Disability of the Back in Industrial Workers

Are Work Restrictions Justified on Roentgen Abnormalities Alone?

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• In a company of over 75,000 employees, an analysis was made of cases of compensable disability of the back in a period of five years to determine the value, if any, of routine pre-employment x-ray examination of the spine.

Of particular interest was the relationship between the finding of spondylolisthesis and Schmorl's node to the awards. It is often difficult to offer conclusive evidence of any kind. Sometimes there is complaint of impairment of back function with no objective symptoms, sometimes no complaint at all although abnormalities are readily demonstrable.

THE QUESTION "Are work restrictions justified on the basis of x-ray films of the spine alone" is prompted by a serious problem which hangs ominously over industry—compensable backaches.

Pre-employment physical examinations as they bear on this problem, if done superficially, are worthless. Yet there are practical limits to thoroughness, for if a physical examination were to include every diagnostic procedure known and require several weeks to complete, it might be a medical ideal but it would be a financial monstrosity to the employer and a gruesome experience to the person who is only asking for a job.

How far, then, should an examination go to serve the practical purpose of knowing what an applicant can do without hurting himself, his co-workers or the employing company? Specifically, how much of an examination is required to prevent back disabilities?

To find the solution a number of medical directors of various corporations in the Los Angeles area personally discussed the merits of routine x-ray films of the spine. Some believed it would be necessary to study films of the entire spine of every applicant. Others thought that films of the lumbosacral area were sufficient unless something in the history or physical examination made additional studies advisable. I belonged to the latter school of thought and instituted that procedure.

Accordingly, when lower spine deformities were found the applicant was either rejected or certain restrictions were imposed. However, a number of men who were barred from factory work complained they previously had worked for the company and never had had back trouble and were doing work at home which far exceeded the physical demands of the jobs. Examination of the records of their previous employment by the company revealed most of these complaints were justified. These observations led to a review of the pertinent literature. An article by Fullenlove and Williams[1] listed the roentgen findings in 200 industrial workers with symptoms referrable to the back and 200 without such symptoms. The average age of the group was 40 years and the average length of service was 18 years.

The list consisted of congenital defects such as spondylolisthesis, transitional vertebrae, rudimentary discs, spina bifida occulta and sacrilization of the last lumbar vertebra. Traumatic conditions included compression of the vertebral body and fracture of the transverse process. The list also included degenerative, arthritic, neoplastic and structural conditions.

Of particular interest was the incidence of spondylolisthesis. There is a universal belief that when this condition is discovered in a routine spine x-ray of an applicant he should be rejected for factory employment because it indicates an unstable back. There were three persons with this condition among the 200 who had symptoms; there were five among those who did not. Even in the three cases of spondylolisthesis in persons with symptoms, there was no conclusive evidence that this abnormality was the one solely responsible for the symptoms.

Since "congenital defects and structural changes are about equal in number in the two groups," the authors said, "it seems doubtful that their presence *per se* is of clinical significance," and "we do not consider congenital defects or anatomical variations independently a cause of backache."

The company of which I am medical director has about 75,000 employees in various plants throughout the country. I sent the previously mentioned list of spinal abormalties included in the study by Fullenlove and Williams to the medical supervisor of each plant. Each was asked to indicate opposite the conditions listed the amount of the awards granted

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by the Industrial Accident Commissions during the previous five years.

I expected a cut-and-dried record which would quickly indicate which spinal deformities were most likely to be a financial burden to the company, thinking that on that basis the physicians would impose appropriate restrictions whenever those spinal conditions were discovered.

That is not the way it worked out at all. Take, for example, the data on cases of Schmorl's node. This is a condition recognized by concavities on opposing surfaces of vertebral bodies. Presumably this indicates a gradual penetration of disc tissue into the cancellous part of the vertebral bodies. It is a chronic degenerative change rarely due to or aggravated by trauma.

In one of the California plants (Santa Monica) during the past five years there were 45 cases in which employees received compensation awards because of disability referrable to the back. In only one of these cases was a Schmorl's node noted. In a midwestern plant (Tulsa) where there were 90 cases of compensable disability of the back during the same period, Schmorl's nodes were present in 22 cases—and were the only roentgenographic abnormality noted in those cases.

Statistics, it appeared, were not statistics at all. By simply limiting my observations to one plant or the other I could say the incidence of Schmorl's node in award cases is only 2 per cent or, with equal conviction, that the incidence is 27 per cent.

