

tients. Cancer of the stomach too often begins away from the pylorus and becomes extensive before encroaching upon its lumen.

Chemistry and the microscope applied in an examination of the gastric contents may or may not be of value. We have learned not to expect too much from gastric chemistry, and we probably have not always made good use of the microscope. I recall one case in which the diagnosis was established by a microscopic examination of the residue from the stomach contents. The diagnosis had been in doubt for several months. Dr. Macrae made vigorous massage in the region of the epigastrium; then searched for tumor cells and found them, yet the condition was then inoperable. Blood, leucocytes, sarcini and tumor cells are not always to be found in early cases, and like free HCl, their presence or absence may be common to malignant or benign stenosis. A bismuth picture or the fluoroscope may or may not demonstrate an early neoplasm. The x-ray will occasionally indicate the presence of a tumor which cannot be felt, but very rarely will it reveal the presence of a very small growth or one which has not produced fairly typical symptoms. At present the x-ray is of value but its function is mainly confirmatory. Meanwhile, the personal history, more important in cancer of the stomach than in any other region, must furnish the evidence for or against exploratory laparotomy.

The cancer age, progressive loss of weight with loss of appetite and impaired digestion, pallor with an expression of impending trouble, especially following upon a history of ulcer, even in the absence of a palpable tumor, chemistry or x-ray proof, should be sufficient evidence upon which to expose the stomach for direct examination.

In private practice I have made it a rule to charge little more than an examination fee for opening the abdomen only, and I believe that this consideration is expected, and if always exercised would remove one objection to this procedure.

Exploratory laparotomy, however, has other inconveniences and will probably never be submitted to with any more equanimity than it has already. The strongest arguments in its favor are: first, that exploratory laparotomy is the only known method for the early diagnosis of most cases of gastric cancer while in the curable stage; and secondly, that this disease if not removed, always terminates fatally.

Until recently the operation usually employed as a palliative measure was gastro-enterostomy, and rarely gastrostomy. Neither of these operations has ever been found to afford much relief and now, with the risk of a much higher mortality, surgeons generally are advocating removal of the tumor mass plus the anastomosis. The presence of a large bleeding and sloughing surface in the stomach makes a sad picture, even with a gastro-enterostomy. Palliative surgery for cancer of the stomach has

a place, but it is not large. The decision in favor of extreme measures, as they usually should be, involves not only a keen sense of discrimination but exceptional operative ability as well.

The radical operation for cancer of the stomach consists of partial gastrectomy and gastro-enterostomy. The same principles of technic should apply here as for an operation for cancer in other regions. Wide margins of healthy tissue should be included. A complete excision of the lymphatic zones draining the infected area should be made. The presence of enlarged glands in the immediate vicinity of the tumor does not always indicate metastasis, and should not influence the surgeon to abandon the situation as inoperable. Not infrequently these glands are found to be merely inflammatory and free from cancer cells. Visceral metastasis or involvement of the peritoneum with ascites are contraindications to any operation.

The mortality from excision and anastomosis, according to the Mayos' statistics, is about 10%. A patient has 36% chances of living three years and 25% chances of living five years. These figures are the result of an analysis of their cases, which could be traced, and undoubtedly include many bad risks. They are convincing, stimulating and indicate even greater possibilities.

SOME RELATIONSHIPS BETWEEN ORTHOPEDIC SURGERY AND INTERNAL MEDICINE.

BY H. W. MARSHALL, M.D., BOSTON.

In treatment of joint conditions orthopedists must study causes that act to produce pathological changes as well as correct existing articular defects by surgical operations and mechanical appliances.

And it is the task of orthopedists even more than of medical internists to pick out from the large mass of data pertaining to internal medicine such bits of knowledge as have bearing upon health and disease of joints.

The fact that the former accept responsibilities of directing treatments of patients as well as acting as consultants, makes their attitude an important one toward medical procedures which often are necessarily involved. And such questions as the following arise,—Shall patients be subjected to operations and to wearing corrective or supportive apparatus with only casual attention being paid to the vascular conditions among which are found the primary causes so frequently for articular disturbances?

It is perfectly true that patients can recover completely, although very little attention is paid in some instances to anything except surgical

and mechanical features; but does this justify some orthopedists in ignoring other etiological factors, or should they discover and treat the latter as carefully as they do gross anatomic defects, and in all possible ways increase the number of persons who are relieved?

