

## RHEUMATIC FEVER IN RELATION TO THE THROAT.\*

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Considerable interest attaches to the undoubted association between acute rheumatism and certain affections of the pharynx and larynx. In this country attention has been particularly directed to the subject since J. K. Fowler published the particulars of twenty cases of acute rheumatism ushered in by tonsillitis. The throat symptoms preceded the rheumatic attack by a few days, or even a month, and his statistics point to a history of throat symptoms in 80 per cent of cases of rheumatic fever.<sup>1</sup> In the first edition of his book, published in 1878, Lennox Browne insisted on the rheumatic diathesis being the principal etiological factor in quinsy.<sup>2</sup> In the last edition (1899) he states that although he has had reason to somewhat modify his views, he reiterates the opinion that the arthritic diathesis invariably exists in those patients who are subject to recurring attacks of acute tonsillitis. He traces this view of rheumatism as a cause of angina to Musgrave in 1710, Sauvage in 1771, and he discovers an allusion to it by John Ball in 1762.

We have thus brought before us two different, but not necessarily contradictory, points of view. The first is, that in a considerable number of cases of rheumatic fever the poison enters the system through the tonsil, the inflammation of which may be the earliest indication of the systemic affection. The second is that certain inflammations of the tonsil occur with greater frequency in patients with an arthritic diathesis. Each of these views is worthy of some consideration.

The tonsil has been well termed by Gerhardt a physiological wound—an opening into the system which, if not maintained in a healthy condition, may allow the passage of general infection. How true this may be is shown by Jessen, who has recorded four cases of serious general infection from the tonsils—acute articular rheumatism, acute pyemia, streptococcal and staphylococcal pneumonia. In spite of minute research, no other cause than an angina could be discovered for these infections; and, indeed, in two cases the tonsils appeared absolutely healthy, and it was only at the autopsy that in

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the interior of the tonsils were there found purulent foci capable of explaining the cause of the general infection.<sup>3</sup>

It might be well in connection with this subject to bear in mind two *chief functions of the tonsils*: 1. As part of the hemopoietic system they form young leucocytes, most of which pass into the circulation, while some escape on the free epithelial surface, where they may, perhaps, exercise some protective action. 2. They excrete old leucocytes, which probably carry off with them effete products. These two functions are most active in childhood and youth, when all the lymphatic organs are specially active, and when the thymus—a large blood-forming gland—is disappearing.<sup>4</sup> Pluder maintains that while the whole mucous membrane has protective powers, the tonsils are its weakest point, and cannot even protect themselves, as shown by their liability to inflammation.

An acute and evanescent form of angina has been described by Trousseau in one of his lectures as preceding rheumatic fever and disappearing on the development of the articular symptoms.<sup>5</sup>

H. L. Wagner concludes that the rheumatic affections are produced by germs migrating from the tonsillar tissues into other parts of the body. He founds this opinion on the fact that he discovered the same micro-organisms (*staphylococcus albus* and *aureus*, Fraenkel's pneumococcus, etc.) not only in the diseased tonsil, but in the urine of nearly all the cases, and in two instances in the fluid withdrawn from the knee-joint. He records ten cases, and notes that the joints which are mostly in use are the ones generally affected; for instance, the arytenoid cartilages of the larynx of singers (five cases), the knee-joints of shoe dealers, owing to the constant kneeling posture (two cases), and the wrist joint of a violinist (one case) and bookkeepers (two cases).<sup>6</sup>

Groedel<sup>7</sup> has observed twenty-one cases in which tonsillitis has been followed by rheumatic arthritis, this sequence being sometimes frequently repeated in the same patient. His view is that the tonsillitis is the local point of infection from which "point de départ" the cocci invade the organism and produce the symptoms of rheumatic arthritis. He carefully points out that for a tonsillitis to be followed by rheumatism there must exist a predisposition to this latter affection, otherwise the local tonsil affection might provoke disease of the kidneys or glands, or simply rheumatic-like pains in the back and limbs, or simply remain throughout a local disease of the tonsils.

The statistics of a Collective Investigation Committee<sup>8</sup> show that of 665 patients there were 158 (24.12 per cent) who had previously

suffered from tonsillitis; twenty others had suffered from sore throat of uncertain nature. If these were added, the proportion would be 27.17 per cent.

In his Milroy Lectures, Newsholme expresses his view that it is probable that in rheumatic fever the specific infection enters the system at the tonsils or some other part of the naso-pharynx.<sup>9</sup>

The view that tonsillitis is often of rheumatic origin, and is the initial manifestation of acute rheumatism, if not the actual primary lesion, is endorsed by some observations of Bertram Abrahams.<sup>10</sup>

His conclusions are as follows:

1. The more common varieties of rheumatic sore throat fall into two main categories—faucial erythema, and tonsillitis proper.

