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D'ESPINE'S AND ALLIED SIGNS IN CHILDHOOD *

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About six years ago, finding that there was considerable difference of opinion as to what constituted D'Espine's sign, I looked up D'Espine's original descriptions of his "sign" and found them to be as follows:

In one article¹ he said that he had called attention briefly to this method of diagnosis in 1889,² and that Professor Brouardel, in a communication made for him at the session of the Academy of Nov. 8, 1904, said:

"The first signs of bronchial adenopathy are furnished exclusively by the auscultation of the voice, and are found almost always in the immediate neighborhood of the vertebral column between the seventh cervical vertebra and the first dorsal vertebra, sometimes in the fossa 'sus-épineuse,' sometimes in the interscapular space. They consist in a quality (timbre) added to the voice, which may be called whispering (chuchotement) in the first stage and bronchophony in a more advanced stage."

He then goes on to say that:

"It is most important to distinguish the exaggerated normal voice sound from the bronchial voice sound."

He says that:

"The tracheal sound is heard normally through the seventh cervical spine, where it ceases abruptly. In bronchial adenopathy the bronchial sound extends downward into the space between the seventh cervical and the fourth or fifth dorsal spines. This space corresponds to the last portion of the trachea and the bifurcation of the bronchi, which is at the level of the third dorsal vertebra."

He recommends the use of "333," spoken in French, for making the test, and says:

"If auscultation of the loud voice or cry gives no result, the child should be made to speak in a low voice."

A sound is then heard which he designates as "whispering (chuchotement)" "This sound has the same value as bronchophony."

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1. D'Espine: The Early Diagnosis of Tuberculosis of the Bronchial Glands in Children, *Bull. de l'acad. de méd.* 57:167, 1907.

2. Manual of Picot and D'Espine, Ed. 4, 1889.

In a later communication ³ he says that:

"The sign is most obvious when the child is made to speak or count in a low voice. The voice is then accompanied by an added whispering sound localized to one or two vertebrae, or possibly extending to the fourth or fifth. A bronchial quality to the respiration at the same place has the same diagnostic value as the whispered sound. It is necessary to be content with this, if the child is too young to speak, but the bronchial breathing is a sign of enlargement already more considerable and more extensive. It is the same with vertebral percussion."

A number of articles on D'Espine's sign have been published since that time. It is evident that their authors have not read D'Espine's original descriptions of his "sign," have not understood it, are using the term to mean something different from what he meant in his description, or that my translation of his articles is wrong. It was even suggested a year ago that D'Espine had changed his mind as to what he meant by his "sign." In order to be sure that my translation was not incorrect I sent a copy of my paper ⁴ to Dr. Charles Greene Cumston, an American, but also a colleague of D'Espine at the University of Geneva. He writes, "I have carefully gone over your interpretation of Professor D'Espine's sign and find it absolutely correct." I then wrote to D'Espine to find out if he had changed his mind. He answered ⁵ that the original description is "Aussi exacte aujourd' hui." It seems evident, therefore, that most men have not read D'Espine's original articles and are using the term "D'Espine's sign" very loosely.

The sign to which D'Espine originally called attention is, therefore, a whispering sound following the spoken voice and heard over the spinous processes. No such sound is heard normally. He believed this to be the earliest sign of enlargement of the tracheobronchial lymph nodes. He also believed that the bronchial character of the spoken voice did not normally extend below the seventh cervical spine and that extension of the bronchial sound below this point was evidence of an enlargement of the tracheobronchial lymph nodes. He considered that the extension of the bronchial voice below the seventh cervical spine was always a later sign than the addition of the whispering sound to the spoken voice and that it meant a more advanced process. He paid little attention to the character of the whispered voice (meaning by this a whisper, not the whispering sound heard after the spoken voice) and believed that extension of the bronchial respiratory sound and of dulness on percussion below the seventh cervical spine were still later manifestations and that they signified much more marked changes. Incidentally, he warns against mistaking an unusually loud

3. D'Espine: *Brit. M. J.* **2**:1136, 1910.

4. Morse, J. L.: *Am. J. Dis. Child.* **11**:276 (April) 1916.

5. Aug. 13, 1921.

or deep voice for bronchophony, and states that sometimes it is impossible to determine anything from the voice itself, because of its peculiar character or the thinness of the chest wall.

