For those patients who judge the merits of an operation by the appearance of the scar, this incision is particularly desirable; the part which is not hidden by the pubic hair follows the natural skin lines and will eventually merge with these lines.

I have information concerning approximately one hundred of these operations that have been performed by surgeons in different parts of the country, and the results have been eminently satisfactory.

The question of how calamitous infection would be has naturally been raised. To my knowledge, there have been three infections to date; they were all limited to the subcutaneous fat, and cleared up promptly. In view of greater vascularity of this region, one may expect a lower incidence of infection here than in other locations in the abdomen.

Until we gain more information from inadvertent infections, the use of this incision is not advocated for patients in whom infection would be a likely complication. In abdominoperineal resections and other pelvic procedures with potential contamination of the wound, local use of sulfanilamide in the properitoneal, and particularly in the subcutaneous fat, is advisable.

SUMMARY

A new transverse low abdominal incision is described which has advantages in all the stages of the operative treatment. During the operation, it affords better exposure with lighter anesthesia. During the early postoperative days, it makes for greater comfort by decreasing abdominal distention and decreasing pain on deep respiration, coughing, sneezing, and moving; the incidence of pulmonary complications is, consequently, less. Ultimately, as well as immediately, the wound is strong because no muscle is denervated, the incision is staggered, all the sutures are taken in aponeurosis or tendon, and the direction of the main muscle pull is parallel to the direction of the incision; these factors should practically eliminate dehiscence of the wound in the early days, or development of a postoperative hernia subsequently. The good cosmetic result appeals to the patient as much as the other features do to the surgeon.

490 Post Street.

TROPICAL DISEASES*

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ONE of the finest chapters in the history of the United States Naval Medical Corps is being written today by the extraordinarily competent handling of the tropical disease situation by the men in the advanced units. The hospitals on the West Coast are greatly indebted to these men for their brilliant and sometimes inspired clinical reports.

MALARIA

Malaria is, of course, numerically our greatest problem, and its therapy continues to be not entirely satisfactory. A new departure in therapy first used by Lieutenant Kennedy at the Letterman Hospital is very promising. We have used several forms and combinations of therapy. The form that to date has given us the smallest number of recurrences is a combination of larger doses of atabrine, standard doses of quinine combined with the use of adrenalin and ephedrine. Our use of intramuscular doses of atabrine to secure an initial high blood level and maintenance of that level by continued oral use is insufficient, both as to number and length of time, to permit any conclusion. The intravenous route for quinine administration has achieved brilliant results for us in cerebral, and some of the other atypical malarias seen in our hospital. In our experience 90 per cent of the cases have been benign tertian, 6 per cent malignant tertian.

The clinical manifestations and immunological reactions have given some indication that the benign tertian being seen today may be a separate type from the usual strain that has been seen. Further work is now being done by Dr. Paul Michael on this problem. We have one case, a man who had been on Samoa only. This is the only case reported from this area.

INTESTINAL PARASITISM

Intestinal parasitism, though showing a high total number of cases, is not alarming when considered on a census percentage basis; as a matter of fact being almost within the same percentage limits as seen in this country. The slide shows the percentage observed to date in our hospital. Fourteen per cent of examined stools showed pathogenic forms. They have not been a serious problem.

PARAGONIMIASIS

Paragonimiasis, a rather unusual disease, was detected in our armed forces by Dr. John J. Miller, Jr. This disease has also been known as pulmonary distomiasis and endemic hemoptysis. Both of these names are open to criticism as being misleading. The infection may be found in any organ of the body, is not necessarily characterized by pulmonary involvement, and hemoptysis need not be present, though the lungs are involved. It is seen commonly in Japan, Korea, Formosa and in many isolated Far Eastern foci, including the Philippines and, with the advent of this war, Samoa.

Ova are expectorated or passed in the feces of infected man or animal, mature and hatch in water, liberating a miricidium. This penetrates the soft parts of a snail, develops into a cercaria, or the second generation form. These cercaria penetrate the chitin of the crayfish, cause a generalized infection and become encysted. These encysted forms, if eaten by man, either raw or improperly cooked, penetrate the intestinal wall, migrate through the diaphragm to the lungs, and from there to any part of the body. Some of the young worms may not penetrate the diaphragm. They have been found fully grown in the peritoneal cavity. Direct infec-

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The opinions or assertions contained therein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

tion has been accomplished experimentally without the miricidium passing through snails and crayfish. This raises the question of the possibility of natural, direct infection occurring from the consumption of poorly prepared parts of infected animals.

Musgrave, in describing the pathology, demonstrated the flukes and ova in the lungs, pleural and peritoneal cavities, the heart, pericardium, liver, pectoral muscles, intestinal wall, the deep and superficial lymphatics, appendix, meninges and choroid plexus. He concluded that this general distribution was accomplished through the blood stream and lymph channels. He described nonsuppurative, suppurative and tubercle-like lesions.