2. Faucial erythema is more common in adults; rheumatic tonsillitis in children, in whom it usually assumes the follicular type, quinsy being more common in older subjects.

3. Faucial erythema is an initial manifestation of acute rheumatism; tonsillitis may be the initial primary lesion actual.

4. Many cases are now definitely on record in which endocarditis has followed a non-scarlatinal tonsillitis unaccompanied by joint pains. In numerous other instances the tonsillitis has immediately preceded an attack of arthritis or of chorea.

5. The presence of the same micro-organisms in the tonsils, joints, blood and urine is evidence in favor of the participation of pyogenic cocci in the etiology of rheumatism. The most common organisms were streptococci; more rarely staphylococci, and the Fraenkel-Weichselbaum diplococcus.

From these views it is evident that the author regards the tonsils as the port of entry of the rheumatic virus.

In a very full paper, in 1894, on the relation of sore throat and acute rheumatism, Buss<sup>11</sup> came to the conclusion that the throat is in many cases the site of the entrance of the rheumatic infection.

The observations of Poynton and Paine<sup>12</sup> carry these observations considerably further. In one case they found after death from rheumatic fever that both tonsils were large and inflamed, even although the illness had been one of long duration. Before death there had been an exacerbation of rheumatism, and this development of tonsillitis is known to occur not only at the commencement but also during the course of a prolonged rheumatic attack.

In another case they demonstrated that if certain diplococci are isolated from the throat during an attack of angina faucium in a patient with rheumatic fever, and then interjected intravenously into a rabbit, they will cause non-suppurative valvulitis and pericarditis.

## CRITICISM OF THE TONSILLAR-INFECTION THEORY.

In a *Thèse de Paris* presented last year the view is taken by Emile Poingt that the *articular complications* which so frequently occur with tonsillitis *should not be confounded with essential acute rheumatism*. The occurrence of these complications is not in relation to the character of the tonsillitis; they are met with in any age, but most frequently in adult life. They may set in any time, from the first day of the sore throat up to the onset of convalescence, but as a rule they appear and disappear with the angina. The cause is microbial, the agents of the articular lesion being the same as those of the tonsillitis—streptococci, staphylococci, and pneumococci—which travel by the blood channels. In other cases the bacteriological examination is negative, and then we must attribute the complications to the toxins developed in the pharynx. Pathological changes are found in the loss of lustre in the synovial membrane of the joints, with more or less considerable serio-fibrinous exudation. In the suppurative arthritis there is loss of substance, false membrane, softening of the cartilages, and sero-purulent or purulent exudation. The arthritis of angina, according to Poingt, attacks numerous joints. The small joints or the knee are chiefly affected. With regard to treatment, he particularly insists on the uselessness of salicylate of soda, and the necessity of preventive treatment by rigorous antiseptics of the mouth.

Ruault is another observer who states that he has never been able to obtain from the administration of salicylate of soda in tonsillitis sufficient evidence to convince him that the treatment had any specific action, and that, consequently, its results pointed to the rheumatic nature of tonsillitis.<sup>13</sup>

Cobb,<sup>14</sup> from a study of forty-four cases of peritonsillar abscesses, finds that no causative relation could be proved to exist between rheumatism and peritonsillar abscess.

## RHEUMATIC FEVER A SEPTIC INFECTION FROM THROAT.

From a review of the subject by Emil Mayer<sup>15</sup> he comes to the conclusion that an endocarditis following tonsillitis is not necessarily to be looked upon as rheumatic, but it is rather due to an infection by bacteria gaining access to the body through the tonsils, or to the toxins of such bacteria. He quotes several instances, and gives a list of diseased condition which may be found to follow anginas.

## TONSILLITIS AS A RHEUMATIC MANIFESTATION.

It is difficult to determine whether tonsillitis or pharyngitis can occur as an isolated rheumatic manifestation. Haig-Brown obtained

a rheumatic history in seventy-six out of 119 cases of sore throat. A. E. Garrod studied 169 cases of pharyngitis and tonsillitis and showed that there was something to suggest a possible rheumatic origin in about one-third of the cases of each variety—that is to say, in this proportion of cases there was either a family or a personal history of rheumatic fever.<sup>16</sup> The writer adds that probably the proportion of one-third is considerably above the truth, and in this surmise he is no doubt perfectly right, for the progress of laryngology in the last decade has tended to show that a large number of cases of pharyngitis are secondary to purulent affections of the nose or catarrhal conditions of the stomach.

