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## Chronic prostatitis

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CHRONIC PROSTATITIS

Senior Thesis

by

Willis D. Wright

College of Medicine  
University of Nebraska  
1931

## CHRONIC PROSTATITIS

(1) From a historical standpoint, knowledge of the prostate dates back to Biblical times, it having been mentioned by Herophilus about 350 B.C. Nicola Massa, a Venetian physician, living in the 16th century, generally is accredited as having discovered and discussed the prostate. Reolanus, at about the same time, was the first to suggest that the bladder could be obstructed by swelling of the prostate.

Ambrose Pare, the renowned surgeon of the 16th century, originally a blacksmith and a barber's apprentice, was the first to recognize that hypertrophy of the prostate was the cause of strangury. Steinach in 1894 demonstrated that the removal of the prostate and seminal vesicles in white rats prevented the successful fertilization of the female. Further experiments have shown that the secretion of the prostate maintains motility of spermatozoa. To the prostate has been ascribed the function of activating spermatozoa. Verdie in 1838 was the first to give an accurate description of the pathology of prostatitis. In the early 90's treatment of disease of the prostate by massage came into popular favor. Pasner of Berlin, in 1893, mentioned the cure of chronic prostatitis by repeated digital expression and two years later prostatic massage was adopted by the Royal Institution of Massage at Stockholm. Prior to the general acceptance of this therapeutic procedure,

disease of the prostate was treated by applications to the perineum in the form of counter irritation, heat, cupping, leeches and the like.

in 1903, Young, Georghy, and Stevens published their comprehensive report of the pathology of posterior urethritis, prostatitis and seminal vesiculitis (this was repeated in French literature). Thus we realize that our present knowledge of the prostate gland has come about slowly through the observations and experiments of many ancient and modern urologists. Prominent among these that might be mentioned are Thompson, Finger, Fuller, Guyon, and Oberlander.

(2)The prostate gland begins to develop at the third month of fetal life. The tubules which compose it make their first appearance as solid epithelial outgrowths from five distinct parts of the prostatic urethra. These solid masses of cells, that stain very deeply, soon become circularly arranged around lumen. Branches are found very early. The five original foci from which groups of prostatic tubules take their origin are located as follows: on the floor of the urethra between the neck of the bladder and the openings of the ejaculatory ducts and utriculus prostaticus, one in each prostatic furrow - solid longitudinal folds on the outer side of the epithelial wall of the urethra - and on the sides of the urethra, on the floor of the urethra below the openings of the ejaculatory ducts and the utricle and on the ventral or anterior wall of the prostatic urethra. The tubules originating from these foci by the further growth and development of stroma around them become the middle, right and left lateral, posterior and anterior lobes respectively. In early fetal life they are widely separated from each other but in other stages the separation between the middle and two lateral lobes is not very great. Lowsley found no intermingling of tubules in any of his specimens but found in many places in the new born the tubules of the middle lobe side to side with those of the

lateral lobes, there being no definite capsule separating them. The separation of the posterior lobe from the others is complete as there is rather a dense layer of fibrous tissue between it and the lateral lobes. The anterior lobe is widely separated from the two lateral lobes. The first appearance of muscle fibers developing around the tubules of the gland is found at the sixteenth week. By the twenty-second week these fibers are well developed. The musculature continues to become thicker and thicker until at birth some of the tubules are surrounded by a very dense muscular layer.

(3) In the normal prostate the glands are divided into three categories according to their length. First, the very short and simple mucosal glands which arise principally on the lateral and anterior walls of the urethra at the level of the verumontanum which are also found on the posterior wall in the region of the sphincter; second, there are somewhat longer and more branching glands called submucosal glands which are principally in the antero-posterior direction, on each side of the urethra and curved around posteriorly to empty into the postero-lateral sulci of the urethra, at either side of the verumontanum; third, the principle mass of the prostate gland is made up of glands which are long and show much branching and which lie outside of the two above mentioned gland groups and curve around to enter the posterial lateral sulci.

