

HERNIA AS AN INDUSTRIAL ACCIDENT

By

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Hernia is defined as a protrusion of a viscus or organ from its normal situation within a cavity through the walls of this cavity. For consideration of hernia as an industrial accident, there are certain postulates that must be satisfied by the claimant before his hernia can be considered compensable. The claimant has to prove that such a hernia occurred because of and during his work, and forthwith he has to declare such an accident to the police and a note should be recorded. It must be proved that there was an injury resulting in hernia which appeared suddenly, did not exist prior to the accident but followed, it, was of a recent origin and accompanied by pain.

Some men with a hernia are completely disabled from doing heavy manual work, while others are able to carry on with an increasing size of the hernia. Meck (1919) stated that a hernia reduces a man's general efficiency at least 25 per cent, but he did not specify the size and extent of the hernia, the type of man, his work, his age or his general condition. In the majority of cases, a medical operation is the remedy that will effect a cure and the return of the claimant to his job. Recurrence are not common, and in Colay's series (1918), they were less than 5 per cent. If operation is contraindicated, the workman is entitled to compensation. Disabilities of hernia in the U.A.R. are valued as follows (Sherif 1959) :

Inguinal hernia	10—20%
Femoral hernia	10—30%
Double inguinal hernia	20—30%
Umbilical hernia	10—20%

Foreign schedules give the following values for hernia (Kessler 1941) :

French jurisprudence	10 to 31 per cent
German jurisprudence	10 to 50 per cent
Swedish legislation	15 per cent

Italian legislation	10 per cent
Swiss laws	15 per cent
Broudel	20 to 30 per cent
Sachet	5 to 50 per cent
Guide Barème	10 to 20 per cent
Barème belge	
unilateral inguinal	5 to 20 cent
bilateral inguinal	10 to 30 per cent

In the case of strangulation, with the great necessity of surgical interference, Imbert (1939) considers the refusal of a man to be operated upon as next to suicide and suggests that no compensation be allowed to him. In the U.S.A. most of the court decisions are favourable to the injured person, and death arising from a refusal to be operated upon has been compensated in full as death from accident. According to the general rule in the U.A.R. legislation, the labourer is only compensated for the hernia as he knows that if he is not operated on, death usually will follow.

In case of a recurrent hernia, it should be either operated upon again at a favourable opportunity or, according to the U.A.R. law, compensated as a hernia that is not operated upon.

It is the rule that before the labourer joins his work, he is medically examined and one of the requirements for appointment is that there should be no existing hernia. The problem usually arises when a hernia appears during work, and it has to be decided whether it is a disease unrelated to the work or an industrial accident i.e. due directly or indirectly to industrial hazards. It is the purpose of this study to analyse the different factors underlying hernia and state the medical and legal points of view.

Material :

Fifty cases were collected and completely studied, all of them were claimants of compensation for their hernia as an industrial accident; and in the author's view were compensable. The data in their files were fully studied and they were grouped according to age incidence underlying factors; and analysed according to the clinical findings. All the cases were male Egyptian subjects.

Results :

1. *Age incidence :*

Grouping of the fifty cases studied according to their age showed :

21 to 30 years old	4 per cent
31 to 40 years old	56 per cent
41 to 50 years old	16 per cent
51 to 60 years old	12 per cent
61 to 79 years old	12 per cent

The official records of the Alexandria University Hospitals show rather a different age incidence; the hernia in these cases was accepted as a disease :

0 to 10 years old	7.2 per cent
11 to 20 years old	14.0 per cent
21 to 30 years old	21.2 per cent
31 to 40 years old	26.4 per cent
41 to 50 years old	17.6 per cent
51 to 60 years old	12.4 per cent
61 to 70 years old	1.2 per cent

If the cases falling in the first and second decade of life are not counted in the above mentioned hernia (hernia as a disease), the age incidence will be as follows :

31 to 30 years old	26.9 per cent
31 to 40 years old	33.5 per cent
41 to 50 years old	22.7 per cent
51 to 60 years old	15.4 per cent
61 to 70 years old	1.5 per cent

It is quite obvious that there is a big difference in the age incidence between the occurrence of hernia as a disease and the hernia in the cases studied which are considered by the author an industrial injury. Although the maximum age incidence in the two categories lies in the fourth decade of life yet the percentage for this age group in the cases studied (56) almost is double that of hernia as a disease (33.5). Another remarkable point is that in the third decade of life the incidence of the hernia as a disease is about seven times that in the series.