W. B. Cheadle observes that the view that in certain cases tonsillitis is a minor expression of the rheumatic diathesis cannot be seriously disputed; indeed, he regards rheumatism as a frequent, potent, and well-established cause of tonsillitis.<sup>17</sup>

#### CRITICISM OF THE RHEUMATIC-TONSILLITIS THEORY.

On the other hand, G. B. Hope<sup>18</sup> is disposed to *question the theory*, now so universally agreed to, that amygdalitis is chiefly predisposed to by a rheumatic diathesis. Although he has had a sufficient number of cases of acute angina examined independently by advocates of the rheumatic theory, the results have been altogether negative. He also points out that it is rare to meet with examples of recurring angina in those who carry recent, or present unmistakable, evidence of a rheumatic attack. In addition, it is noteworthy that intrinsically the tonsil in later life becomes less and less subject to inflammation, notwithstanding that the gouty age is more confirmed. Then peritonsillar abscess is clearly of infectious origin, and to a similar cause is probably due the inflammation of the tonsils which may follow intranasal operations. If, therefore, observes Dr. Hope, remedies addressed to the rheumatic diathesis are given in either of the two latter instances, the administration must be either erroneous in its practice or must be understood to act independently and by methods not distinctly stated. In fact, he claims that treatment by anti-rheumatic remedies does not abbreviate the ordinary course—natural course—of an ordinarily severe amygdalitis.

That salicylate of soda is not a specific against tonsillitis is shown in a paper I wrote in 1884,<sup>19</sup> in which reference is made to a patient who had been relieved of rheumatic fever. Six days after admission to the hospital he was free from pain and fever, but was still taking 20 grains of salicylate three times a day. Although under the influence of the drug, he developed acute tonsillitis and a temperature of 103.6°.

## ROUTE OF TONSILLAR INFECTION.

For the present the question may be left out of discussion as to whether the "open door" of infection is through the points denuded of epithelium<sup>20</sup> or not through the visible superficial parts and follicles but through the interfollicular spaces<sup>21</sup>; or, finally, not through the tonsil proper at all but by way of the supra-tonsillar fossa.<sup>22</sup>

## CONCLUSIONS.

The foregoing pages indicate that there is a general acceptance of the view that an undoubted association exists between rheumatism and tonsillitis. This is expressed from two points of view: one is that the rheumatic poison enters the system through the tonsil, the inflammation of which is the first local expression of the disease; the other view is that tonsillitis is, in certain cases, one of the rheumatic manifestations of the rheumatic diathesis. These views are supported by numerous observations, of which I do not pretend to have given more than a selection. Many of the clinical records are too fragmentary to advance the subject, and it seems to me that the various theories which have been propounded are somewhat premature, and that it is much safer to await further pathological investigation to show which of our clinical deductions are trustworthy.

Further knowledge is required as to the nature of rheumatism itself, and also as to the various causes and forms of tonsillitis associated with it. So far peritonsillar abscess, or quinsy, is one form which is not accepted as commonly of a rheumatic nature. It is not mentioned by Fowler or Mantle,<sup>23</sup> and Hingston Fox<sup>24</sup> excludes it as a rheumatic disease. Trousseau does not particularly refer to tonsillitis as a forerunner of rheumatic fever, but to an evanescent form of sore throat. Evidently the subject will bear closer investigation.

The present state of our knowledge on the relation of tonsillar affections to rheumatism might be summarized as follows:

1. It is undoubted that a certain number of cases of acute rheumatism are preceded by an angina in a proportion varying from thirty to eighty per cent.
2. Both rheumatism and angina have many etiological points in common—season of year, cold, wet, fatigue, depression, vitiated air, etc.
3. The connection of angina and rheumatism, though undoubted in a number of cases, is not yet clearly established.
4. The tonsil may be the port of entry of the rheumatic virus, and this even although the naked-eye appearance of the throat gives no indication of its being affected.

5. The particular affection of the throat which is associated with rheumatism is not yet established. Apparently it is not peritonsillar abscess (quinsy).

6. Peritonsillar inflammation does not appear to be arrested by the administration of anti-rheumatic remedies. Many cases of parenchymatous and lacunar tonsillitis, on the contrary, are considerably benefitted by the administration of salicine or salicylate of soda. That this action proves the rheumatic nature of the disease cannot yet be accepted.

7. The question requires further research in two directions: One in differentiating the various forms of angina, and settling the one which is associated with rheumatism; the other in further research to discover the true nature of rheumatism.

#### THE PHARYNX.

*The Naso-pharynx.*—De Havilland Hall<sup>25</sup> has seen cases in which the pharyngeal tonsil (Luschka's tonsil) was affected independently of the faucial tonsils, and in which the pain and distress were much greater than is usual in ordinary tonsillitis. He believes that in some of these cases the rheumatic poison is the cause of the affection.

