ARTHRITIS ASSOCIATED WITH LESIONS OF THE GENITO-URINARY TRACT.*

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With the constantly increasing experience with the origins of the arthritides, and the recognition that they all are practically a manifestation of some form of toxemia, the recognized sources of the infection are being given more attention in two particulars: (1) the various conditions of the special portals of entry under which the infection may take place; and (2), the special joint manifestations which are associated with the various sources of toxemia. It is not to be expected that a toxemia from a given source will always develop distinctively characteristic joint symptoms, and there is no reason why the clinical picture of the inflammatory process caused by one particular germ should, at any given period of the disease, be clearly distinct from that caused by another similar one, acting on the same material, and yet in the same way that the tubercular bacillus produces suggestive clinical signs and symptoms, so it may be expected that other forms of intoxication will have some characteristic features in the joint involvement. Approaching a case by the arthritic doorway, which is the usual one, the method of attack must be similar to the procedure of the detective,—to ferret out the hidden source of the disturbance. The special characteristic joint manifestations may give a clue for the direction of the search, and one after another must be run down until the hidden source is found. In order to make a thorough examination a definite route, which will include the common known causes, is of help, and although no schedule can replace a thorough method of examination, it may be of value in expediting that part of the examination which has already become routine, in order to cover quickly the well recognized sources of infection, and allow time for the study of the unusual and less evident factors.

The well known sources of infection can be divided into three general groups, which although today may not be absolutely proved, yet serve as a working basis until further knowledge either demonstrates their validity or modifies their position in physiological chemistry.

ETIOLOGICAL FACTORS.

- (a) Bacteria or bacterial toxins
 - Naso-pharynx
 - Tonsils

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- Teeth
- Nasal cavities
- Neisser
- Grippe
- Acute infectious diseases
- Exanthemata
- Typhoid
- etc.

- Suppurative processes
- Otitis media
- Puerperal
- etc.
- Tuberculosis

- (b) Chemical toxins
 - Auto-intoxication, gastro-intestinal
- (c) Chemical irritants
 - Uric acid
 - Oxalic acid

Among the sources of infection there are three which are now actively prominent among the larger number known to exist, viz., the tonsils, the teeth, and the genito-urinary tract, and none more prominent than the latter. When, in the detection of the source, it is found that the portal of entry is the genito-urinary tract, the case can be studied in the light of some well established data. This portal of entry differs from some others in one respect, in that the bacillus in question is more definite, that is, we are to expect either the gonococcus or the colon bacillus, and the arthritic conditions having a more uniform origin should have more definite characteristics, and this seems to be in general true, either because of the definite relation between the origin of the toxemia and the arthritis, or because this group has had the opportunity of more isolated study, and is better understood.

We may consider the joint manifestations connected with the genito-urinary tract under two heads: (1) those from the Neisser germ, and (2) those from the colon bacillus.

(1). *Gonococcus infection.* The occurrence of an arthritis in the course of the acute urethritis is so familiar that reference to it only need be made. The usual result is recovery with little or no permanent impairment, but unfortunately this is not always the case, and it is with this less common and less favorable type that we should interest ourselves, both in its detection and in its treatment. Of this we have two distinct types.

First, the acute non-articular or residual non-articular involvement, running an acute and persistent clinical course, and resulting in loss of joint function. This infection has certain characteristics.

NEISSER—BACTERIAL

- Onset, sudden
- Non-articular or residual non-articular
- Clinical symptoms, extreme
- Pain, acute
- Sensitiveness, acute

Deformity, marked
 Capsular thickening, marked
 Pericapsular swelling, marked
 Indication of involvement of articular structures
 Persistent acute symptoms
 Joint Damage { From acute inflammatory process
 { Obliteration of joint cavity
 { Cartilage destruction
 { Ankylosis { fibrous
 { bony (incomplete)

Bacillus found in joint.

End result,—

(a) Loss of motion from obliteration of joint cavity by complete adhesion of the capsule to the surfaces of the joint, or by

(b) Destruction of the cartilage with ankylosis (incomplete).

The cases operated upon, and open to inspection have shown a very high degree of vascularity of the synovial surface, deep red in color, a very great thickening of the capsule, not only of the synovial portion, but also of the fibrous portion (often wrongly called peri-articular thickening). It is not common to find the gonococcus free in these joints, yet sometimes pure cultures are obtained, and in view of this and of the fact that the gonococcus is short lived and not always easy to find, and of the very great clinical contrast with the usual arthritis, the logical inference is that these cases are due to the presence in the joint cavity of the bacillus itself, and that the inflammatory process is a pure bacterial one. This has the analogy of other infections of the suppurative forms, in which the joints directly infected show greater clinical severity, and tendency to actual suppuration.

Therefore we have for distinctive characteristics:—an arthritis of sudden appearance, giving evidence of a very acute synovial inflammatory involvement, as shown by acute pain, sensitiveness, deformity, persistent symptoms, all of which indicate an inflammatory process in both parts of the capsule,—a process which later shows an inherent tendency to marked contraction, with very strong adhesions, or even destruction. In addition to those clinical signs, the presence of the bacillus is frequently found in very many cases. In other words, an acute inflammatory, non-suppurative, destructive arthritis, a very distinctly different picture from that of the other forms of arthritis, and one which, for the contrast, we may term a "bacterial infection."

The second type of infection is the more common variety. The characteristics of this infection are:—

Onset, sudden or gradual
 Repeated infections
 Polyarticular (usually)

Clinical symptoms mild
 acute
 Capsular thickening, moderate
 Persistent symptoms
 Joint Damage { cartilage, nutritive
 { adhesion
 { from prolonged attacks
 { from repeated attacks
 Bacillus not found in joint

Adhesions, as a result, are not uncommon, and impairment of the integrity of the joints comes after prolonged and after repeated attacks, but ankylosis from destruction is rare. When the joint is opened the bacillus is not found, the injection of the synovial membrane shows less congestion, and the fibrous capsule is much less thick.