Underlying factors :

The claimants, in the studied series, attributed their hernia to various factors which could be classified as follows :

- a) carrying a heavy weight : 54 per cent
- b) pushing a heavy weight : 20 per cent
- c) pulling a heavy weight : 6 per cent
- d) a heavy weight falling on the worker : 6 per cent.
- e) falling from a height : 4 per cent
- f) no certain cause mentioned : 10 per cent.

In cases of carrying, pushing or pulling a heavy weight the immediate cause was a sudden effort or severe strain. Hitting the abdomen through falling from a height or a heavy weight falling on the abdominal wall were cases suffering a direct trauma. Cases which could not give a certain cause i.e. those where hernia appeared during the routine heavy exerting work and where the hernia was associated with the element of surprise, fell in the later decades of life.

5. *Clinical findings in the studied cases :*

- a) General condition : In the fifty cases studied, general medical examination showed that all the systems in the body were normal. The Prostate was not enlarged in any of them, and urine was free from sugar and albumen.

b) *Site of the hernia*

right inguinal hernia	54 per cent
left inguinal hernia	30 per cent
double inguinal hernia	10 per cent
ventral hernia	6 per cent

c) *Type of hernia*

although the type of hernia is not a criterion of traumatic origin, but for the purpose of classification it was noted that 40 per cent of the studied cases were direct inguinal hernias, 54 per cent were indirect inguinal hernias and 6 per cent were ventral hernias. The phenomenon of patency of the external inguinal ring was not found to be a definite criterion as a tendency to the acquisition of hernia. Although

the reducibility of the bubonocule encountered was not easy and showed resistance, yet typing the cases into reducible hernia or otherwise was not considered of importance in the differentiation if the hernia is compensable or not.

d) *Size of the hernia :*

Since they were of recent origin, all the cases were of small size, 80% less than the size of a lemon, and 20 per cent were of a slightly bigger size.

e) *Signs accompanying the appearance of the hernia :*

i. severe sudden pain in the groins that made the patient stop his work and brought him to a state of anguish 40 per cent.

ii. slight sudden pain, patient could carry on with his work but felt fatigued : 30 per cent.

iii. feeling of something bursting in the groins : 10 per cent.

iv. feeling pain in the groins accompanied by pain in the neck : 10 per cent.

v. not feeling much pain in the groins but the sensation of a belt tightening him : 10 per cent.

It can be seen that pain was a constant observation accompanying compensable hernia. This pain, however, differs in its intensity and site.

DISCUSSION

The consideration of hernia as an industrial injury has been a matter of dispute among surgeons, employers physicians and in the legislation of different countries. In the U.S.A. the different State Laws sometimes contradict each other to a great extent. The New Jersey law, for example, is specifically designed to pay for only a small percentage of hernias. A more liberal attitude is that expressed by the Utah Commission when it states that the issue of predisposition to hernia should be regarded as unimportant, and any hernia resulting from strain, wrench or other industrial injury, whether complete or incomplete, is compensable.

The difference in the age incidence between the hernia considered as a disease and the hernia in the studied cases is remarkable. Also, the underlying factors causing hernia are of utmost importance. Carrying, pushing or pulling a heavy weight is considered as an unusual effort beyond that which is required for routine work or which is exercised by the injured in an unfavourable position to assume the effort. This is called by Imbert (1939), a hernia de force' and its immediate cause is a sudden effort or severe strain. The hernia immediately follows the accident and is accompanied by pain which compels the labourer to cease work. Examination of such cases in the studied series, showed that this type of hernia was found to be tender, painful, hard and difficult to reduce, unilateral, small and the external inguinal ring was tight.

Falling from a height on the abdomen or falling of a heavy weight on the abdominal wall are considered means of a direct injury.

