Observations on Paragonomiasis at the Quezon Institute*

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The purpose of this paper is to present a review of the paragonimus cases seen at the Quezon Institute for the last five years. These cases the authors consider fairly representative of patients with lung fluke manifestations in the Philippines.

Paragonomiasis is sometimes called “Endemic Hemoptysis” because after a violent exertion or sometimes even without it attacks of hemoptysis of varying degree of severity occur. In 1877 this disease first became known to medical science. When a lung fluke was found in a tiger which died in the zoological garden at Amsterdam, Holland. The director, Westerman sent the specimen to Kerbert who, unable to identify it, named the species Distoma westernmai. In 1879, a Portuguese in Tansui, Formosa, was found to have lung fluke when he died, and the specimen was forthwith sent to Manson who in turn forwarded it to Cobbold who named it Distoma ringeri. It was Leuchart (1899) however, who gave the lung fluke such a masterly description that subsequent observers have been unable to add to it or even modify it. It was he who established the fact that the material from both the tiger and the man belong to the same species. In 1899 Brown established the genus Paragonimius to include these parasites. Since that time various reports have been published wherein the parasites have been found in both man and animals and in different organs such as the brain, lung, scrotum, orbit, pleural cavity and mesentery. Ward and Hirsh by 1915 were able to establish three species of mammalian fluke, calling the tiger form Paragonimus westermai; the human form Paragonimus ringeri; and the forms found in dogs, cats and pigs, Paragonimus hellicotti. Since there was not sufficient grounds to justify separation of the lung fluke found in the tiger from that of man, the older name, Paragonimus westermai finally prevailed and up to the present has been considered as the representative species.

The disease caused by this fluke is considered a medical rarity

being present only in places where suitable intermediary hosts are found. Insofar as our own country, the Philippines, is concerned, two places stand out as endemic regions, namely, Samar and Leyte, the latter place being identified in the American mind as the spot where McArthur's forces of liberation first landed when they returned as promised to roll back the armies of Yamashita et al. All the patients presented in this review came from Leyte. They were all admitted as emergency bleeding cases.

Life Cycle

To better appreciate the difficulty of differentiating paragonimiasis from pulmonary tuberculosis from the purely clinical side, a fair knowledge of the life cycle of the fluke is both necessary and illuminating. In elucidating on the complete life cycle of the paragonimus we have to fall back on the contributions of Kobayashi and Yokogawa. It seems that the ova of the parasite are coughed up in the sputum and either expectorated or swallowed and passed out in the feces and subsequently becomes the source of infection of the intermediate host which happens to be a snail, species melania. The miracidium after escaping from its shell penetrates these snails and after a certain period metamorphoses into a small sporocyst and then into a cercaria. The cercaria soon escapes from the snail into the water and bores its way into certain species of fresh water crustaceans which act as the second intermediate host. These crustaceans when eaten raw or half-cooked soon liberate the encysted cercaria in the intestines where the young fluke soon bores its way through the wall and thus migrate through the peritoneal cavity and finally burrows through the diaphragm into the lung. Here they mature where they may be found in large numbers (in cases of autopsy) in funnel-like cavities or cysts lined by fibrous walls which communicate with the bronchi, giving rise to many of the pathological and clinical features of bronchiectasis. Here they may live for around six years. Less often, the fluke invades other tissues, including the liver, testes, prostate, lymph nodes, skin, muscle and brain.

Pathology

According to Musgrave, there are four recognized types of lesions: namely, the non-suppurative lesion, consisting of tissue infiltration by the eggs of the fluke and later followed by round cell and connective tissue infiltration; the tubercle-like type of lesion consisting of a fibrous wall with the parasite and its discharged products in the center; the suppurative lesion, recognized by the large destruction of the tissue cells in the lesion forming caseous material in the center; and the ulcerated lesion which is charac-
terized by partly successful healing in certain parts of the lesion. These lesions although mainly encountered in the lungs may be met within many other organs of the body. In the lungs, the more advanced cases may present a picture of generalized or acute cirrhosis with cystic dilatation of the bronchi and tubercle-like abscesses. Leucocytic infiltration occurs about the parasites and there is frequently fibrous encapsulation (Figure 5).