Paragonimiasis, though generally chronic, may have a fulminating, rapidly fatal course, especially if complicated by a preëxisting disease such as tuberculosis.

The *symptomatology,* usually first presented, is referable to either the chest or abdomen, or due to lymphatic involvement. When the chest is involved, it is usually characterized by a chronic, productive cough; the sputum being thick, spotted with brownish flecks and frequently streaked with blood. One of our patients gave a *history* of repeated massive hemorrhage necessitating transfusion; this had not been previously described. Frequent, almost constant, pleural pain is the rule.

Physical findings vary, but most frequently resemble those of bronchitis. The ova found in the sputum are described as thin-walled, doubly refractile eggs measuring from 62 to 98 mu. They contain an operculum and a dark nucleus, surrounded by golden brown yolk cells. Fever varies with the course of the disease. A leucocytosis, with or without an eosinophilia, may or may not be present. In the abdominal type there is usually a dull generalized pain and tenderness with some rigidity. Not infrequently there is an increased area of liver dullness due to the presence of the fluke in the biliary passages. Bloody diarrhea is frequent. Psoas abscess resembling the tuberculous has been described. In the lymphatic type, local symptoms due to a lymphatic hypertension caused by either a partial or complete regional obstruction may occasion biopsy as means of differentiation from filariasis.

There is no specific *therapy.* Sulfonamides are used for contaminating organisms. Phenodiazine has been used, but the results are not encouraging.

FILARIASIS

The most interesting of all the tropical diseases seen by us has been filariasis, caused by the Filaria or Wuchereria bancrofti. This organism has a wide distribution in the tropical and subtropical regions of Africa, India, China, Australia, South Pacific islands, certain parts of South America, the Caribbean Islands, and in Charleston, South Carolina. The adult females average 60 mm. in length, the male 30 mm., while the microfilaria range from 150 to 300 micra in length and 7 micra in diameter.

Under well-controlled conditions forty-four different mosquitoes may serve as partial or complete hosts for the development of the mature larvae. Practically, however, the Culex Quinquefasiatus, Aedes Variegatus, and the Culex Pipiens account for the vast majority of intermediary hosts. The microfilariae, injected by the mosquito, undergoes three metamorphic changes, migrates to the labellum, and as the adult larvae can then cause the infection. After the bite, the larvae, being lymphotactic, enter the skin and lymphatics, and are carried to the deeper lymphatics, where they develop into the mature worm, mate, and parturate.

The *clinical picture* seen in these cases is that of a subacute lymphangitis, recurrent, linear, elevated, hyperemic, and at times very painful. It proceeds peripherally, leaving during the stages of remissions some distinct induration of the lymphatic channels, with enlargement of the lymph nodes. It may involve one or both upper extremities, one or both lower extremities, and in a certain percentage, the spermatic cords and testicles. Combinations of these may occur in the same patient.

Classically, this infection is supposed to be divided into four phases, namely: the incubation period; the second, or symptom-free period; next the lymphangitic phase; and, finally, the chronic stage of Elephantiasis. We have observed the first three phases, but not the classical elephantoid phase. To date, no microfilariae have been seen in the peripheral blood.

Thirty per cent have been proved out by biopsy studies with the demonstration of the adult or adolescent worm, both male and female. The remainder of biopsies, although not actually showing the worm, were presumptive, in that the classical granulomatous lesion of this disease was observed, with typical granulation tissue and eosinophilic infiltration. The symptoms seen in the lymphangitis stage are probably due both to mechanical blocking by filariae, together with an allergic reaction between the human host and the products of the worm. Culturally, our cases were sterile except in one instance, where the lesion was superficial and communicated with the outside skin.

It is felt that these patients will be cured spontaneously simply by foreign-body engulfing of the worms as a natural course of body resistance. Relapses, of course, will follow before this cure will be effected. There is as yet no specific therapeutic agent known, although most drugs have been tried. It had been our reaction that surgical removal of superficial foci has resulted in improvement of the patient. Surgical intervention of the spermatic cord lesions, however, is strongly advised against, as lesions of this nature usually undergo exacerbations after this procedure.