(4) The prostate is a sexual organ lying in front of the bladder and surrounding the prostatic urethra. In shape it is an irregular, truncated cone, aptly compared to a horse chestnut. Its apex rests against the posterior layer of the triangular ligament. Its base, toward the bladder, is pierced by the urethra and below by the ejaculatory ducts. Its upper (anterior) and lateral surfaces are round, its lower (posterior)

surface presents a boss on each side of the median line.

The diameters are: length, 33 to 45 mm.; width at base, 34 to 51 mm.; thickness, 13 to 24 mm. Its weight is 16 to 24 grams. In position it is 8 to 12 mm. below the symphysis and its apex is 30 to 40 mm. from the anus. It is supported by the pubo-prostatic ligament, the levator prostatae and the anterior fibers of the levator ani. It is fixed in its relationship to the urinary organs by the urethra which pierces it from base to apex as well as by the decussation of its muscular fibers with those of the bladder and urethra. It is separated from the rectum by the fascia of Denonvillier, an off shoot from the pelvic fascia which passes down behind the bladder, vesicles, and prostate, separating these from the rectum. Within this fascia and surrounding the prostate, lies the prostatic plexus of veins. The prostate is divided in two parts by the ejaculatory ducts. These enter the prostate close together at its base and run through it obliquely opening finally into the prostatic urethra. The glands making up the prostate are of the compound racemose type. They are collected into tubules, 15 to 32 in number, each lobule surrounded by a layer of muscle and emptying by a duct into the lateral portions of the floor of the prostatic urethra and pointing towards the openings of the ejaculatory ducts.

The arteries are derived from the branches of the middle hemorrhoidales and inferior vesicle arteries. The pudendal plexus of veins surrounding it, into which the veins of the penis open, communicates with the vesicle plexus and drains into the hypogastric vein.

The prostate is the sexual heart, acting as a muscle, a sensory organ and a gland. It has nothing to do with the act of micturition but is merely accessory to this act.

Prostatitis or inflammation<sup>m</sup> of the prostate may be divided into two groups according to bacterial etiology - the specific or gonorrhoeal type and the non-specific or secondary focal type. The latter is a "new" disease, that is, it has been brought to our attention by the development of the theory of focal infection.

The frequency of acute prostatitis and seminal vesiculitis is well recognized, but we fail to realize or perhaps neglect the fact that chronic prostatitis and seminal vesiculitis are extremely common diseases. It is a deep seated disease and one that often presents vague, indefinite, and obscure symptoms requiring months of treatment. Its importance and far reaching effects as a focus of infection have not received adequate attention in the literature. Every physician realizes the significance of infection in or about the tonsils, teeth and paranasal sinuses but strangely enough chronic infection in the prostate and seminal vesicles, the two as a rule being simultaneously involved, if found, is frequently disregarded as a possible site of focal infection. (5) Young states that the condition may "exist for years without producing symptoms or attracting the attention of the patient only to show itself as a danger seat when the patient marries or becomes the subject of chronic rheumatism or other forms of remote infection or toxemia".

In review of the literature one finds very few valuable articles giving exact data on this condition. This is probably the result of the recent new conception of the etiology of the condition. In this paper attention shall be confined to the question of the bacteriology and the role in remote infections of chronic prostatitis and seminal vesiculitis. Its role in the etiology of general nervous and sexual disturbances and local manifestations will not be discussed.

There is a common pathological condition of the prostate that is often considered as chronic prostatitis and it is probably best that the two conditions be differentiated at the start. The condition is that of prostatism, miscalled prostatic hypertrophy. (6) This misconception is the outcome of some writers stating that chronic prostatitis and hypertrophy are essentially the same, all inflammatory in origin and due to gonorrhoea. Although enlarged prostates show inflammation, it is a matter of common knowledge that "prolonged prostatitis destroys by scar so large a proportion of the epithelium as to diminish the prospects that the subsequent gland hyperplasia will ever be sufficient to obstruct urination". (7) In prostatitis there is involvement of any portion of the prostate--infection traveling through the tortuous tubules to the acini resulting in an endo-acinous inflammation or if brought by the hematogenous route, as will be discussed later, a peri-acinous inflammation. At first there is a polymorphonuclear cell infiltration of the stroma and, as the condition becomes chronic, a round-cell infiltration with polymorphonuclear cells in the acini. The process may go on to penetration of the capsule and periprostatic infiltration, which may break through into the rectum or travel into adjacent or remote organs.