In view of the great differences of opinion as to terminology, it seemed worth while to examine a series of children to determine, if possible, whether the addition of a whispering sound to the spoken voice is a normal or usual condition or not, whether this whispering sound is always added to the spoken voice before any other changes occur in the voice or respiration and where the change from the bronchial to the vesicular character of the spoken voice, whispered voice and respiration normally occurs. It also seemed worth while to try to determine whether the change from bronchial to vesicular occurred first in the spoken or the whispered voice, whether the change occurred earlier or later in the character of the respiration than in that of the voice, and the relation of dulness over the spinous processes and between the scapulae to these changes.

One hundred and eighteen patients between the ages of 2 and 14 years were studied. Seventy-five of these were between 4 and 9 years of age. Sixty-eight were boys and fifty were girls. They were consecutive cases, except that a child was occasionally missed on account of hurry or because it would not cooperate. Thirty-three of these children were brought in simply for examination and general advice and no evidences of disease were found in them. Eighteen were classified as delicate children, while thirteen had various disturbances of digestion. Six had nasopharyngitis, four had chronic disease of the tonsils and three had bronchitis. The diagnoses in the others were almost all different, not more than two or three having the same disease. The presence or absence of a whispering sound after the spoken voice was noted in each instance. In determining this point, it is necessary that the child speak sharply and that it does not make a whispering sound after speaking. "One" and "Oh" are the best words to use. The points where the spoken voice, whispered voice, and respiration changed from bronchial to vesicular were also always determined. It is evident that this is possible only when a stethoscope with a small bell is used. The point where dulness on percussion began and the presence or absence of interscapular dulness were also determined. The point of change in the character of the spoken and whispered voice and in the respiration was always definite, but there was not the same certainty about the change in the percussion note, and the findings on this point are, therefore, not quite as reliable.

In eighty-eight cases, or nearly 75 per cent., there was no whispered sound after the spoken voice; in twenty-four cases it was heard through the seventh cervical spine, and in six cases below this point as well.

It seems evident, therefore, that a whispered sound after the spoken voice is not the usual condition and is probably abnormal.

The change from bronchial to vesicular in the spoken voice took place between the seventh cervical and first dorsal spines in ninety cases and above it in nine. There was no bronchial voice anywhere in nine cases, and in four cases the character of the sound was everywhere the same and undeterminable. That is, in only six cases, or 5 per cent., did the bronchial voice extend below the seventh cervical spine.

The change from a bronchial to a vesicular whisper took place between the seventh cervical and first dorsal spines in eighty-seven instances. Three of the younger children refused to whisper. The whisper was not bronchial anywhere in five cases and the character was everywhere the same and undeterminable in one case. That is, the bronchial whisper was heard below the seventh cervical spine in twenty-two cases, or about 19 per cent.

The change from bronchial to vesicular respiration occurred between the seventh cervical and first dorsal spines in ninety-seven instances. It occurred above this point in two, in one the character of the respiration was everywhere the same and undeterminable and in three it was everywhere vesicular. In only fifteen, or less than 13 per cent., did the bronchial respiration extend below the seventh cervical spine.

The spinal dulness stopped at the seventh cervical spine in ninety-five cases and above it in one. In one other case no dulness could be made out in the neck. In twenty-one cases, or 18 per cent., therefore, there was dulness below the seventh cervical spine. Interscapular dulness was not found in any case.

In fifty-four cases there was no whispering sound after the spoken voice, the change from bronchial to vesicular in the spoken and whispered voices and in the respiration occurred at the junction of the seventh cervical and first dorsal spines, there was no dulness below the seventh cervical spine and no interscapular dulness. In eighteen others there was no whispering sound after the voice and the change from the bronchial to the vesicular sound in the spoken or whispered voice or in the dulness occurred above the seventh cervical spine. It seems fair to conclude, therefore, that when there is no whispering sound after the spoken voice, the bronchial voice, whisper and respiration and the spinal dulness do not extend below the seventh cervical spine, and there is no interscapular dulness, conditions are normal. It seems probable that they are not normal when the bronchial voice, bronchial whisper, bronchial respiration and spinal dulness extend below the seventh cervical spine. They are certainly abnormal when there is interscapular dulness.