Riberio (1925) observed that the proportion of a hernia resulted from a direct injury is less than 1%, Kessler (1941) found that they occurred in about 0.3% of his series of cases. These figures were low because these authors considered only the crushing type of injury as for example the passage of a wheel over the pelvis and lower abdomen, they stated that the hernia was associated with other severe injuries such as fractured pelvis. There are other mechanisms of producing a hernia from a direct trauma. For example, two men were carrying a heavy rail of iron between them, one suddenly let his end go and the other tried to hold it by raising his thigh for support and the bar hit him directly on the groin. Another example was of these cases who fell and hit their abdominal wall. The effect of the trauma is usually transmitted to the weakest point which may be at some distance from the point of injury with the result of a hernia. The hernia may be a direct or an indirect inguinal hernia. For the occurrence of the indirect inguinal hernia, a congenital predisposition is also an important factor, for unless there is a preformed sac in the inguinal canal no amount of trauma will produce it. On the other hand, unless such a severe trauma occurred no hernia would result.

Cases which as was mentioned, could not give a certain cause and where hernia appeared during the routine heavy work and was associated with the element of surprise, were usually in the later decades of life. The shutter action of the abdominal inguinal ring and the inguinal canal is a fact which largely explains why a physically active man does not develop an indirect inguinal hernia during his active years but may

suddenly develop a hernia in later decades of life. One may reasonably assume that a congenital sac was always there, but the abdominal inguinal ring was effectively closed by muscular effort until the patient reached the age of poorer muscle tone and suddenly engaged in severe muscular effort. So one can state that without such a severe muscular effort, i.e. an industrial effort, hernia will not appear.

Many classifications have been suggested by different authors. Imbert(1939) has proposed an arbitrary classification, based both on the history and the clinical findings immediately after the injury. He classified hernias as hernia "de force" and hernia "de faiblesse". He characterised the hernia "de force" as a hernia produced by unusual effort in an unfavourable position to assume the effort. It is accompanied by severe pain and sensation of anguish. The hernia is small, tender, unilateral with the external ring tight. The characteristics of a hernia 'de faiblesse' are diametrically opposite to those of a hernia 'de force', with a weak or defective abdominal wall.

Kessler (1941) has based his classification, according to the nature of the causative factors of the traumatic hernia, into seven categories:

- Severe local direct force.
- Severe general direct force and indirect force.
- Severe indirect force
- Severe indirect force, steady but not sudden.
- Ordinary strain, hernia not pre-existing.
- Ordinary strain, hernia probably pre-existing.
- Aggravation of pre existing hernia.

Surgeons classify hernia according to its site. The inguinal hernia is classified too into direct and indirect inguinal hernia. The direct inguinal hernia is one that passes through the postinguinal wall medial to the inferior epigastric vessels in the area bounded by Hesschbach's triangle. The indirect hernia is the hernia that passes through the inguinal canal and may descend into the scrotum.

From the medico legal point of view, hernia is either congenital or acquired, in which a cause and effect sequence is usually the determining factor. The causes may be grouped also under two headings : predisposing and existing. Predisposing medico-legal cases could be listed, except those of increased intra-abdominal pressure as : congenital hernia, congenital phemosis, congenital operatures, unde-

scended or late descent of testicle, inherited weakness of abdominal wall and patent ring, postoperative scar, relaxation of abdominal parctes, and obesity, the medico-legal exciting causes are : acute strain, direct trauma and chronic strain.

There is a general wide conception among surgeons and factory doctors that hernia is a disease which develops gradually, being uncommonly if not rarely the result of an accident. They hold the opinion that the real traumatic hernia is resulting from the application of force to the abdominal wall either puncturing or tearing the wall.

The data on the age incidence in the cases studied and believed by the author to be of industrial hazards and those operated upon in the Alexandria University Hositals indicate two well contrasted entities surgical or industrial More than half of the cases considered to be industrial injuries fall in the fourth decade of life, while only about one quarter of the hospital cases, considered to be a disease, fall in that age group.

Again considering the underlying factors, these industrial cases differ from the surgical cases. While in the cases studied there was more or less a certain underlying factor of a sudden heavy strain or a sudden effort or a blow on the body of the claimant, in the surgical cases no his- of such underlying factors can be elicited.