Therefore we have for distinctive characteristics: an arthritis, not of sudden appearance; perhaps with a history of previous attacks; often of acute but not extreme virulence; polyarticular in distribution; with marked but not extreme pathological changes in the capsule; with a strong tendency to the formation of adhesions, but not tending to destruction, except by prolonged and repeated attacks. In other words, we have a mildly inflammatory process, multiple, slowly damaging arthritis from toxic infection. The injury in these cases is by interference with nutrition rather than by the acuteness of the inflammatory process.

Both of these types of joint affections are seen in the course of urethral infection, and they are so different in their pathology and in their clinical results that it is essential to recognize them for what they are. Moreover, it is necessary to so bear in mind that this joint invasion does occur at any period after the primary urethritis, that it is always an expected guest. An apparent (to the patient) freedom from the urethritis for years is no surety of safety. The lingering trouble is far back in the posterior urethral region, which serves as a resting place for many years. The acute form of the arthritis naturally is associated with the early stages of the urethral infection, but also appears in the later. It is, however, a question if this form occurs at a time when the urethral condition is entirely quiescent. This differs decidedly from the second toxic form, which so often appears with an entirely external, quiescent urethral condition. Moreover, there is no relation between the apparent extent or activity of the latent urethral disease and the virulence of the toxic arthritis.

(2). Colon bacillus infection. The second form is the involvement of the joints by the invasion of the colon bacillus. Much less is known of the special joint manifestations of this than of the Neisser germ, and the actual differentiation must rest on the localization of the focus, and through this of the detection of the kind of infection. It is perhaps less important to determine the identity of the bacillus than to lo-

NEISSER—TOXIC.

cate its workshop, since the radical method of treatment is the absolute eviction of the tenant. Undoubtedly many cases, which in the past have been suspected to be of Neisser origin have been of colon bacillus sources, for it is often the experience that an arthritis with an old Neisser history, showing post-urethral or prostatic troubles, but without positive Neisser culture, has shown decided improvement after clearing up of the local trouble. Although much less is understood of the characteristic joint manifestations of this infection, some general points are suggestive.

COLON BACILLUS.

Onset { sudden
gradual
Polyarticular
Spine frequently invaded
Persistent acute involvement
General condition—affected.
Detection of focus

Other than that we are dealing with a severe, persistent arthritis of multiple distribution, having a predilection for the larger joints, and very frequently for the spine, there is no suggestion that the infection is due to this rather than to another cause. The differentiation must rest on the detection of the focus.

It is interesting to see how the method of treatment has undergone the change from directing the attention to the joint manifestation to that of the cause alone, and how only until after the source of the infection has been eliminated does the condition of the joint receive attention. Moreover, this is the only reasonable method of treatment. With the detection and elimination of the focus, the repair of the damage already done can then have attention, and the methods used must necessarily depend on the amount of, and on the kind of damage which the joint has suffered. In the toxic cases, the injury is in general of the character which may be called nutritive, rather than purely inflammatory, and must consist of those many means of improving nutrition, promoting absorption of old exudate, increasing motion, etc., which the particular joint demands. The treatment of these is so general and so long, that mention only of it should be made here.

It is the acute joints, described as the first of the group, that demand our interest in this connection. The course to be pursued with them depends on the acceptance of the theory of their etiology, and it is necessary to first decide whether the joint is the host of the germ itself, and this must be done by the clinical picture, and the relation to the urethral condition. If the arthritis is of the bacterial type radical treatment offers the best and surest method of relief. Joint surgery is too often left until the damage is done and no good can be expected, or further harm possible. The essential is that it should be done in the way of joint surgery.

In the very early periods of this type of joint the thorough hot lavage of the joint offers the best chance of the rapid disappearance of the acute joint involvement, at least in the period in which the persistent acute clinical signs indicate that the germ is still an occupant of the joint cavity. Under no condition must the joint be left open; on the other hand, it must be sewed up by the most secure method possible.

The later stage of this acute form is a long, persistent period, in which the capsule, so extensively infiltrated, is beginning to contract, clinging to the bone and forming the strong adhesions to which this form of arthritis is particularly prone, and which are most extensive and most firm. The short lived bacillus is in all probability dead, and has left the results of the inflammatory process with which to be dealt. The chief indication now is to prevent the formation of adhesions during this contracting stage. This stage is the ideal one for the use of the oil inflation, but to be successful two conditions must be thoroughly complied with. First, it must be done by the open incision, in order that the adhesions already formed may be disposed of, and the pockets resulting from them be obliterated. This must be accomplished with the least possible violence to the joint cavity. Second, the oil must be left in the joint with the capsule under a very distinct tension. The capsule must be kept ballooned out sufficiently to keep the synovial surfaces from coming in contact, either with each other, or with the bone surfaces.

Of the local treatment of the colon bacillus form, my experience is too limited to formulate any plan, but in the present state of knowledge, it is to act on the general plan of elimination of the focus, and the local treatment of the joint according to the method used in the toxic infection.

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A REPORT OF THREE CASES OF THE ERYTHEMA GROUP.*

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I WISH to report three cases which may be grouped under what Osler, following the French writers, calls the Erythemas. He includes under these, simple erythema, erythema multiforme, erythema nodosum, erythema exudativum, urticaria and angioneurotic edema. He reported 29 cases. To quote him, "The whole group of symptoms is really a manifestation of as yet an unknown mischief, which in varying doses in different constitutions, at one time at-

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