresthesias, to trauma. The latter is an important argument in support of the premise that trauma does aggravate the disorder, or at least initiate the symptoms, but the evidence derived thereby is subjective evidence and can only be as valid as is the witness who gives it.

Physicians as a rule accept the statement of patients as true. If it is necessary to challenge the veracity of a patient's statement in order to establish liability, that should be done by detectives rather than by physicians. Whether or not a disability resulting from aggravation of a pre-existing disease warrants recovery for personal injury is a legal question and not a medical one, because the answer should not alter the course of treatment.

In recent years paralysis or paresis of the legs as the result of cervical spondylosis is being verified with increasing frequency. Moreover, this is a disorder that is readily reversible surgically if dealt with early. It is now known that the spinal cord is compressed at times by the growing spurs which encroach upon the spinal canal. In certain patients the spinal canal is developmentally small; in others quite large. Spurs in a small canal would obviously compromise the small canal quickly.

My own experience includes more than 60 cases of this sort. King has recently reported 52 cases, all dealt with surgically. In my cases as well as those reported by King, patients did not relate the onset of their paralysis to injury. This is in contrast to the subjective complaint of pain and paresthesia for approximately 85% of those considered trauma by causative agent.

3.
Gotten reviewed the experience of 200 patients who had suffered with symptoms which had developed after a so-called whiplash injury. His purpose was to determine the influence settlement of the claim for personal injury had on the course of the disease. He noted that 88% were well within three months thereafter. This has been an important piece of work for it does verify the fact that anxiety related to litigation often plays an important contributing role in the production of symptoms. However, he did not account for the 12% who did not recover. His observations do not negate the case records of many patients, including my own, who became physical and emotional derelicts by trauma in which no economic factor was involved who have subsequently been restored to health immediately by correction of a disordered joint, the identity of which was long obscure.

There is good evidence to show that many of the special test which are ordinarily used in the study of cervical spondylosis are not totally reliable. The myelogram, for instance, will show abnormal filling defects at times at levels from which no symptoms emanate, and conversely, will fail to show defects at times even though pathology of the disc is present.

4.
Recently Holt, in an excellent study, has shown that the discogram, for which so much has been claimed, is far from a conclusive test. Using symptomless prisoners as volunteers, he has shown that many claims for this procedure as a diagnostic aid are not reliable. My own clinical experience would confirm Holt's observations, but I would not agree that the discogram is therefore necessarily useless.

Accurate diagnosis cannot be made on any isolated finding in this disorder, but must depend on a correlation of the history with minor changes as elaborated by multiple methods of testing. If an injury has been violent and severe, sufficient to have produced a fracture dislocation of the neck or to extrude suddenly and abruptly a nubbin of disc material, the clinical picture is usually clearcut. Brain injury resulting from acceleration and deceleration of the head which may accompany tortion of the neck, usually manifests itself differently than disorders of the neck. The principal and most difficult problem of differential diagnosis occurs with the patient who complains of disabling pain after trauma, with or without factors of litigation present, but who shows meagre or no demonstrable abnormal findings to confirm the diagnosis.

There are some differences, however, in the clinical manifestations of patients whose symptoms are psychogenic as compared to those whose symptoms are solely from underlying organic pathology which would make one suspicious. For example, most of the patients whose symptoms are psychogenic will tend to seek legal aid before seeking medical aid. Gestures with the head and neck are used for emphasis while speaking. This is not true as a rule with a patient who has torn tissues in the neck. The patient whose symptoms emanate from anxiety tends to place emphasis on the guilt of the defendant in giving the medical history. His medical visits are often related to events on the legal calendar such as a court hearing, an insurance form, or perhaps a medical examination at the request of the defendant.

Despite the skill and astuteness of the most experienced physician, it is difficult at times to render a sound and just decision in such cases. A method which I have found useful, and which I suggest to you, has been to advise the patient and the patient's counsel that I have been unable to demonstrate objective evidence to confirm the diagnosis of organic disease and that the symptoms were thought to be functional in origin and aggravated by the tension of litigation, reminding them that the conditioned reflex permits an illness to be initiated by disruption of tissue, but to continue on a functional basis long after the disruption of tissue has been repaired. One can come to such conclusions in any particular case only after prolonged observation and often after consultation. When this conclusion has been reached, the recommendation would be made that in the hope of removing the tension of litigation, that the litigation be concluded by settlement, if possible. This suggestion has usually been countered by the contention that if the examiner's judgment were in error, subsequent medical expenses would have to be paid by the patient. In response to this, the patient and the patient's counsel have been advised that if indeed the examiner's judgment proved in error and the patient's symptoms persisted requiring surgical correction at a later date, that the examiner, if the patient wished, would render the service without cost. This has usually been sufficient to convince the patient of the sincereity of the examiner's motives, and to persuade them to negotiate.

During the past three years, more than 100 cases have been dealt with in this manner and most have been settled under these terms without hostility toward the physician. Three of the patients of this group have indeed remained disabled and subsequently have developed evidence that would permit the diagnosis of an injured spinal joint and have required surgical treatment. Each of them has returned for the operation and the surgeon has fulfilled his commitment. Each of them is now well, and two were sufficiently appreciative that they have paid the surgeon anyway.