Discussion.—The laboratory diagnosis of endemic filariasis in the natives, as seen in Samoa and other islands of the South Pacific, usually offers little problem. The finding of the microfilaria of filariae bancrofti in the blood is a most usual event in large numbers of the natives of these islands. The incubational period of approximately eight months to one year from the time of infection to the appearance of the microfilaria in the blood, however, renders the proof of infection in the military

personnel a somewhat more difficult problem. The differential diagnosis, from the clinical point of view, is obviously fraught with many complexities. Atypical Malaria brucellosis may simulate Filariasis. Moreover, the finding by the laboratory aides of Paragonimus ringeri in several patients returned from Samoa, discloses another disease which may simulate Filariasis in its early forms. As a matter of fact, these diseases may even exist simultaneously in the same patient. Therefore, every possible laboratory aid to the diagnosis of filariasis must be brought into use. Space does not permit the various tests which may be used in the diagnosis or ruling out of such allied conditions as are named above, except that it should be born in mind that Paragonimus ringeri, or P. westermanii, may lodge in the lymphatics of the extremities or spermatic cord, and in doing diopsies, care should be used in not overlooking any possible presence of ova. Stool and sputum examinations in this condition are also of great aid.

In approaching the *diagnosis* of Filariasis in men who have been in endemic localities, the time interval is of first importance. It is unlikely that microfilaria will be seen in the blood or hydrocele fluid of men with incubation periods of less than eight months to a year. Search should be made, however, even in doubtful cases. Ordinary blood smears, preferably around eleven o'clock at night, should be made, using thick smears. The concentration technique of Knott, however, may be used both in day and night examinations. This technique employs the use of 1 c.c. of blood in 10 c.c. of 2 per cent formalin. This is allowed to sediment for from twelve to twenty-four hours, and the sediment used for thick smear preparations. Giemsa, Wright's or Loeffler's methylene blue-eosin stains may be used. Unfortunately, this rather simple diagnostic method is of little help in the patients who may be in the incubational asymptomatic, or early acute stages before the worms have become sufficiently mature to produce microfilaria.

In the lymphangitic stage the most valuable aid is the removal of tissue for biopsy examination. Certain important points in this procedure should be followed, namely, choice of site for biopsy, and the use of serial sections, if single sections fail to reveal the adult or adolescent worms. As the worms apparently seem to follow a retrograde movement distally in the lymphatic chains, the choice site of the biopsy should, if possible, be the most distal lymphatic involvement. Biopsy of the cord-like structure is more desirable than the lymph node itself, as lymph nodes may show only a drainage type hyperplasia with eosinophile infiltration and edema. There is a rather characteristic granulation tissue produced by the lodgment of the worms in the lymphatic or other soft tissues. A tuberculoid reaction is observed around the engulfed worms, many of which may be in the process of death or absorption. In identifying the mature or adolescent worms, care should be observed in recognizing certain aspects of the morphological characteristics. The cuticle of Wucheria bancrofti is smooth, the spicules are unequal, and in the female the uterus is double on cut section. The vulva of the female is preëquatorial, usually in the esophageal region. The posterior end of the male is sharp, with a ventrad curve, while in the female it is blunt. If a suitable biopsy is taken from the soft tissue lesions, little difficulty should be encountered in establishing the diagnosis.

Other tests, now not commonly used, but of distinct help, are the alexin-fixation and the intracutaneous reactions. Alcoholic and aqueous antigens derived from fresh or dried Dirofilaria immitis and Onchocerca vuloulus.

There is no specific treatment. Local measures, as wet packs, elevation, etc., are used for the relief of the acute lymphangitis. Surgery is resorted to in the elephantitic stage.

A typical report from the department of pathology is as follows:

Microscopic.—The microscopic sections show lymphatic tissue undergoing endothelial and fibrous hyperplasia. Several dilated lymphatic channels can be seen containing adult filarial segments, many of which are undergoing early calcification. The endothelial cells proliferate radially from the channels, and the nuclei of the cells nearest the hub show pyknosis. This reaction causes a picture simulating palisading with formation of pseudorosettes. In same places the fibrous tissue is young and immature, composed of proliferated fibroblasts, while in the others it is old, homogeneous, hyalinized. Round cells are numerous and extend out into the fat and muscle. Endothelial cells occasionally are fused and show pseudo-giant cell formation. Eosinophiles are numerous and in many places the eosinophilic granules have broken out of the cell membranes, but may be seen scattered as fine, red, dust-like particles between the cells. There appears to be some attempt to collateral lymph circulation.

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VIRUS PNEUMONIA: A REVIEW OF THE PATHOLOGY*

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SECONDARY bronchopneumonia is of fairly frequent occurrence, but primary bronchopneumonia, except in pandemics of influenza or streptococcal epidemics, is rather rare. However, in recent years there has been a growing number of reports of pulmonary disease of undetermined origin. In 1935, Bowen [1] called attention to a form of pneumonitis observed in troops in Hawaii which produced but few clinical signs except for râles, and was mild, but x-ray showed spotty shadows extending into the lower lobes. Cough and low leukocyte counts were characteristic. Cultures from the

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