

# TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY

*Stated Meeting, held December 3, 1917*

The President, DR. CHARLES H. FRAZIER, in the Chair

## OSTEO-ARTHRITIS FROM FOCAL INFECTION

DR. WILLIAM J. MERRILL presented a number of patients to demonstrate the relation between arthritis and tonsillar and dental infections. He prefaced the presentation of these patients by remarking that inflammations arising in joints, muscles, tendons, etc., are due to bacterial infections or intoxications or physiologic poisoning. The tissues in normal conditions, under normal and even abnormal stress, do not undergo any permanent pathological change. If the tone and resistance are diminished and the cells are irritated, slight stress produces morbid change in the parts which are weakest. The effects of traumatism in normal tissues are readily repaired and the tissues return to their normal condition readily, except when there is some constitutional disorder which keeps up the irritation. Arthritis from traumatism readily recovers except when there is a toxic or infectious agent present, under which condition the arthritis may remain subacute or chronic for a considerable time. Even in the case of dislocation or severe traumatism in which there is considerable solution of continuity, when poisons are not present, repair takes place readily. He had seen marked evidence of this fact within the past seven years, in which time mild and severe cases of arthritis have been noted to exist in the presence of focal infection and which have cleared up when the source of poison was eliminated.

Six and a half years ago, a severe case of hypertrophic osteo-arthritis of the hip-joint, in which there were already hyperostoses of the joint and limited motion in the hip-joint, recovered, and nearly normal motion returned after three teeth had been removed and the infection eliminated.

A large number of cases of "sacro-iliac relaxation," "sacro-iliac strain," "sacro-iliac sprain," etc., have recovered when nothing more was done than to treat the focal cause. Many cases of arthritis and localized inflammatory states in the spine are due to physiologic poisoning. From observation of these many cases of pain and tenderness in the spinal and pelvic structures, it has been proven conclusively that when any irritation is continued there is some bacterial or physiologic poisoning to "fan the flame"; furthermore, that in all irritation in a joint or other structure there must be a constitutional toxic state when the condition persists. In cases of mild pain in the sacro-iliac and lumbosacral structures, continued for a long time, and the severe prostrating attacks which might be termed "sacro-iliac crises," the evidence has been in many hundreds of cases very conclusive that the

condition was due primarily, as a predisposing cause, to systemic poisoning, and secondarily, as an exciting cause, to traumatism.

It is not possible to determine from the external appearance of a tooth whether it is infected or not, since many teeth are apparently not devitalized but are in the first stages of the infected condition. The tooth is infected by the invasion of bacteria to the root canal, which may take place by means of erosion through the dentine or enamel, which is chemical dissolution, or by means of abrasion, which is mechanical dissolution. The process of erosion takes place especially in the sulci of the crown and at the neck of the tooth at the junction of the enamel and the pericementum under the margin of the gum. When the dentine is encroached upon, the dental tubuli are opened up and bacteria can pass directly into the tooth. If an abrasion or lesion takes place in the pericementum, then by continuity the infection may travel external to the dentine up to the apex of the tooth and enter the root canal. The formation of tartar underneath the gum is a very frequent cause of erosion. When organic matter is lodged in the margin of the gum, chemical and bacteriochemical action takes place, especially when traumatism is added. Bacterial plaques are formed which adhere to the tooth. Calcification takes place and tartar is formed. Under this tartar, erosion occurs.

When teeth have lost their normal whiteness or have become discolored, they are undoubtedly in the stage of early infection or totally devitalized. Such condition, often when there is no tenderness or pain, should be suspected. The teeth should be X-rayed. When the tooth is devitalized and the abscess involves not only the apex but more or less of the alveolus, it should be extracted. Pivots in the stumps and roots of devitalized teeth, especially when the root canal filling is incomplete, are very frequently sources of infection. Pyorrhœa, especially when it is superficial, does not necessarily cause any constitutional disturbances because, as a rule, under this condition, there is no absorption and the pus which collects and is swallowed is unquestionably neutralized in the stomach.

Focal infections in the tonsils, nasal cavities, sinuses, along the intestinal tracts, such as infected glands, appendix, gall-bladder, in the genito-urinary tract, such as prostatitis, seminal vesiculitis, infected tubes, etc., are unquestionably frequent causes of various forms of arthritis.

DR. WALTER G. ELMER confirmed the statement that infection about a tooth can be disseminated throughout the body and cause serious difficulty. At one time he was himself apparently the victim of faulty dentistry. A week or two after a filling had been removed he began to have pain in the whole upper jawbone, and bore with it as patiently as possible for about three months. As the pain grew steadily worse instead of better he consulted another dentist who drilled through the filling, and about a thimbleful of pus escaped. There was instant relief. It was a front tooth and the pus had evidently burrowed over the upper surface of the hard palate. This is a typical instance in which the local infection may cause serious disturbance elsewhere, as in a joint which had received some slight traumatism.