*The Oro-pharynx.*—In the more acute cases of rheumatic pharyngitis, according to Watson Williams,<sup>26</sup> the soft palate, especially toward the free margin, the pillars of the tonsils fauces, the tonsils and posterior pharyngeal wall will be found somewhat swollen and heightened in color, and in some cases the uvula is edematous and distinctly swollen. There are, however, no characteristic features which help us, by inspection only, to recognize the rheumatic nature of these throat symptoms; the diagnosis is founded on the pain, stiffness and inflammation in the throat preceding, accompanying, or following a rheumatic attack.<sup>27</sup>

Benign ulcers in the pharynx have been seen by Freudenthal, who states that he is unable to interpret their etiology in any other way except that they are due to rheumatism. He refers to similar cases observed by Thorner, Heryng and Westbrook. The condition cannot be common, and, until our knowledge of rheumatism is further advanced, it must surely be difficult to differentiate these rheumatic ulcerations from the more common infective ones.<sup>28</sup>

Granular pharyngitis is claimed by Marage<sup>29</sup> in many cases to be simply a manifestation of the hyperacidity which is characteristic of "arthritis." It is somewhat difficult to appreciate what French authors mean by this "diathesis," which is so frequently referred to in their writings.

## THE NOSE AND RHEUMATIC INFECTION.

It is well known to laryngologists that operations on the nose are sometimes followed by attacks of tonsillitis. The observations on the sequence of these two facts are now sufficiently numerous to establish them as cause and effect. A case recorded by Kronenberg<sup>30</sup> is interesting as showing that a nasal operation may be followed by acute rheumatism. He operated on a patient with a cold snare for a papillomatous growth of one inferior turbinal. This was followed by an angina, which ran a favorable course. A month later the same procedure was carried out on the other nostril. Six days later the patient had a rigor, next days the knees, ankles, elbows and shoulders were swollen and painful; no sore throat; no discomfort in the nose. Swelling, pain and fever disappeared with salicylate of soda. Shortly afterwards there was a relapse, with heart complications, and the patient died.

## THE LARYNX.

The localization of acute inflammation in the crico-arytenoid joint is a well-established affection. It may precede a generalized attack of acute rheumatic fever, and until the symptoms of the latter appear the diagnosis is sometimes difficult; it may occur during the course of the acute illness; and it may be met with as an independent affection. The patient generally complains of some pain and dysphagia, with tenderness on palpating the region of the crico-arytenoid joint—*i. e.*, the outer and upper border of the thyroid cartilage. The pain is worse when the patient is recumbent, particularly if he swallows in that position. Inspection with the laryngoscope may reveal nothing in the early stages, or until the soft parts over the articulation have become inflamed, when they may be seen to be red and swollen. The movement of the vocal cord on the same side is at first sluggish, and is said by some to be jerky. With the development of inflammation or effusion into the joint the vocal cord on the same side becomes fixed. We are then met with the difficulty of diagnosing between a rheumatic crico-arytenoid inflammation, and paralysis of the recurrent laryngeal nerve. In many cases the following symptoms, tabulated by Escat,<sup>31</sup> will help in distinguishing the two conditions: Acute inflammation of the crico-arytenoid articulation may be diagnosed from recurrent paralysis by the following signs: 1. Dysphagia. 2. Painful cough. 3. Occasional tumefaction over the arytenoid. 4. Sharp pain on pressure along the posterior border of the thyroid cartilage. 5. The healthy arytenoid is not tilted forward on to the affected one, and (according to Grabower) the healthy vocal cord does not during adduction pass across the median line towards the other side.



In addition, this affection of the crico-arytenoid joint is usually associated with (*a*) the existence or pre-existence of an acute pharyngeal catarrh; (*b*) laryngeal hyperemia; (*c*) a more or less pronounced feverish condition; and (*d*) extra-laryngeal manifestations of arthritis.

When recovery takes place more or less permanent disturbance of movement may remain in the form of partial or complete ankylosis. The difficulty of diagnosis of this condition is analogous to that which we should experience in distinguishing between an ankylosis of the shoulder joint and a paralysis of the deltoid, if we were not able to manipulate the patient's arm. It can often only be made when the vocal cord is fixed in a position which is atypical of nervous or muscular palsy. Permanent thickening, in addition to the abnormal fixation, would be suggestive of periarthritic inflammation. As a rule it is safer to carefully exclude the possibility of any central or peripheral paralysis before ascribing the fixation of a vocal cord to complete ankylosis of the crico-arytenoid articulation. Even then other causes, such as syphilis, have to be carefully excluded.

The treatment of this rheumatic ankylosis is generally hopeless.

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