It is our plan, therefore, when presented with patients whose symptoms are disabling but whose abjective findings are scant, to advise them at the outset that they do not have a morbid or dangerous illness, that the overwhelming majority of people with similar injuries have recovered spontaneously within a few weeks or months and without surgical treatment. They are advised accordingly to accept conservative treatment for several weeks or months. If the symptoms continue to subside, of course no problem exists. If, however, the patient continues to suffer or to be disabled, repeated examinations - physical, neurological, roentgenological, electromyographical, etc. are carried out. If such a patient's history convinces the examiner that he was indeed a stable person prior to the accident, but that his life has been modified from that of a productive happy person prior to the accident to one who is invalided thereafter, all examinations are repeated, and if any evidence, even though scant, identifies one joint as the offending agent, surgical correction is undertaken.

Time will not permit presentation of these case records, and it is recognized that some may suggest that the benefit which has come to this unhappy group was the result of the influence of the treating physician's personality on the patient. I do not think so. On the other hand, I do not know the mechanisms which lead to such

disabling pain and parasthesias in so many cases. It is indeed necessary that we restudy in detail our concept of pain mechanisms and disorders of motor function.

Noordenbos[5] has recently advanced an hypothesis which held that there are at least two pain systems: one, a multi-synaptic, slow acting system, and two, a uni-synaptic system of fast transmission which travels through the spinothalamic tract. He also has demonstrated that all nerve fibres are capable of elaborating and transmitting pain.

The contraction of skeletal muscles also is a far more complex mechanism than that of a simple contraction in response to electrical stimulus. New knowledge which has been derived from studies of the basal ganglia and the muscle spindle leaves no doubt that the system is at least dual and probably more multiple than this. One system initiates contraction; one maintains tone; another influences coordination, and this complex system is influenced by various inputs and feedbacks.

One could go on with the presentation of clinical and experimental data but I think this is unnecessary. I hope the point has been made that some patients who have minimal organic disease suffer disabling symptoms that are almost identical with those which emanate from and are maintained by stimuli that are solely psychogenic It is my judgment that it is not only wrong, but impossible, to treat effectively either group of patients as long as the secondary anxiety state is being augmented and aggravated by the adverse forces of the adversary system of adjudication.

The adverse effects of the adversary system on the adjudication of claims are multiple, and I am convinced, as was Aiken[6], that in many instances the patient/clients leave the courtroom with a sum of money which they spend and a disability which they keep. The psychic trauma of having one's integrity challenged, mixed with the natural hostility which an individual holds toward one who has injured him, the fear of progressive diability, the frustration of being without an automobile for a time, the fear of an examination by a physician thought to be hostile, the fear of cross-examination - all these things compound a patient's illness and render obscure in many instances the data upon which assessment and treatment of any organic disease which may be present must be made - a disorder that may require corrective treatment before the secondary anxiety state can be dealt with.

I had hoped for a time that an impartial medical tribunal system might obviate the harm so often inflicted on patients by conflicting medical testimony which usually evolves when two physicians dealing with the same patient do not consult with each other. In Ohio, we have tried the system of an impartial medical tribunal for certain industrial claims, and I regret to state that it is not satisfactory. While any question of conflict of interest on the part of the doctor has been removed by this system, practical experience has shown that three physicians conducting a single examination of the record and of the patient can rarely elicit all the data upon which sound judgment must be based. More important, these judgments do not encompass treatment, and the thought of assessing disability without considering the application of treatment and rehabilitation is shocking to me.

For several years I have urged advocates to permit me to share with the physician examining for the defense those data and opinions which have evolved from my experience as the treating physician, and conversely, when my role was that of the examining physician, to permit me to share with the treating physician all data that my examination elicited. When this has been permitted, with the patient's full knowledge and consent, it has usually been possible for us to agree upon the presence or absence of disease, the probable cause, the degree of disability both temporary and permanent, and the course of treatment most likely to restore the patient to health. When this has been achieved, it has remained for the courts to determine only the liability and the dollar value of the disability. When this has been permitted and the interchange carried out with candor and certitude, the anxiety of the patients, their hostility toward the medical profession, their distrust of the carriers and the court, have been lessened, and it has usually been possible to proceed with effective treatment even while adjudication was under way. Most of these cases have been settled by conference rather than by trial, and jurists tell me that the work of the courts has been expedited. The basic principles of medical ethics require that we consult with our colleagues about patients. Ethics of the legal profession require that the lawyer as an officer of the court help avoid error, seek disclosure of the truth and a just verdict, and advocate his client's cause only within this framework.

I call upon the legal and medical professions to adopt this consultative method in the adjudication of claims and I am confident that the majority of the legal profession and the courts will concur, at least in principle.

One would be naive, I suppose, to presume that this proposal would be immediately and universally accepted. Indeed, it may not be achieved in our lifetime, but to paraphrase the late President Kennedy, I say, "Let us begin!," and I know of no better place to sound the call.

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