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On the other hand, a certain amount of conservatism should be used. He related the experience of a friend who, during a visit to another city where great interest and enthusiasm were shown in tooth infection, was persuaded to have X-ray pictures made of his teeth. He was in perfectly good health and, so far as he knew, his teeth were in excellent condition and caused him no trouble whatever. But it was concluded from the X-ray films that he had seven teeth with abscesses at the roots and he was urged to have them extracted at once; otherwise he was marching straight to his doom! However, he demurred, and returned to Philadelphia with all his teeth.

It would be interesting to determine in a series of about 5000 examinations how many gave evidence of certain shadows indicating foci of infection at the roots of the teeth. An inflammatory process in the pericementum at the root of a tooth may subside entirely, leaving behind it only clean healthy tissue, and yet this area will cast a shadow of different density from that one in which there has never been any inflammatory process. Even a circumscribed abscess may become absolutely sterile. It often happens that no culture can be obtained from an old pyosalpinx. And yet such a condition at the root of a tooth would cast its shadow on the film. Children who have had their teeth straightened show changes in the density of the shadows about the roots, but that does not mean infection there because there never has been any infection. It is due to the shift in the position of the root.

A very large proportion of people must have these evidences who are nevertheless enjoying good health. The subject must be viewed in that light and not without caution. Perhaps in the conduct of the orthopædic clinics sufficient attention may not be given to the teeth, but a large number of the joint conditions improve under the usual methods of treatment without having teeth extracted. There are two sides to the question: one in which the matter is overestimated, the other in which the teeth are neglected altogether.

DR. MERRILL, in closing, remarked that patients are always carefully examined in the dispensary. If there is any suspicion of trouble in the mouth, they are sent to the Dental School. Practically 100 per cent. who have been sent to the Dental Clinic have had some mouth lesion. What the percentage of persons not examined in this manner is, it is impossible to state. In regard to ignoring the evidence given by X-ray, it is unquestionably an unwise attitude, even though in certain cases of marked caries of teeth and of the alveolus there is often but little trouble, since the "fires have burned out." Again the X-ray may not show any absorption, erosion or abscess because it is too small to cast a shadow.

In several cases, X-rays have indicated a large amount of erosion and absorption and that the cavities were filled with pus. On extraction there was practically no free pus but infection was present. The associated disabilities which we practically always find act as our guide, and as a rule the affected teeth which are the predisposing cause are extracted.

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A frequent cause of trouble which is not evident on inspection or X-ray examination is a small abscess at the roots of the tooth. The period when the infection is most likely to take place is in the beginning of the formation of this abscess. With these facts in mind, the importance of careful and repeated search is emphasized. If the abscess is not shown by the X-ray taken in a given angle, it should be taken at various angles with a hope of finding the pus cavity. Many times it will be hidden behind the apex of a root and not show. In certain cases referred to, in which there were decided symptoms, such as nerve pain and joint conditions, the abscess at the apex of the extracted tooth was about the size of a pinhead.

The symptoms have subsided in practically every case which was treated at the Dental Hospital, or at least at the present writing, cases which returned to the dispensary have shown improvement or cure. It is, of course, impossible to state the percentage of persons who have apical or alveolar abscess and are apparently in good health.

### SURGERY OF SPASTIC PARALYSIS

DR. A. BRUCE GILL read a paper with the above title, for which see page 529.

DR. GWILYM G. DAVIS said that he thought that the operation on the brain for the localized traumatism resulting in paralyzes did not originate from Doctor Sharpe's suggestion, but rather from Cushing's. He had been over the same material mentioned by Doctor Gill in reference to the examination of the eyeground. Cerebral decompression is obviously a measure intended to lessen the pressure inside the skull, and one of the symptoms of such pressure is clouding of the optic nerve as observed by the ophthalmoscope and that is what one universally fails to find. A child with spastic paralysis, even at the age of two years, does not have the use of the limbs which it should have at that period. The condition is called cerebral spastic paralysis and is often associated with an impaired mentality. Some of the evidences of that are very obscure and interesting. In the treatment of the cases, the old method of tenotomy still continues largely in force for two reasons: (1) the ease of its performance, its availability, and (2) because at times the results which it yields apparently compare favorably with those of other methods. He was not willing to go quite so far as does Doctor Gill in the advocacy of the Stoeffel operation, for his experience with it has not been so entirely favorable as his. He had not found it always an easy operation, being considerably more difficult than the tenotomies. He, too, had done it on two sides, but the difference has not been so great as to incline him on all occasions to prefer it to the tenotomy. It should be emphasized that by tenotomies and transplanting the condition in many of the cases can be improved. Doctor Nutt, of New York, some years ago divided the sciatic nerve deliberately, paralyzing the limb. He noticed considerable improvement in his patient, both in the parts affected and in the intelligence of the child. Encouraged by his results Doctor Davis divided the median nerve in

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the case of a young woman of eighteen years with contracted arm. She improved to such an extent that she later wanted the nerve divided a second time. Arrangements were made to do this but the patient's husband objected and the operation was not done. The Stoeffel operation would be followed by considerable improvement. He did not wish to appear antagonistic to this operative procedure because he believed it to be a good one. There are cases, however, such as children who rise a little too much on the toes when they walk or run, in which cure is effected by simple tenotomy and without the necessity of the more elaborate operative procedure. Yet there is a field for the Stoeffel operation.