Hypertrophy of the prostate consists eventually in distention of the acini with proliferation of the epithelium resulting in the formation of masses of gland which have been aptly described as pseudo-adenomata (the etiology is not known). The proliferation of the epithelium takes place in the submucosal glands, the short glands described in the discussion of the anatomy of the prostate. Consequently the two conditions, prostatitis with the round-cell infiltration and polymorphonuclear cells in the acini caused by bacteria and prostatism essentially a hyperplasia of the epithelial cells of the acini, not a result of



inflammation caused by the invasion of bacteria, as far as pathology is concerned, are in no way related.

(8) The physiological function and location of the prostate are such that it is frequently subjected to a condition, chronic passive congestion, predisposing to inflammation, the frequency of inflammation as stated by Pelouze (9) being 38%--a conservative figure compared with other writer's. Because it is a very delicate and sensitive organ it may be easily upset. This may be brought about by diseases of the rectum, such as hemorrhoids and ulcers; by chronic constipation, by irritating conditions of the urine such as hyperacidity or hyperalkalinity, by excesses with Bacchus and Venus, by excessive coitus, by prolonged sexual excitement without gratification, by masturbation and other unnatural sex acts.

Upon chronic congestion of the prostate, which lowers resistance, infection may be planted from above, from below, from neighboring organs and finally from distant foci through the blood stream. From above there is pyelitis, pyelonephritis, and cystitis. From below there is urethritis. Here arises the question of post-gonorrhoeal prostatitis. From neighboring organs through the lymphatics and blood stream there are the diseases of the rectum. From distant foci through the blood stream, there are the tonsils, teeth, nasopharynx, and gastrointestinal tract to consider. It is even a sequel of constitutional diseases such as measles, mumps, influenza, and typhoid fever.

(10) For many years there has been a rather general impression that the prostate gland only becomes infected in those individuals that have been victims of gonorrhoea. While it is true that a post-gonorrhoeal history is obtained from individuals with chronic prostatitis, it is equally true that a large proportion of prostatic infections have nothing

to do with gonorrhoea past or present. Pus expressed from the prostate was always considered to be either due to gonorrhoea or tuberculosis. (11) In most institutions at the present time chronic prostatitis is accepted as being post-gonorrhoeal in etiology--the sponsors of this theory believing that 40 - 95% of all acute anterior specific urethritis is complicated with prostatitis. Observations have developed a different concept of the etiology. This has been based on four observations: (a) in the first 24 hours of acute gonorrhoeal urethritis streptococcus frequently can be cultured from prostatic and seminal vesicle fluid, (b) treatment of chronic prostatitis is totally ineffective in most cases until system foci of infection are removed, (c) bacteriological studies of several foci often reveal the same microorganism that is found in the infected prostate, (d) 61-65% of the patients studied did not give a history of previous specific infection.

These observations have led to the belief that the accepted theory of the cause of chronic prostatitis--post-gonorrhoeal in origin--explains fewer of the cases than it is supposed to explain and that the instances that the gonococcus invades the prostate are few. A more rational explanation would seem to favor one or both of the two following theories as outlined by A. C. Nickel of the Mayo Clinic, regarding the origin of chronic prostatitis. One of these theories is that the presence of the gonococcus in the urethra stimulates the growth and virulence of non-pathogenic strains of bacteria that are present, invading the prostate through the urethro-prostatic ducts. Along this line Herrold (12) states that "known contributing factors to the virulence of latent bacteria in the prostate are exposures to wet and cold, extreme physical exertion, sexual excesses and other conditions outside of the urino-genitary system." Among these were acute infections, the bacteria coming down through the

urinary tract having been eliminated through the kidneys or the more debilitating diseases that act by lowering the vitality of the mucous membranes lining the glands of the prostate. The other theory is that the infection occurs through the hematogenous route. Pelouze (13) states that the "rather constant association of infection of tonsils, teeth and prostate in the individual is sure to engender the belief that the prostate is secondarily infected by bacteria brought to it by the blood stream. The evidence of failure of adequate urological treatment of chronic prostatitis to improve while other foci of infection, evidently primary, are present and almost spontaneous or, after adequate treatment, the improved condition of the patient following removal of foci, as found by Nickel, is a strong argument in favor of blood-stream infection. Rosanow (14) in his study of foci of infection, giving the results and summary of fourteen years of research found the percentage incidence of associated focal infections very high. A wide range of diseases were studied but of interest here is his work on prostatitis. Of cases reported, having chronic prostatitis:

42% had tonsillitis

54% remote attacks of influenza

63% had tonsils or tonsillar tags

54% had pyorrhea

69% had bad teeth as shown by X-ray.

The same organism, in most instances the green streptococcus, was found in each lesion.

In the study of the gastro-intestinal tract Redewill (15) selected a group of chronic infections of the urinary tract that were particularly resistant to regular methods of urological treatment. In corroboration with other men he found that foci of infection in any part of the body play

a paramount part in the chronicity of urological infections. Ruling out patients who had foci of infection in the head, throat, and chest and as far as possible gall-bladder and appendix, a group of cases--thirteen in all--of chronic prostatitis showing unmistakable evidence of colon stasis with a high count of gram negative anaerobes, an unbalanced count of anaerobes and other putrifactive bacteria, were studied. Therapeutic measures as recognized by gastro-enterologists to correct the colon condition and continued urological treatment cleared up the prostatitis in a comparatively short time. The feature is that for months and even years, when no attention was paid to the colon, these patients responded not at all or very unsatisfactorily to urological treatment alone. He goes on to say that "outside of actually opening up the patients to keep the mesenteric glands under observation and also taking samples of blood at intervals day and night for a period of, say, one week to prove the migration of bacteria from the colon to the blood stream we believe this series of cases is the clearest presumptive scientific evidence reported in the literature of the out pouring of bacteria from the intestine in living human beings to the genito-urinary tract.

What percentage of non-gonorrhoeal genito-urinary infections have a direct etiological factor in the pathological condition of the colon the author was not prepared to say and will not until a larger number of cases are studied.

Von Lachum (16) says that "apparently 40% of chronic prostatitis is hematogenous and that dental and tonsillar infection is responsible for many of these". A comparative bacteriological study of various foci has frequently shown the same strain of bacteria in the prostate.

These statements of recent workers in the field of urology regarding the cause of chronic prostatitis brings out the fact that gonorrhoea

is not the primary cause of the condition and if there is a history of specific infection followed later by prostatitis the role played has been one of preparing the tissue by lowering its vitality. A few general principles may be set down. First, the prostate is a common site of infection, chronic prostatitis having an incidence of 35% in adult males. Second it is not limited to patients with post-gonorrheal history, this explaining very few. There is an abundance of evidence in favor of infection through the blood stream from other foci of infection that are present--that it is secondarily infected and that the same strain of bacteria are found to be present that were present in these foci.

This brings up the question of the dominant flora of the infected prostate. Swineburn (17) in 1917 found the most common bacteria to be the colon bacillus, staphylococcus, and, not infrequently, the streptococcus. Herrold (18) found the most common bacteria, in order of the frequency, to be: staphylococcus albus, streptococcus hemolyticus, the diphtheroid group, streptococcus viridans, staphylococcus aureus, and B. Coli. The recent work of A. C. Nickel (19) is outstanding. The cultural methods of Rosenow that he used in 1924 when working on the problem of foci of infection is attributed as being a big factor in the success of this work. The culture media consists of glucose-brain broth which provides a gradient oxygen tension. Altogether results of 3,500 cultures of prostate glands and vesicles were tabulated; 68% of all cultures were positive. Of the positive cultures 38% contained streptococcus, 20% of these being pure cultures; 54% contained a staphylococcus-like organism; 34% were in pure cultures and 24% contained bacilli, 13% were in pure culture. 9% contained various miscellaneous organisms such as diphtheroids, long chained streptococci bacilli, and unclassified organisms. Thus

streptococci were present in approximately 40% and staphylococci in approximately 50% of the positive cultures.