Fullenlove and Williams said that Schmorl's nodes were noted in 13 per cent of the previously mentioned 200 patients who had no symptoms referrable to the back, whereas the incidence in patients who did have symptoms was only 5.5 per cent. Again, there is nothing in the report to indicate either that the Schmorl's node was the sole x-ray finding or that it had anything to do with the actual pain in the back.

Some time ago, after an employee with spondylolisthesis had received a compensation award, one of the physicians for the company for which I work expressed belief that anyone with this condition should not be employed in the factory. Yet, of the previously mentioned 45 patients from the Santa Monica plant whose cases were brought before the Industrial Accident Commission, only three had spondylolisthesis and two of them did not receive awards.

Apparently, positive findings in films of the spine, unless due to trauma with resultant fractures, compressions or disc involvement, do not necessarily mean that a person should be restricted in his work. Of course, if there is a history of back trouble that is a different story. However, there are countless employees who have positive spine findings who have been doing hard physical work for years with no complaints referrable to the back. Even so, many industrial physicians are not impressed. They say, "Give these employees time. They will develop symptoms. It is better to put restrictions on them now."

This does sound logical except for one other fact. Awards have been given to persons who, according to the radiologist's reports, had absolutely normal spines. If we apply the principle of putting restrictions on persons who have conditions of the spine similar to those who have received awards, then everyone who has a normal spine would be restricted, too, or perhaps even refused employment.

The suggestion has been made that if films are taken of every applicant's spine, then the employer could prove the previous existence of a condition in the event of filing before the Industrial Accident Commission. But suppose we do find some abnormality of the spine, that the applicant is accepted anyway and that later he complains of a chronic backache. More films are taken and we say to the commission, "See, this man's spine is no different today than it was before we hired him."

What, exactly, does this prove? That the man does not have a backache? That it did not occur on the job? The Industrial Accident Commission is well aware that other conditions can cause a backache. The trouble is that too many physicians believe that the x-ray films of the back are the deciding factor.

This is very much like the great satisfaction that a physician derives when he is able to show a patient with a chronic backache some x-ray films of the spine and say: "Look at these films: See those spurs sticking out of the vertebrae? You have arthritis. No wonder you have a backache." The physician may be correct, but what about all the other persons with x-ray films of the spine showing exactly the same arthritic changes—spurs and all—who do not complain and never have complained of backache? Isn't it possible that these so-called arthritic patients may be suffering from any one of dozens of other reasons which can cause a backache, such as chronic prostatitis?

Members of the Industrial Accident Commission know that there may be other causes but is sometimes forced to make a decision on an x-ray finding simply because they have not been supplied with the information necessary to prove there is another reason for the pain in the back.

To think that the commission bases its awards chiefly on x-ray films of the spine indicates unfamiliarity with the method used to evaluate disabilities of the back.

Briefly, the elements that determine such disability are pain, weakness and impaired endurance—none of them demonstrable on an x-ray film. If the

sum of these elements in a given case seems to cause slight disability, the rating is from 0 to 35 per cent; if moderate, the rating will be between 40 and 65 per cent; if severe, from 70 to 100 per cent.

When someone files a claim of disability with the commission, the employer is automatically considered responsible, at first. It is up to the employer to present evidence, if there is any, to disprove that disability exists or exists to the extent claimed.

To present an x-ray film of a spine and feel confident that it will prove or disprove any of the three elements is wishful thinking. The film has the same value as any one piece in a jigsaw puzzle. It is possible for the Industrial Accident Commission to have a good idea of what the full picture is like if one or two pieces are missing, such as a pre-employment routine film of the spine.

What the commission wants, and too often fails to get, are definite answers to questions such as these:

Exactly what is the employee able to do on the job immediately before the time the rating is to be established?

If other employees aid the plaintiff in his work, is it because it is the usual procedure for the job or because of the man's disability?

How much lifting, pushing or pulling can the person do repeatedly? Is it from one level to another?

How much and what types of drugs are necessary to give relief and how often must the drugs be taken?

What are the employee's activities off the job? In what sports does he participate and to what extent and frequency?

What was the extent of the physical examination given the employee to determine his disability? Did it, for example, include a proctoscopic examination?

