AN INAUGURAL DISSERTATION
ON
The Physical Signs of Pneumonia

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Physical Signs of Pneumonia.

In the diagnosis of pneumonia the physical signs are of the greatest importance, often serving as a means of enabling us to form a correct diagnosis, when, with the best possible information to be obtained from the rational symptoms the true nature of the affection is obscure.

Very frequently it is difficult to conclude whether the patient has pneumonia or not. The painful chest and distressing cough are wanting, and headache, fever, and hurried respiration (which are common to many affections) are all the phenomena present. The spitting which are so characteristic often fail to furnish the knowledge required, thus may be no matter at all exsanguinated or, if exsanguinated, it may be swallowed as is said to be the case with children, or in consequence
of abundant cutaneous seconction, or hemorrhagic affections, they may fail to present the properties which render the discharge so very characteristic.

During the period of engorgement or the first stage of pneumonia but little evidence of the condition of the lung is to be obtained by percussion. Some writers state that the heavity resonance of the chest corresponding to an engorged portion of lung is much impaired; but according to Shoda this is not the case. He maintains that the percussion sound remains unaltered be the engorgement ever so great prior to respiration. Lacrosse also held this opinion as being true. But, demonstration of its correctness is difficult, as patients do rarely die at this stage of the disease.

However, in most cases there can be no doubt
but that a diminution of resonance on percussion may be correctly attributed to an inundation of solid matter, which may occur in a few hours from the first appearance of local symptoms. The normal resonance progressively diminishes in proportion to the completeness of the solidification, though it is rarely the case that absolute stumps exist; from the fact that though a great number of the air vessels do not contain air yet, the bronchial tubes are never completely filled with morbid products. The air which is contained in the latter is always sufficient to prevent a total want of resonance. This want of absolute density is a point of discrimination between a solidified condition of the lung and the large zones of effusions which attend pleurisy. In pleural effusions
actual glaucoma is much oftener observed. In cases where there is considerable increase in the
density of the parafoveolar arteries structure of
the living, there is to be noted an unusual
resistance on percussion. This resistance
is in proportion on intensity to the extent
of solidifications, and is of course met with
in a marked degree during the second stage
of the disease, constituting excellent
means by which the amount of condensed
vitrine may be estimated. The venous
resonance and normal elasticity of the post
returns with a resolution of the inflammation,
and by careful percussion the
progress made in the removal of the
solid deposit, and final restoration of
the living to a healthy condition may
be correctly noted.

The phenomena which are elicited by
assaults are much more decisive.
The vesicular expansion is either excited or diminished. According to Pomerell the
besides surrounding an inflamed portion
takes on a kind of supplementary activity
giving rise to an unnaturally loud respiration.
Lehane also says that the first effects of inflammation
produce the vesicular role in an exaggerated expansion. Others contend
that the effect of inflammation upon the
adjoining living structure is often to
diminishing the activity causing an
abnormally heavy respiration. Now either of
these positions is correct in some cases.
The increased function of the vesicle
surrounding a diseased part is so increased
as to produce it, whereas, in others, the
engorgement of the adjacent lung
decidedly suppresses the vesicular expansion.
The earliest and most important of the positive signs of pneumonia is the crepitation sound. This phenomenon gives to the ear the common sensation of a fine dry, crackling sound, similar to that produced by the decrination of salt in a pan by heat, or that caused by pressing a thin layer of ligature between the fingers. This sound is produced by the bursting of extremely small bubbles of adherent in the air vesicles and smallest bronchi. These bubbles are observed only on inspiration, are very numerous of uniform size and rather dry. This sign is common to a physical condition belonging to the first local effects of inflammation, and is to be heard when the inflamed surface is sufficiently extensive and near enough to the surface for the sound to be
transmitted. This is the characteristic sound of pneumonia: whenever it is heard inflammation is declared to exist. According to the opinion of Skoda, the crepitant rale is not so frequently present, but others assert that it is present in a majority of cases, as has been demonstrated by various autopsies. The crepitant rale, though the most important sign of pneumonia in the first stage, is not so often and not within cases of children. This rale may come in time during the whole course of the disease, disappearing and appearing again at irregular intervals; it has been looked upon when having returned after disappearing as being indicative of convalescence; but, on the contrary as a general rule
when the role has disappeared after continuing for some time, it is not reproduced except as the sign of a new centre of inflammation. Another important role, and on which may occur at any period of the disease, is the inebriation. This is a bronchial and not a vesicular role, giving the idea of small unequal bubbles wanting the sputum, equality and desprop of true crepitant and not being limited to inspiration. This may be blended with the crepitant role and is distinguished from it by being continuous during both acts of inspiration. The inebriated role is said to appear at a late period of the disease except in cases in which pneumonia and capillary bronchitis are associated.
appearing about the period of resolution, it is supposed to be the returning crepitation of some writers, however, the appearance of this rule is not met with in every case. All the bronchial rales, both inspiratory and expiratory, are to be observed in some well-developed cases of pneumonia, though they are not of invariable occurrence. For as some of these ronchi which are indicative of the coexistence of bronchitis, which is not an invariable complication of the disease, only to a limited extent will seldom be met with and in fact most of them may be considered as transient phenomena occurring only in occasional cases attended by considerable bronchitis. Writers assert that the bronchial rales
are scarcely ever heard until the disease has advanced beyond the second stage, so it may not be looked for until the third stage has appeared, in which the ominous or bubbling notes are some ground to be present. This very seldom occurs or these notes in pneumonia has been conclusively demonstrated by careful examinations.