In order to determine more definitely the nature of the various micro-organisms 200 strains isolated were classified as follows:

Organism	Number of times isolated
Streptococcus pyogens	1
" infrequens	1
" fecalis	29
" mitor	28
" nonhemolyticus i	7
" " " iii	2
Micrococcus ureare	11
" condicans	1
Staphylococcus Albus	40
" tetragenus	8
" epidermidis	6
" aureus	3
Escherichia coli	16
" communur	12

Other forms including the higher bacteria, bacillus subtilis, streptobacilli, diplobacilli, and diphtheroid organisms totaled 35.

(20) The large number of diphtheroids present are often intracellular and closely resemble diplococci. It is possible for them to be mistaken for gonococci. Nogues and DeRupt, as quoted by Pugh (21) claim to have found gonococci in 89% of their cases of chronic prostaticitis. A blow to this assertion, besides the possibility of the intra-cellular diphtheroides being mistaken for gonococci, was that a majority of these

patients were married yet none of their wives developed gonorrhoea. It is hard to accept the findings of these two men and the majority of workers do not.

In the cases in which there was a definite history of gonorrhoea the gonococci were not found. This being true it may be assumed that all types of chronic prostatitis are alike and that it is unnecessary to attempt to differentiate between nongonorrhoeal and postgonorrhoeal. It is also evident that no single organism can be regarded as specific in the production of chronic prostatitis.

Young states (22) "It is now becoming more and more recognized that the etiology of many obscure joint, cardiac, neurologic and other diseases is to be found in chronic infections in remote organs - but the prostate and seminal vesicles have received scant attention". (23) During the last two decades the importance of localized foci of infection has been unwisely emphasized and grossly exaggerated with the results that thousands of normal teeth, tonsils, and appendices have been needlessly sacrificed. Because of the enthusiasm that has prevailed over these above mentioned foci the prostate as a foci of infection has been entirely overlooked. With the knowledge of the relative frequency of metastatic arthritis in gonorrhoea it seems strange that the chronically infected prostate should be overlooked. The general practitioner knows little about urology and in the absence of definite symptoms indicating disease in the genito-urinary system the necessity of a local examination to determine the condition of the prostate is not apparent. Neither is its importance realized. The statement of Swineburn (24) that non-venereal infections of the prostate are almost as common as chronic tonsillitis as a focus of infection in the male will come to be recognized as a fact which has been proven. Beynen (25)

says that when searching for localization of focal infection in the male every male beyond sixteen years must be considered as a potential candidate for prostatitis. No case of focal infection can be said to have had a thorough and proper consideration until the prostate is proven innocent or guilty. However it is not as frequently a focus as are the other potential structures such as teeth, tonsils, and sinuses.

The best proof of causal relationship of circumscribed areas of infection to disease in remote parts of the body is the reproduction of the respective systemic diseases in animals with the bacteria isolated from such foci. (26) The problem of elective localization of bacteria in the animal body embraces an important part of the whole question of virulence and the causation of disease by bacteria. The mere entrance of bacteria into the blood stream is not always sufficient to cause metastatic disease. Quoting Rosenow "certain delicately balanced conditions must be fulfilled in order to promote localization and growth, so that lesions may be produced in different tissues and organs". He does not say whether these certain delicately balanced conditions depend on or a part of bacterial allergy. Small (27) feels that bacterial allergy in its relation to certain phenomena of infection is the important factor and that no matter what organisms are present metastatic infection is dependent upon allergy.

