

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 sputa which are so characteristic often fail to furnish the knowledge required, there may be no matter at all expectorated, or, if expectorated it may be swallowed, as is said to be the case with children; or in consequence

of abundant catarrhal secretions, 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 healthy resonance of the chest corresponding to an engorged portion of lung is much impaired; but according to Schroeder, this is not the case. He maintains that the percussion sound remains unaltered be the engorgement ever so great, prior to oxidation. Laennec also held this opinion as being true. But, a demonstration of its correctness is difficult, as patients so 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 exudation 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 flatness exists; from the fact that though a great number of the air vesicles 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 dulness is a point of discrimination between a solidified condition of the lung and the large serous effusions which attend pleurisy. In pleural effusions

actual flatness is much often observed. In cases where there is considerable increase in the density of the parenchymatous structure of the lung, there is to be noted an unusual resistance on percussion; this resistance is in proportion in intensity to the extent of solidification, and is of course met with in a marked degree during the second stage of the disease, constituting an excellent means by which the amount of condensed tissue may be estimated. The vesicular resonance and normal elasticity of the part 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 lung to a healthy condition may be correctly noted.

The phenomena which are elicited by

auscultation are much more decisive.

The vesicular murmur is either excited or diminished; According to Foronetti²² the vesicles surrounding an inflamed portion take on a kind of supplementary activity, giving rise to an unnaturally loud respiration; Stokes, also says that the first effects of inflammation previous to producing the crepitant rale, is an exaggerated murmur. Others contend that the effect of inflammation upon the adjoining lung structure is often to diminish the activity causing an abnormally weak respiration. Now either of these positions is correct; in some cases the increased friction of the vesicles surrounding a diseased part is so increased as to produce^{it} whereas, in others the engorgement of the adjacent lung decidedly suppresses the vesicular murmur.

The earliest and most important of the positive signs of pneumonia, is the crepitant rale. This rhoncus gives to the ear the common sensation of a fine dry crackling sound, similar to that produced by the decrepitation of salt in a pan, by heat; or that caused by pressing a thin layer of lung between the fingers. This sound is produced by the bursting of extremely small bubbles of mucus 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 its first stage, is not so often met within cases of children. This rale may continue 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 rale has disappeared after continuing for some time, it is not reproduced except as the sign of new centre of inflammation.

Another important rale, and one which may occur at any period of the disease, is the subcrepitant; This is a bronchial and not a vesicular rale, giving the idea of small unequal bubbles, wanting the fineness, equality and dryness of true crepitant, and not being limited to inspiration.

This may be blended with the crepitant rale and is distinguished from it by being continuous during both acts of respiration. The subcrepitant rale 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 crepitant of some writers; however, the appearance of this rale is not met with in every case.

All the bronchial rales, both stridating and humid are to be observed in some well developed cases of pneumonia, though they are not of invariable occurrence. For as some of these rhonchi 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 an occasional case attended by considerable bronchitis. Writers assert that the bronchial rales

are scarcely ever heard unless the disease has advanced beyond the second stage, so it may not be looked for until the third stage has appeared, in which the mucus or bubbling rales are some found to be present. The very seldom occurrence of these rales in pneumonia has been conclusively demonstrated by careful examinations.

In ~~the~~ examinations by Dr. Flint, but 7 of the sibilant & of the sonorous and 3 of the mucus were observed.

In pneumonia it has been said by some that a friction sound is perceptible in ~~some~~ 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 broncho vesicular respiration. The former of these modifications is scarcely absent in a single 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 completeness of the solidification, disappearing as the solid exudation which produces it is removed.

This form of respiration very often marks the introduction of the second stage, yet the period of its occurrence is very uncertain, coming on early in some; so early indeed as to replace the vesicular murmurs, and deferred in others to a late period. Whereas, in many cases the transit from the vesicular to the bronchial is so gradual that it is

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 may be produced by various causes.

These signs vary in intensity & character in different cases, being sometimes tubular and short, and in others long so; 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 usual 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 parts, 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 rale. In many cases auscultation fails to acquaint us with any thing 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.

Broncophony which, is 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 nearer than usual ^{to} the ear of the assentator.

This increased proximity of the voice, which has been defined to be that modification termed broncophony is not invariably attended by exaggerated resonance, though an unnatural reverberation is generally present. The approach of the voice to the ear, and the reverberation when both present do not always correspond as respects their relative intensity; sometimes the voice is 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 visual. 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 bronchophony; and yet is sometimes met with where the other vocal symptoms are wanting.

Bronchophony 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 hepatised lung is relieved. These symptoms are indicative of the second stage, and are of variable duration, sometimes disappearing very abruptly.

Pectoraloggis 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 pectoriloquy is detected. In some cases whispering pectoriloquy 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 pectoriloquy is eminently 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 sough 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 bronchophony.

and go far to corroborate the conditions
of the lung as indicated there.

There is occasionally to be observed a
tremulous voice, known as *capopony*,
which very seldom occurs.

Some writers of great observations and
extensive practice, state that they have
never detected it in a well developed form.

Of the third stage but little is to be learned
by physical examination. According to
Dr. Wood as long as the purulent effusion
into the parenchyma ^{remains}, the same dullness on
percussion and the same respiratory
sounds ~~are~~ present that exist during
the second stage. But should the condense-
condensation of the air cells be replaced by the
purulent matter of the third stage, there
will generally be present the *crâmes*, or moist
râle.