The whispering sound after the spoken voice, which will hereafter be referred to as "D'Espine's sign," was present in sixteen instances through the seventh cervical spine and in one through the third dorsal spine, when the changes in the spoken and whispered voices, the respiration and the dulness occurred at the normal level. The diagnoses in these cases were: No disease in four cases; delicate child in five cases; asthma in two cases; cervical adenitis, indigestion, enuresis, epistaxis, hip disease and chronic disease of the tonsils, each in one case. There were twenty-nine instances in which the bronchial voice, whisper or respiration or the spinal dulness extended lower than the seventh cervical spine. In thirteen of these cases D'Espine's sign was also present, in the other sixteen cases it was not. The diagnoses in these twenty-nine cases were: No disease in five cases; delicate child in three cases; cervical adenitis, nasopharyngitis, chronic disease of the tonsils, tracheobronchial adenitis and bronchitis, each in two cases; adenoids, chronic heart disease, chronic appendicitis, congenital heart disease, tracheitis, eczema, cretinism, myocarditis, general adenitis and orthostatic albuminuria, each in one case. These abnormal signs and D'Espine's sign were at the same level in six cases, while they extended lower than D'Espine's sign in seven instances. D'Espine's sign never extended lower than the other signs, except when it was the only abnormality. The presence of D'Espine's sign in seventeen instances without any other abnormal changes would seem to corroborate D'Espine's contention that it is the earliest evidence of abnormalities in the tracheobronchial region and that abnormalities can, therefore, be discovered by it before they can by other means. If this is so, it would seem reasonable to believe that it would persist after the appearance of other signs, presumably indicative of more serious pathologic changes. It was present in thirteen instances in which there were other signs, but it was absent in sixteen cases. That is, it either does not always persist after the development of other signs or the other signs may appear without it. Either explanation is possible. It seems more reasonable to suppose, however, that the other signs may appear first, rather than that it disappears after their appearance. If so, D'Espine's contention that it is always the earliest sign of pathologic changes in the tracheobronchial region is erroneous. This detracts but little from its value, however, because in many, and, perhaps, most, instances it evidently does appear before any other signs and does furnish evidence of abnormalities which can be obtained in no other way.

The spoken and whispered voices were both bronchial below the seventh cervical spine in six instances. In these cases the change from bronchial to vesicular respiration and from dulness to a normal percussion note occurred at the same level as the change in the spoken and

whispered voices. In no instance did the bronchial voice extend below the seventh cervical spine when the bronchial whisper did not extend below this level. In thirteen instances, however, the change in the whispered voice from bronchial to vesicular occurred below the seventh cervical spine when the change in the spoken voice was at the normal level. The change in the character of the respiration from bronchial to vesicular was lower than normal in six, and the dulness extended below the normal level in six of these cases. In one instance the extension of bronchial respiration through the second dorsal spine was the only abnormal sign. An extension of the bronchial sound of the whispered voice below the seventh cervical spine is more common, therefore, than that of the spoken voice. If the bronchial sound of the spoken voice is heard lower than normal so also is that of the whispered voice. It seems probable, therefore, that a change in the whispered voice takes place with slighter pathological changes in the tracheobronchial region than can be recognized by the spoken voice. The value of the change in the character of the respiration apparently lies about midway between those of the spoken and whispered voices.

Dulness on percussion over the spinous processes always extended below the seventh cervical spine when both the bronchial, spoken and whispered voices were below the normal level and in about one-half of the cases in which the bronchial whispered voice was below the normal level. It was usually at the same level as the change in the whispered voice. In two instances, however, it was lower than normal when D'Espine's sign was the only other abnormality, and in four it was the only abnormal sign. The low limit of dulness was the first dorsal in four cases, second dorsal in eleven cases, and third dorsal spine in six instances. It would seem from these figures as if the change in the percussion note is more delicate than that in the respiratory sound and that at times it may reveal pathologic changes not detectable in any other way. This may be the case, but it is somewhat doubtful, because it is more difficult to be certain of slight changes in the percussion note than in the spoken or whispered voices or in the respiration. Interscapular dulness is a relatively late sign of pathologic changes in the tracheobronchial region and, when present, signifies that such changes are considerable.

SUMMARY

The sign to which D'Espine called especial attention is a whispering sound heard after the spoken voice when the bell of the stethoscope is placed over the spinous processes. This sound is not heard under normal conditions. Normally the bronchial sound of the spoken and whispered voices and of the respiration does not extend below the seventh cervical spine. Dulness on percussion over the spinous processes stops at the same level. Extension of the bronchial sound of the spoken

and whispered voices and of the respiration, as well as of dulness on percussion, below the seventh cervical spine is abnormal and has the same significance as the whispering sound after the spoken voice. The whispering sound after the spoken voice, D'Espine's sign, is often the earliest and only abnormality. It may, however, be absent when one or more of the other signs are present. The whispered voice is a somewhat more delicate test of pathological changes in the tracheo-bronchial region than is the spoken voice. The respiratory sound has an intermediate value. The value of percussion over the spinous processes is about the same as that of the respiratory sound. Interscapular dulness is a late sign and is found only when the pathologic changes are considerable.