In a more limited sense the term 'elective localization' is used to designate the tendency of certain bacteria, especially the streptococci, obtained from foci and systemic lesions, to localize and produce lesions in animals corresponding to those in the patient from which the micro-organism was isolated originally. The peculiar pleomorphic streptococcus that was found in the diseased prostate by Nickel has been constantly shown to be a common cause of various systemic conditions. It is a green-producing



streptococcus of the fecalis or mitior type. Since these streptococci possess marked localizing properties when isolated from a focus and injected into animals attempts were made to demonstrate a similar property when they were isolated from the chronically infected prostate. (28) If the patient had no systemic complaints there was no tendency to localize in various tissues when injected into animals (the rabbit was used). It was also noted in these cases that a prostatic massage gave prompt relief. This group of cases was put under the head of 'referred pain'. This does not mean that the toxins instead of the bacteria localized in different tissues and set up a reaction but that the pain was either due to pressure or reflex manifestations. When strains taken from patients with systemic complaints were injected into the animal this streptococcus had a marked tendency to localize in tissues of the rabbit which corresponded with the tissues of the patient which were diseased. Frequently the strain injected intra-venously could be isolated from the experimental lesion in pure culture. The percentage of rabbits with lesions of various structures are:

Structure	percentage
Joints	66%
Muscle	50%
Skin	67%
Stomach	75%
Eye	40%
Kidney	65%
Heart	47%

This is convincing clinical and experimental evidence that the prostate is a focus of infection. Yet as in all other cases of remote infection the prostate is not the source of the infection just because it is found to be infected. Owing to the fact that so many patients seem to harbor more than

one source of infection it is impossible to determine accurately the relative importance of each focus.

There is a large class of infections of the prostate that might be called silent infections, that are not associated with any symptoms or signs evident of systemic disease. These are encountered frequently in post-gonorrheal examination for determination of cure or in routine health or premarriage examination. The question arises as to whether they later may become active foci of infection of general system disease of a localized infection. It would be important to know whether the chronic absorption of small quantities of toxic products over a period of a long time might contribute to such remote conditions as nephritis, anemia, circulatory disturbances, or degeneration of any of the organs similar to that known to occur from the continued absorption of other more definite poisons. From the given data there is no evidence that there are symptoms caused by absorption of toxins, if there may be such formed in the chronically infected prostate. All systemic complications caused by the prostate have been shown to be produced only by bacteria with definite localization powers. Judging from clinical evidence as presented by Rosenow (29) localized infection in or around the foci of infection all predispose to disease. He states that the streptococci isolated in studies of various diseases and that have been shown to possess marked elective localization powers are of such low virulence when they exist in the foci that inflammatory reaction of sufficient severity to become manifest clinically should not be expected. This is a point that has not been considered by clinicians. With this in mind the patient with the 'silent infection' should be treated.

By far the most accurate means of diagnosing prostatitis is the microscopic examination of the secretion. (30) The presence of an unusual pus cell means infection. In many cases an increased number of leucocytes

and a corresponding decrease in the lecithen content of the secretion are found in primary examination. It is advantageous, often necessary, to subject the patient to provocative stimulation and repeated examination in order to establish a diagnosis and determine the degree of infection. Cases are graded according to the number of pus cells in the secretion.

Normal secretion		1 to 5	pus cells per H.P.F.				
Secretion with infection	1 plus	5 to 15	"	"	"	"	
"	"	2 "	15 to 50	"	"	"	"
"	"	3 "	50 to 150	"	"	"	"
"	"	4 "	150 and more	"	"	"	"

The presence of small clumps of pus cells is practically always diagnostic.

(31) On rectal examination often the prostate is very little enlarged, and may be quite smooth, but the surface is generally indurated, often variable in character, slight irregularities being present and adhesions to the rectum and lateral walls of the pelvis usually found. In more pronounced cases there may be greater enlargement, sometimes very great, very marked indurations and sometimes softening, fluctuations, and localized focal abscesses, though these are rare.

When a case is referred for examination a good outline, as suggested by Wickham (32), of examination would be to determine: etiological factors--infection of teeth, tonsils, specific urethritis, sexual indiscretions, influenza, trauma; symptoms--sexual, urinary, or general; abnormalities in the urine particularly pyuria; physical characteristic of the prostate, as outlined by Young, and abnormalities in the secretion, as outlined by VonLachum.

The history and physical findings may indicate deviation from the normal and it may be impossible to obtain secretion. The examination under these conditions is indeterminate and probably indicates a latent

form of chronic prostatitis with occlusion of the prostatic ducts. This type is too frequently called negative. The failure of the secretion following massage to become evident is in itself a pathological sign. Under these conditions it is necessary to institute provocation measures--dilatation of the prostatic urethra followed by instillation of silver nitrate. If the results of the provocation are microscopically negative, the condition should further be ruled out by cultural examination. Wickham states that "so called normal, pus free, prostatic secretion shows many virulent strains of organisms when cultered".