In 68 examinations by Dr. Frick but 7 of the bilious or the concomitants and 8 of the ominous were observed.

In pneumonia it has been said by some that a friction sound is perceptible in some cases, though this is thought to be very rare. In a majority of the cases of pneumonia important modifications of the respiratory phenomena arise. Among those of greatest importance and most frequent occurrence are to be...
reckoned the bronchial, and bronchic
vesicular respiration. The former of these
modifications is rarely absent in a
dingle case, and may be regarded as an
evidence of solidification, and is also
indicative of the approach of the second
stage and is generally in proportion
to the completion of the solidification,
disappearing as the solid condensation
which produces it is removed.
This form of respiration very often
marks the introduction of the second
stage, yet the period of its occurrence
as very uncertain, coming on early
in some, so early indeed as to replace
the vesicular inscrption and dejected
in others to a late period. Whereas, in
many cases the transit from the vesicular
to the bronchial is so gradual that it
difficult to note. In acute cases of pneumonia the bronchial respiration is said not to be a variable sign, but as a general rule to be observed at each successive examination, from its first appearance to its decline and cessation. However to this rule there are occasional exceptions, as for instance, in cases where it appears after it has entirely ceased, the disappearance being doubtless owing to partial obstruction of the bronchial tubes, which maybe produced by various causes.

These signs vary in intensity, character, in different cases, being sometimes tubular and short, and on others long; in some again having tubular inspiration without any sound of inspiration. In most cases of pneumonia
The disease being limited to the lower lobe of one or other lung, the most natural modifications of the respiratory sound and other physical signs are to be observed at the posterior part of the chest, generally below the spine of the scapula, also at the lateral ports, the front of the chest seldom emitting these sounds. Though occasionally at the superior part in front are to be noted bronchial respiration and the crepitant rattle. In many cases auscultation fails to accord me with anything of importance at the anterior part of the thorax.

In consulting the physical signs of this disease, there are to be observed certain important vocal phenomena. Bronchophony exists when present one of the most indubitable signs which is
met with in a majority of cases, is an
exaggerated resonance of the voice, being
intense and apparently approaching
more than normal the ear of the auscultator.
This increased proximity of the voice, which
has been defined to be that modification
tumed bronchophony is not invariably
attended by exaggerated resonance, though
an unnatural reverberation is generally
present. The approach of the voice to the
cor, and the reverberation where both present
do not always correspond as respects their
relative intensity; sometimes the voice
so seemingly near the ear when the
resonance is but little increased, and
again the resonance may be intense
while the voice is as distant as usual.
Very frequently an increased thrill or
vibration is felt when ear is applied to
The chest. This increased vibration of the walls of the chest may or may not accompany broncopneumonia, and yet is sometimes met with where the other local symptoms are wanting.

Broncopneumonia varies in different cases of pneumonia, being in proportion to the extent of solidification, and is at its maximum of intensity, when the solid deposit is most extensive; but declines and entirely disappears, as the hepatic thymus is relieved. These symptoms are indicative of the second stage, and are of variable duration, sometimes disappearing very abruptly.

Pectoragglutinin is another interesting sign which is occasionally to be observed in this disease, during the stage in which there is solidification.
When words spoken by the patient are transmitted to the ear of the auscultator distinctly, it is said that pectoralization is detected. In some cases whispering pectoralization is present, as for instance when words whispered are transmitted through the solidified lung so as to be audible. According to the opinions of some, the latter form of pectoralization is indicative of the existence of a cavity, whereas high authorities contend that it is often met in solidification.

When whispered words are not transmitted, there is to be heard generally a kind of bongle or puff, which may under certain circumstances be regarded as a sign of importance. When present its indications are the same as those of bronchial respiration and pneumophony.
and go on to corroborate the condition of the lung as indicated there.
There is occasionally to be observed a
fibrinous exudate, known as tapropmy,
which very seldom occurs.
Some writers of great observation and
extensive practice, state that they have
never detected it in a well developed lung.
Of the third stage but little is to be learned
by physical examination. According to
Dr. Wood as long as the pneumatic effusion
remains, the same dulness on
percussion and the same respiratory
sounds remain present that exist during
the second stage. But should the complete
evaporation of the air cells be replaced by the
pneumatic matter of the third stage, there
will generally be present the pneumonia, or most
dole.