The writer takes the position that all special branches of medicine, orthopedic surgery included, must preserve their proper relations with internal medicine; and that patients must not be treated as collections of unrelated special organs, but as groups which are combined always into single physiological entities. Each special organ is subjected to many influences in common with all others, and these common features, which belong to internal medicine, must be given equal notice with the particular peculiarities of the different parts.

Orthopedists who simply are good anatomists, surgeons and mechanics, and who do not attempt to understand thoroughly the very important principles of internal medicine relating to orthopedic subjects, should not expect to relieve as many patients as those who combine all points of view.

Causes for abnormal joint functions may be grouped roughly into classes of: (1) congenital abnormalities; (2) nervous disturbances, paralytic and spastic deformities, which result in loss of the use of joints; (3) traumata and external physical agencies acting upon joints; (4) harmful mechanical strains and pressures due to body weight and body movements; (5) neoplasms; and (6) vascular conditions producing arthritis.

In mentioning lesions the term arthritic will be used for convenience rather loosely in what follows to designate various hypertrophic, atrophic, degenerative, inflammatory changes, etc., while the last named class, arthritis of vascular origin, is discussed.

Internal medicine and orthopedic surgery meet on common grounds when certain constituents of the blood are considered. These are circulating waste products from tissue metabolism and from intestinal bacterial activities, all pathogenic bacteria and their toxins in the blood stream which produce arthritis, and other occasional constituents which at times provoke harmful joint changes.

Orthopedists need to keep in mind clearly various facts and theories, many of which belong as much to internal medicine as orthopedic surgery, that are concerned with conceptions of causes of joint diseases in general, and of individual cases in particular, because therapeutic measures vary within such wide limits as the result of variations in conceptions. Causes are either direct or contributing ones.

Direct exciting causes for local pathological changes in joints are comparatively few. Foremost among them are mechanical strains and irritations from body weight and from motions of different members of the body, and also from mechanical origins resulting from traumata.

In the blood the only substances that can be reasonably suspected of producing harmful local articular effects are urates, calcium salts, waste products of harmless intestinal bacteria, various pathogenic bacteria or their toxins, and lead. To this number should be added the cause of atrophic arthritis which the writer has suggested probably is another normal waste product, creatinin. Articular changes are caused directly by deficiencies presumably of specific substances in rhachitis and scorbutus.

These various direct effects may be grouped in another way under (1) mechanical ones; (2) those due to foreign substances introduced occasionally into the circulation,—pathogenic organisms, their toxins and metallic poisons; and (3) those caused by normal constituents of the blood which produce harmful changes from being retained in circulation in abnormal concentrations. In this third division are placed gout associated with urates, hypertrophic arthritis showing the direct effects of calcium salts, intestinal toxemic arthritis due perhaps to circulating indoxylsulphuric acid, and atrophic arthritis which may be caused by creatinin retention.

In contradistinction to direct origins must be mentioned many predisposing conditions and contributing causes. These are very numerous and varied,—for example, large amounts of fat deposited beneath synovial structures tend to make such joints more susceptible to harmful developments after traumata or infections by subsequent swellings and pinchings in normal joint motions.

Long continued exposures to great extremes of temperature may lower vital resistances of articulations and permit vascular causes to act which otherwise would be successfully resisted. Initially low congenital joint resistances must be thought of as contributing to some pathological developments.

Among the group of pathological articular changes, which are produced by abnormal quantities of normal vascular constituents, there may be many contributing factors which help to vary vascular proportions of the specific vascular irritants. These include kidney defects, abnormalities in liver function, irregularities of tissue metabolism, unusual bacterial fermentations in the digestive canal, lack of normal nervous control of various organs which lead to their improper functioning, abnormalities in blood pressures,—in fact defects among any of the physiological absorptions, eliminations, conversions in the tissues, enzyme activities, etc., concerned with maintenance of normal vascular proportions of the substances which act directly upon the joints.

Finally, among contributing causes must be mentioned influences upon joint tissue cells themselves of previous bacterial infections, and of other abnormal quantitative vascular irregularities, whereby articular resistances are lowered so that specific latent causes, which are always present, exert their characteristic harmful

effects. The healthy balance between the two is upset in this last instance by changes in articular tissues instead of changes in external causes acting upon them.