The therapy of the infected prostate is as old as it is protean, and the scanning of current literature does not convince us that any specific remedy is either at hand or in the near future. Always it must be kept in mind that the prostate is a racemose gland with comparatively few ducts which empty into the urethra and that these few drain a vast system of smaller and shorter ducts whose numbers increase by more than geometrical progression, as they grow inversely smaller and more difficult to empty.

The question of treatment in some cases has been mentioned. Because there is a correlation of the different foci--teeth, tonsils, sinuses, and the gastro-intestinal tract--and evidence of blood stream infection, many cases will not improve under urological treatment until all foci are cleaned up. There is a problem with the question as to whether the process has been going on so long that there is sufficient pathology in the different systemic lesions for symptoms to continue if the foci are moved. As stated by Rosenow, the type of bacteria causing remote systemic conditions is a low virulent organism giving a slow, insidious onset and development.

If a focus has been proven to contain the causative organism by methods used by Rosenow and Nickel, an improved condition has followed its removal. Autogeneous vaccine has been up for considerable discussion. Rosenow and Struhler (33) noted marked improvement if truly autogeneous, not stock vaccine, prepared from the freshly isolated streptococcus that had localization powers was used.

In review of the recent literature by Hektoen (34) the reports from all parts of the country would seem to give vaccines, both stock and autogeneous, a very low rating. The report shows that this form of therapy is being used by only a small minority of the profession at large and those using it report few satisfactory results.

Keilty (35), following the experience of several years, gained in the preparation and use of autogenous vaccines, is of the same opinion as Rosenow and Struhler. He advises proper preparation and a dosage given that will bring about a maximum reaction, both locally and generally. He states that some of the types of cases in which the best results have been obtained, that is, of interest to us, are focal infections especially of the teeth, tonsils, nasal sinuses, and prostate, with secondary manifestations such as arthritis, myocarditis, anemia and general pains and aches.

It is a mistake to throw all the weight of therapy in a given case on a vaccine. All other measures of therapy should be carried out in conjunction with the vaccine.

With evidence of remote infection, Young (36), supported by Redewill, Allen, Porter, and others, advises intravenous injection of mercurochrome 220 soluble. 5 mgm. of a 1% aqueous solution per kilogram of body weight is given for at least 3 doses over a period of three days. Cases are reported showing marked improvement. M. C. Newton (37) states

that, while mercurochrome 220 soluble in aqueous solution is not a proven curative agent in intravenous therapy against infections, there is ample reason to believe that it is not without merit. He goes on to say "that at least there are no contraindications of note to its usage and probably future work will substantiate the claims of earlier investigators".

Haufman (38) relates that it represents the results of the most painstaking experiments in chemotherapeutics and that, while it has been employed in urology for its local use, its use by the intravenous route has been very largely only as a last resort. Broasch and Bumpus (39) gave the drug 15 times to 9 patients with chronic prostatitis without any appreciable alteration in the disease. Because of its toxicity, they feel that it should be used only if emergency demands. They feel, however, that this type of therapy is still in its infancy and promises well. Because of the mercury, most criticism is aimed at kidney damage.

In time (40) Young found that it could be injected into the blood stream of rabbits in doses up to 10 mgm. per kilogram in the form of a 1% aqueous solution with impunity, and, although slight albuminuria and a few casts were present after such doses, the urine rapidly became normal and no permanent damage resulted. Sacrificed animals that had received 10 mgm/kgm. showed the glomeruli normal throughout, the tubules with a marked swelling of the cells, which, in many cases, practically occluded the lumen and in some places a slight, but definite, loss of epithelium. Subsequent use in human beings demonstrated that the drug could be used with impunity up to 5 mgm/kgm. and repeated several times. Occasionally, at this dose and when doses to 7 and 8 mgm/kgm. were used and repeated, albumen and a few casts appeared, but in all of these cases they disappeared after a few days and no case of permanent renal lesion as a result

of mercurochrome, even in large doses, has been encountered clinically.