Some years ago the head of the Orthopedic Department at the Mayo Clinic, Dr. Henry Meyerding, told me that in an amazingly large proportion of cases complaints of backache were due to foot trouble. Yet, through the years, I have seen physicians from time to time examining a patient's back without asking him to remove his shoes.

How many physicians take the time and trouble to measure the size of the calves and thighs to see if atrophy has occurred? When testimony is presented at a hearing by the plaintiff that atrophy exists, the records of the company physician should confirm or deny it. The company physician should put on the record such observations as whether or not the back pain is aggravated by pressure on the jugular vein. He should know if there is a neoplasm or infection in the body which may be a contributing cause, if not the sole reason, for the complaint.

It is the company physician's job to make an accurate diagnosis of the patient's complaint without being concerned as to who will benefit by the diagnosis, the employee or the company. In my 30 years' experience in industrial medicine I have never known a company unwilling to fully compensate a man for an injury resulting from his job. But the company has a right to be reasonably certain that the disability actually exists and to the extent alleged and that the company is responsible for that disability. The x-ray findings alone cannot establish such a certainty.

For illumination, let us assume the opposite viewpoint and concede that x-ray findings by themselves are sufficient reason for placing restrictions, or appraising disabilities, and that x-ray films should be taken routinely of everyone applying for a factory job. We then come face to face with another problem—the effects of radiation.

It is nothing unusual today to have applicants for jobs refuse to have a single chest film taken. It isn't because they have conditions which they wish to hide, but because they fear what they believe might be the effects of the radiation. Whether or not such fear is justified is not the point. If the applicant is squeamish about x-rays of the chest, he is certainly going to hesitate to permit x-rays of the lower spinal region which are taken merely for the employer's record.

We now come to the final point—expense.

Let us consider not the big corporations with well-established medical departments and full x-ray facilities but the small industries which have a first-aid dispensary and a part-time physician who does the pre-employment physical examinations. Would it pay to have x-ray equipment installed for the chief purpose of making routine pre-employment x-ray films of the spine? If it would pay, then there would be the added advantage of having such equipment to take routine chest films and make examinations of parts of the body which may be fractured or contain foreign bodies.

The idea is most commendable, but it must be realized there is no such thing as having an x-ray machine and expecting it somehow to produce the films by itself. The average physician is not sufficiently trained to take films of excellent diagnostic quality. If a technician is hired, usually he needs an assistant to develop the films while he positions the next applicant, makes the necessary calculations for exposure, and so on. Then, of course, there are going to be x-ray records that have to be typed and filed, which means that sooner or later a typist and clerk will be needed.

The company that is willing to invest in an x-ray machine should be willing to invest in a department that is able to take care of that machine and all the ramifications that go along with it. Furthermore, the physician who does the physical examinations

should not be expected to see and interpret everything in the films with a radiologist's accuracy. Every film should be taken by a qualified technician and read by a radiologist.

The expense of an x-ray department should be weighed against the expense likely to result from Industrial Accident Commission awards resulting because such pre-employment films are not taken as a routine. It may be less expensive and a far more satisfactory arrangement for the small company to send applicants to the office of a radiologist.

This brings us right back to the question: "Is it worth the time and money to do pre-employment routine spine x-rays?" I do not believe so. However, as I stated earlier, statistics can be supplied to prove either side of a question.

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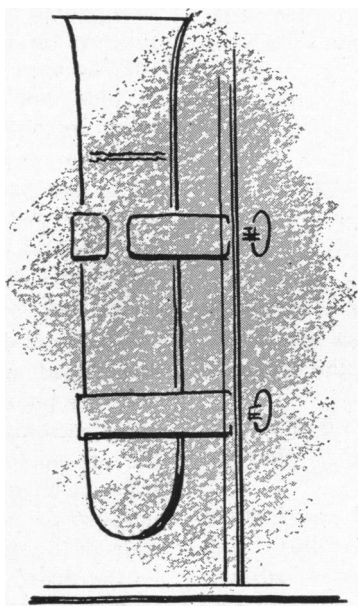
REFERENCES

1. Fullenlove, T. M., and Williams, A. J.: Comparative roentgen findings in symptomatic and asymptomatic backs, Radiology, 68:572-574, April 1957.

2. Robbins, L. L.: Radiation hazards (special article), radiation protection in diagnostic procedures, N.E.J.M., Vol. 257, No. 19, Nov. 7, 1957.