The clincal findings in these two different types of hernia traumatic or a disease, differ a considerable degree too. The general examination in the cases studied revealed no apparent congenital factor or a malformation in their constitution. The maximum incidence concerning the site of the hernia of the cases studied revealed that more than half of the cases were right inguinal hernias. Most people are right handed and most of the strain usually falls on the right side of the body. The type of hernia, although not a criterion, illustrates that the direct inguinal hernia was quite common. The size of the hernia (being in 80% of the cases of a small size) shows its recent origin and not a gradually developing hernia from early life, i.e. the hernia did not exist prior to the alleged accident and is of a recent origin. The pain which accompanied too the appearance of the hernia in the cases studied, was noticed to be sudden. A remarkable point to be mentioned is that this pain was not in every case anguish, only in 40% of the cases. In the belief of the author the feeling of very severe pain and malaise should not be considered an important

character without which the hernia should not be considered an industrial accident. These signs are rather signs of strangulation or of an irreducible hernia but when the hernia is reducible the pain is usually bearable. So one should accept pain in the groins, unrelated to its severity, as a characteristic sign of industrial hernia; if the pain is very severe immediate operation is indicated for fear of strangulation.

Cases in which the claimant felt pain in the neck in addition to pain the groins showed no tender spots in the neck, i.e. a reflex manifestation. In the author's opinion, it may be due to an injury to the diaphragm; an open point for further investigation.

The author believes that a hernia clearly recent in origin, accompanied by pain resulting from a strain, arising out of and in the course of employment and promptly reported to the employer and police is an occupational hazard and is compensable. So the author suggests a classification, according to the nature of the causative factors and other factors discussed before.

1. *Traumatic Hernia* :

It is the hernia that is caused by a true trauma on the abdominal wall, and the force is either :

a) *direct local force* :

The claimant receives a direct local trauma, practically crushing in character that leads to damage of the abdominal wall not necessarily tearing of the wall as by trying to keep a slipping bar, falling from a height hitting the abdomen or from a crushing force.

b) *generalised force* :

A blunt force to the abdominal wall, the effect of which is transmitted to the weakest point and may be some distance from the point of injury. Some surgeons as Loyal Davis (1957) believe that unless there is a performed sac in the inguinal canal, no amount of trauma will produce an indirect inguinal hernia. This type of force may produce, too, a direct inguinal hernia, and again surgeons believe that usually there is an important predisposing cause for its development and that is a weak posterior inguinal wall.

But as this hernia appeared after such a type of force, one should blame the force not the workman because the hernia did not appear

from routine work but after a certain force. The general legislation in the U.A.R. is that the assailant is responsible of the sequences of the injuries caused, despite the constitutional abnormalities of the victim.

2. *Accidental Hernia* :

It is the type of hernia that is caused by extreme muscular effort, and this effort or force could be :

- a) *Sudden and severe* : That is an unusual effort sudden and beyond the routine work or the workman is in an unfavourable position. The claimant received such a force suddenly and beyond his capacity and he had to keep it. The sudden increase of his intra-abdominal pressure will lead usually to a hernia in the weakest point i.e. the inguinal region. It is an aetiological base of a direct inguinal hernia.
- b) *Steady and severe* : The force is usually beyond the capacity of any labourer as carrying, pushing or pulling heavy weights i.e. repeated and steady surges of increased intra-abdominal pressure. The shutter action of the abdominal inguinal ring and the inguinal canal may be in an improper way and it will give a hernia. Usually it occurs-not during the active years but suddenly develops in old age.

3. *Occupational Hernia* :

The force in this type of hernia could be sustained by more physically developed people and with proper strong abdominal muscles. Such labourers are engaged in a type of work beyond their capacity and usually not accustomed to physical effort day after day. It could be attributed for example, to that the posterior inguinal wall, i.e. the transversus abdominis aponeurosis with its investing fascia is not of proper strength and he may develop a direct hernia. Such a hernia will develop during the routine work, and is tender and accompanied with pain. The claimant usually of a young age and physically not well built.

In conclusion, other than a direct trauma to the abdominal wall causing a direct injury to the abdominal wall, the surgeon believes that there is always a weak point in this development of the abdominal wall or the inguinal canal predisposing to a hernia formation. No two persons are completely identical in their constitution and development,

so other different factors should always be taken in consideration. If these factors took place because of and in the course of employment resulting in the development of a hernia has to be considered an industrial injury and compensable. These factors have to be fully investigated in every case by itself, and a thorough clinical examination should not be missed.

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