If there is evidence of any abscess intra- or extra-prostatic, Fuller (41) and Young (42) advise drainage. Out of 200 cases, Fuller reports that only 5% did not improve and that the one death was due to a complication. Young exposes both prostate and seminal vesicles and proceeds as indicated by the pathology found. After a careful examination to determine whether the prostate is sufficiently abnormal, incision or excision, as required, of the prostate and seminal vesicles is done.

When there is no abscess formation, Hugh Young's (43) treatment is as follows: prostatic massage, but not vigorous emptying should be done first; following, a mild antiseptic is injected by means of a rubber bulb syringe. In this way the drug is forced into the prostatic urethra and absorbed by the empty ducts. Evidence of this is found during the next massage, when the secretion will be found to be stained by the antiseptic. After a period of massage, endoscopic treatment for inflamed areas in the prostatic urethra is instituted. A solution of 20% silver nitrate is sufficient for this. If there are extensive lesions they are treated with a high frequency fulguration current. O. Gant ( ) suggests that rectal diathermy at intervals of 2 to 3 days, the current about 750 - 1500 milliamperes for 20 minutes, proceeding prostatic massage be given. "That heat is communicated to the prostate, no one can doubt who massages the prostate." The patients he has treated in this way start, as a rule, improving after six or seven treatments. Grant feels that diathermy has no specificity other than as a heat producer. After heat dilates the alveoli and small acini and thus promotes drainage, there is no further advantage in using diathermy.

Contra-indications to diathermy are the possibility of burns or injuries to rectal tissue. Extreme care should be used in manipulation.

There is a question of diathermic heat applied to the prostate increasing the likelihood of epididymitis. There is danger of this in the acute forms, but Grant does not think that this can happen in chronic prostatitis. In the presence of chronic sepsis, with involvement of remote organs, the importance of irradiating the focal infection in the prostate is evident when above methods of conservative treatment fail.

In conclusion, I may say that the prostate and seminal vesicles, the two as a rule being simultaneously involved, are frequently the site of a chronic inflammatory process. This condition has in no respect the same etiology or pathology as prostatic hypertrophy and can not result in the condition. Chronic prostatitis is not, in the majority of cases, a sequence of gonorrhoea. It has been proven that men with no history of specific infection have chronically infected prostates. If there is a history of specific infection, its role in the cause of the condition is purely one of lowering the resistance of the organ. Acute specific prostatitis is more or less a self limiting disease and after the first period of acute swelling there follows a gradual reduction in size and a return to normal consistence and shape of the organ. It is during the period of acute congestion that invasion of other bacteria results in chronic prostatitis and not the continuation of the infection by the gonococci.

As for the bacteriology, there is no single organism that may be called specific in the production of the condition and in cases giving a definite history of gonorrhoea there were no gonococci found. It is, therefore, assumed, in the light of the bacteriology of the chronically infected prostate, that there is no need of using the terms "post-gonorrhoeal" or "non-gonorrhoeal", but that all cases are alike.

The prostate may be infected over a period of years before any symptoms of remote infection appear. These symptoms are the result of a



definite type of streptococci having definite localization powers. If isolated from the infected prostate in a patient with symptoms of remote infections and injected into an animal, the bacteria will localize in the same anatomical structures and tissues corresponding to those of the patient and can be isolated again from the experimental lesion in pure culture. These bacteria are as a rule of such low virulence that the pathological process they cause is of a slow, insidious type and in their foci may result in so little local reaction that their presence, on superficial examination, is not suspected. For this reason any male patient over sixteen years of age with symptoms of remote infection should be considered as having an infected prostate until proven otherwise. Authorities in the field of urology feel that the prostate is one of the four major foci of infection. The importance of a rectal examination of the prostate and microscopic examination of prostatic fluid can not be stressed too much.

It is a general consensus of opinion that medical practice and teaching would be decidedly uncomfortable if there was not a theory of focal infection to fall back on in explaining many cases, but that focal infection can cause disease at a distance is an axiom.

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