DR. CHARLES H. FRAZIER remarked, with reference to resection of the posterior roots for the treatment of spasticity, there is no doubt that the operation is a very serious one and that the mortality is relatively high; there is no doubt also that there has been a considerable number of failures. It is easier to give the contra-indications for the operation than to give the indications. Certainly the operation should not be done in subjects not physically strong, in delicate children, nor in feeble adults. It should not be done for spasticity in the upper extremities. It should not be done when there is lacking good muscular reserve power, for when the spasticity is relieved, the function restored in the way of locomotion will not be sufficient to have warranted an operation of that gravity. It should not be done in children who are mentally defective, because the after-treatment is essential, no matter what the operation be, and unless the surgeon is assured of coöperation on the part of the patient the results will not only not be good but in most instances a failure.

Now with regard to the technic of the operation, he emphasized the point, that in the early stages there were many failures because too few roots were cut. For complete and reliable statements of what can be done by this operation he referred to Förster's own writings. He has done more root resections for spasticity than any other surgeon, and has been more painstaking in the follow-up treatment. The end-results depend upon the care in the selection of the roots to be cut and the persistence of the after-treatment. Förster's articles are profusely illustrated and afford an excellent demonstration of what can be accomplished.

The operation itself is attended with a risk greater than that of the ordinary laminectomy because one is dealing chiefly with large bundles of sensory roots and any insult to these must be a predisposing factor in the causation of shock or collapse. He had found that by the application to the cord and roots at the level of operation of a cotton pledget, saturated with a 0.4 stovain solution, shock could be eliminated. This is a simple procedure and it seems entirely rational. As a matter of fact he had proven by pulse and blood-pressure tracings its efficiency in the experimental laboratory.

Another point of great moment in the technic is the question of post-operative bleeding. A small artery accompanies each root and if we are

content with the mere section of the root with knife or scissors there will always be more or less postoperative oozing. A very little blood inside the dural sac will result in the formation of adhesions. Absolute hæmostasis is essential to the ideal operation. This can be applied with reference to root resection by ligation; in fact, he had done some of these operations without cutting the roots at all. With the finest silk suture he simply tied the ligature around the root. The root must undergo degeneration; regeneration cannot take place in the root any more than it can in the spinal cord or brain. By applying two ligatures and dividing the root between, the operation can also be made bloodless.

Theoretically, the operation is based upon sound physiological principles, but the technic is too difficult to warrant one's recommending it except to the neurological surgeon. Its successful performance requires great technical skill and dexterity and the mastery of many important manœuvres with which only those accustomed to the surgery of the central nervous system are familiar. With these restrictions he earnestly endorsed the operation in selected cases, and had practised it a number of times in his clinic.

From what Doctor Gill has said and from his own knowledge of the subject there is no doubt that the Stoeffel operation has a very much wider application. The principle of the Stoeffel operation is fascinating. His first experience with it was in the laboratory. In trying to devise an operation for the relief of deltoid paralysis, one of the most common sequelæ of infantile palsy and particularly deforming and undesirable in young women, it occurred to him that it might be possible and feasible to sacrifice a portion of the function of the triceps muscle for the benefit of the deltoid, using for this purpose a portion of the musculospiral nerve, representing the innervation of the triceps muscle. Extremely painstaking dissections were made in the cadavers of monkeys, newborn infants, and adults. With these he was able to confirm the observations of Stoeffel and at the same time familiarize himself with the topographical anatomy of the musculospiral nerves. In two monkeys he carried out an end-to-end anastomosis of the intentionally cut circumflex nerve with the electrically isolated portion of the musculospiral nerve. (In the monkey this represents approximately the posterior third of this nerve.) Immediately after the operation there seemed to be a complete musculospiral palsy with wrist-drop and inability to abduct the upper extremity. At the end of five months the wrist drop had disappeared and movements of the upper extremity were quite unrestrained. This was his first experience with the Stoeffel principle and it was sufficiently positive to convince him of its physiological soundness and the practicability of its application. So far as the effect of cerebral decompression is concerned in the treatment of spasticity he said that in the beginning he viewed the proposition with absolute skepticism and that nothing he had heard since had led him to change his views.

#### MASSIVE DEGENERATION OF THE KIDNEY AND ITS RÔLE IN THE CLINICAL CURE OF RENAL TUBERCULOSIS

DR. ALEXANDER RANDALL read a paper with the above title.