From the great number and kinds of contributing causes it is extremely probable that the prevailing confusion arises which exists regarding the nature and origin of joint diseases. And metabolic, infectious and neuropathic theories that have been urged for various types of articular lesions, it seems all may have at times more or less truth in their conceptions.

The writer believes, however, that it is very important to differentiate distinctly between direct and remote origins for joint lesions, and to restrict clinical classifications to specific harmful chemical and mechanical influences, which produce effects directly upon protoplasms of joint tissue cells with development of pathological changes in them. Let it be repeated that direct irritations of articulations are produced through external physical agencies, mechanical irritations, products from pathogenic bacteria, lead, urates, calcium, products from harmless intestinal bacteria, and another waste product of tissue metabolism that is eliminated by the kidneys, which perhaps is creatinin.

If this conception of arthritis is accepted then there will be no objection to the various other theories that have been proposed, and that are based upon occasional marked defects in other organs which contribute to developments in ways that have been indicated.

How far orthopedists shall go personally into matters of regulating diets, excretory functions, blood pressures and other physiological processes concerned in maintenance of normal vascular conditions is open to wide discussion. It seems at least, that they should appreciate thoroughly that these various factors enter very frequently into orthopedic situations, and that medical features often determine ultimate successes and failures when orthopedic treatments are surgically and mechanically perfect.

The writer is impressed more and more with the importance of intestinal putrefactions as primary causes of joint lesions; also it is his belief that many typical gouty, hypertrophic and atrophic types in their exacerbations and recurrences have important intestinal toxemic elements in each frequently, which are entirely overlooked and attributed to the other obvious specific causes that are producing characteristic pathological changes.

It seems of the utmost importance to realize that the gastro-enteric tract is contributing ordinarily harmless bacterial products constantly to the blood, and that these are capable of setting up joint irritations under favorable circumstances. Owing to the great frequency of intestinal fermentations and putrefactions and their bearing upon orthopedic conditions it seems also that orthopedists should know how to treat skilfully, as well as recognize, these medical conditions. For undoubtedly they are causes of many

chronic, mildly debilitated, anemic states that are accompanied by orthopedic complications, such as relaxed pronated feet, postural defects, sagging viscera, hollow backs, drooping shoulders, shifting muscular and articular pains about hips, knees, shoulders, elbows, scapulae and various joints, sacro-iliac relaxations, etc., as well as the more severe lesions, the multiple peri-articular swellings and synovial accumulations seen in chronic progressive cases.

Careful weighing of the evidence at hand indicates that infectious foci due to streptococci, staphylococci, gonococci, etc., will not satisfactorily account for toxemias commonly accompanying run-down anemic states. Such foci very often cannot be demonstrated in them, nor is there any reason to suppose foci exist; and, furthermore, efficient regulations alone of digestive and eliminative functions quickly restore health when harmful concentrations in circulation of ordinarily harmless intestinal bacterial products are reduced.

The question arises, when it is realized that the blood always contains several substances capable of producing characteristic joint changes, why stop at intestinal toxemic arthritis, and why not insist that orthopedists also should know more about gout, atrophic and hypertrophic types, and the possibilities of regulations of diets and eliminative functions in treatments of these diseases.

It is certain at least that occasional medical consultations, of orthopedists who are managing treatments, are not productive of best results in these matters which require constant supervision from day to day; and it seems that orthopedists will gain greatly, through increasing their appreciation of internal medical features, and by closer co-operation with skilful medical internists.

And the latter will appreciate also much more fully why many of their own patients, although treated with perfect medical attention, continue to have articular weaknesses and defective attitudes because of failures in applying mechanical supports at the times symptoms were at their height, when ligaments were non-resistant.

Vaccine treatments, hydrotherapy, massage, medico-gymnastics and other physical therapeutic methods come to mind as being frequently used by orthopedists. They are getting to be important branches of medicine that are approaching the dignity of specialties like cardiac, renal, and gastro-enteric diseases.

They will not be discussed, however, and are mentioned mainly to emphasize the point that future developments of orthopedics seem likely to advance along medical lines as much as upon strictly mechanical and surgical ones, working forward to embrace more and more important physiological, biological, bacteriological and chemical considerations as well as gross structural ones.