# THE DIAGNOSIS OF DISEASES OF THE CORD

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649436361

The Diagnosis of Diseases of the Cord by Joseph Grasset



Edited by Trieste Publishing Pty Ltd.
Cover @ 2017



www.triestepublishing.com

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Trieste

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## LOCATION OF LESIONS.

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GEORGE WAHR,
PUBLISHER,
ANN ARBOR, MICHIGAN.

# THE DIAGNOSIS

OF

# DISEASES OF THE CORD.

## INTRODUCTION.

Given a patient in whom a disease of the cord has been recognized, how can the exact location of the medullary change be determined clinically?

What system or systems of the cord are exclusively or principally attacked?

At what level of the spinal axis is the lesion located?

I wish to sum up here the elements of the answer the present neuro-pathology permits to this question, which is an interesting one to practitioners generally.

For if this chapter of clinical geography of the cord, founded by the chiefs of the French neuro-pathological school, Duchenne, of Boulogne, Vulpian and Charcot, seemed at the beginning a chapter of pure science, today it has been so enlarged, confirmed and made so exact that it is now absolutely practical, accessible and useful to all.

In the first place the necessary indications for surgical intervention were found here. This field increases every day in proportion as the operations become less dangerous and their technique is perfected.

Further, the different conditions called classically diseases of the cord are anatomico-clinical syndromes characterized by the fixity of their symp-

toms and the fixity of the location of the corresponding lesion. Whence it results that the diagnosis of this location of the lesion constitutes the complete diagnosis of this syndrome.

Thus to recognize progressive muscular atrophy or tabes, it is sufficient to recognize that the lesion, in the patient examined, is located in the anterior horns of the grey substance or in the posterior bundles.

Then, without denying the importance of anatomical and nosological diagnoses which when possible should complete the physiological, it may be said that the physiological diagnosis of the location of the lesion is absolutely of primary necessity for all physicians today.

The natural division of this little book is into two chapters. 1st. In the first chapter we will study the semeiology of the systems of the cord, that is to say, the signs by which is recognized the location of the medullary change in such or such system of this organ (anterior horns, posterior horns, posterior columns, etc). 2nd. In the second chapter we will seek to make a diagnosis of the location of the lesions.

The study of the clinical anatomy of the cord ought to be the appointed prelude and indispensable basis for pathology. For it is useless to refer to the ordinary anatomical description. *Anatomical anatomy* is useful to the clinician; it is the foundation. But *physiological anatomy* is still more necessary. A symptom is a function pathologically deviated. Then it is necessary to have a basis of functional or physiological groupings of organs to make a work useful in practical medicine.

This study which requires too much to be made here, will be the object of a special publication.

# I. THE DIAGNOSIS OF DISEASE OF THE MEDULLARY SYSTEM.

We will study successively in this chapter the eight following syndromes:

1. The syndrome of the posterior columns: sensory troubles and ataxia;

2. The syndrome of the antero-lateral columns: pareto-spasmodic state, contractures and intentional tremor.

3. The associated syndrome of the posterior and lateral columns: ataxo-spasmodic state;

4. The syndrome of the anterior horns: muscular atrophy;

5. The associated syndrome of the anterior horns and the lateral columns: spastic muscular atrophy;

6. The syndrome of the centro-posterior grey substance: dissociation of sensation, called syringomyelic (and vaso-motor troubles);

7. The associated syndrome of the anterior horns and of the centro-posterior grey substance (syndrome of the whole grey substance): muscular atrophy, dissociation of sensation, called syringomyelic, and vaso-motor troubles;

8. The syndrome of the lateral half of the cord: hemiparaplegia crossed.

For each syndrome we will study successively: 1st. The group of cases in which the lesion is limited to this system (lesions and symptoms); 2nd. Those in which the lesion attacks this system without being exclusively limited to it (lesions and symptoms); 3rd. The synthesis of the syndrome (clinical description, pathological physiology and differential diagnosis).

## 1. The Syndrome of the Posterior Columns: Sensory Troubles and Ataxia.

A. There is only one group of cases in which the lesion is systematically *limited* to the *posterior columns: tabes or progressive locomotor ataxia.*

Let us sum up the *lesions* and *symptoms.*

1. Although a gelatinous degeneration of the posterior columns of the cord was anatomically noted by Hutin in 1827, it may be said that the pathological anatomy of tabes began with Bourdon and Luys (1860) a short time after the masterly clinical description of Duchenne (1858).

In the first period a primary systematic sclerosis of the posterior columns in their entirety was claimed; in the second period (Charcot and Pierret, 1871) more was determined: The principal, initial lesson was localized in the external part of the posterior columns (posterior root zones).

Finally in the third period, the lesion of the posterior roots appeared most constant (Leyden and Vulpian); then the starting point of the lesion was placed in the ganglions (P. Marie, 1892) and tabes was made a disease of the sensory protoneurone (Brissaud 1895, deMassary[1] 1896).

In fact, the lesions of tabes, in the beginning is localized in the external bundle of Charcot and Pierret; then in the more advanced stage it includes the zone of the entrance of the posterior roots of Philippe, that is the zone of Lissauer and the cornu-root zone of Marie. Finally in a case of long dura-

[1] MASSARY (DE). Le tabes dors. dégenér. du protoneur. centrip. Th. Paris, 1896.—Voir aussi pour ce paragraphe: PHILIPPE. Le tabes dorsalis. Paris, 1897; et GEREST. Les affections nerveuses systématiques et la théorie des neurones. Paris, 1898.

tion the column of Goll is invaded, especially in the upper portion of the cord. The principal and constant lesion is in the exogenous fibres, root fibres, cylinder axis prolongations of the ganglions. The endogenous fibres often found intact (Marie, Strumpell), have also been found involved (Philippe); the descending fibres at first (triangle of Gombault and Philippe, oval center of Flechsig, postero-internal band, comma tract of Schultze), the ascending fibres later (the cornucommisural zone dying last of the posterior columns). But all these endogenous fibres will be attacked only in the second stage consecutive to the lesion of the exogenous root fibres.

In the grey substance the lesion of the cells of the vesicular column of Clarke is doubtful or inconstant; the alteration of the nerve fibres of this same region (the collaterals given off by the posterior root fibres) is on the contrary very frequent.

The lesion of the posterior root is very frequent but not constant. In the ganglions the cells as a rule are intact.[2]

Let us omit all extra-medullary lesions (nerves, bulb), which are of no interest here.

Brissaud's conception then that tabes is a lesion of the sensory protoneurone may be admitted. Only, if we do not wish to admit a dynamic or unrecognized lesion of the ganglion in many cases, it is necessary to say that the primary, essential location of the lesion in tabes is the intra-medullary part of the sensory protoneurone, that part of the posterior column which we know contains the cylinder axis prolongations of the spinal ganglions.

If with Brissaud we compare the neurone to a tree, the sensory protoneurone is attacked in its

[2]Voir sur ce point important: GEREST. *Loc. cit.*, p. 235.