Symptomatology and Diagnosis

The symptoms generally begin with a dry cough usually more noticeable in the morning. The fits of coughing may result in expulsion of a peculiar rusty-brown or pneumonic-like sputum. Abdominal symptoms are mainly in the form of slight pains and diarrhea with bloody stools. In generalized infestation there may be infiltration of the systemic lymphatic glands. When lodged in the brain the parasites may cause a peculiar form of Jacksonian epilepsy which may lead to hemiplegia, aphasia, visual disturbances and monoplegia. Eosinophilia is an early sign. Diagnosis is readily made by finding the operculated eggs in the more or less sanguineous sputum. Charcot Leyden crystals are often present in the sputum. Eggs swallowed with the sputum may be found in the feces. Ando has described a Bordet Gengou complement-deflection test, using an extract of the adult form of the worm as antigen to aid diagnosis in obscure cases of the abdominal and cerebral types.

Treatment

The fact that various authors recommend different drugs without unanimity in the efficacy of any single one proves that its cure has yet to be discovered. Drugs suggested by various workers and tried out in the treatment of the different cases presented here are: emetine hydrochloride, recommended by Kobayashi and Ando, which is said to lessen the sexual activity of the trematodes as a group; lipiodol injection into the bronchi as advocated by Bercovitz; prontosil as reported by Yokogawa, and Fuadin as suggested by some parasitologists we consulted on the theory that being effective in Schistosomiasis it may prove equally effective in paragonomiasis considering the many similarities between the causative organisms of the two diseases.

Case Reports

Case 1: E.E., 30 years old, female, single, Filipino, school teacher from Burauen, Leyte, was admitted to the Quezon Institute on June 24, 1948, with hemoptysis (½ sp. cup), chest and back pains. For the past eight years before admission she had been having distressing cough productive of rusty-brown expectoration. Chest and back pains were dull most
of the time. Four years before her admission she had her first hemoptysis amounting to about one fluid ounce of fresh blood, the attack occurring every day for a week. Sometime before admission she had an attack of diarrhea characterized by a mixture of fresh blood and mucus and accompanied by slight tenesmus. The family history was non-contributory. Physical examination failed to reveal anything of moment. Inquiry into the personal habits led to a tacit admission that she was very fond of eating raw fish and half-cooked crabs and other crustacea. Blood examination revealed an eosinophilia of 10 per cent and a sedimentation rate of 68 mm. after the first hour. Her sputum was heavily laden (3 plus) with paragonimus ova and was persistently negative for acid fast bacilli, and so were the results of three gastric washings.

Roentgenologic appearance of x-ray films was much like that observed in pulmonary tuberculosis of the productive type.

Fuadin was administered for a period of 15 days or a total of 40 cc. of the preparation which is equivalent to 340 mg. of antimony. After this series sputum examination revealed ova to be still in abundance. Lipiodol was then instilled intra-bronchially (10 cc.). A little later sputum was examined and the ova present was much reduced from a reading of 3 plus to 1 plus. Encouraged by this result we gave a second instillation two weeks later and three days after had the sputa examined again. This time reading was again 3 plus. Another two weeks and another instillation. One week later sputa when examined still showed 3 plus ova. By this time she was symptom-free and sought discharge. Although symptoms were abated markedly, treatment was pronounced unsatisfactory.

Case 2: C.T., 23 years old, a female, single, Filipino, laundry woman by occupation, coming from Ormoc, Leyte, admitted to the Quezon Institute on July 23, 1948, complaining of cough accompanied by blood streaked sputum. She had been having blood streaked sputa every now and then since the age of seven without any accompanying constitutional symptom. Four days before admission she had another severe cough with blood streaks again noticed in the sputum. No other constitutional symptom accompanying. Family history was non-contributory. Physical examination revealed impaired resonance over the interscapular spaces. Blood analysis revealed moderate anemia and marked eosinophilia (13 per cent). Sputum was 4 plus for ova of paragonimus, but persistently negative for acid-fast organisms on concentration method. Gastric washings also were negative. Roentgenologic examination showed shadows similar to the fibrotic and the nodose types of pulmonary tuberculous infection mixed with cyst-like shadows at the base. She was given Fuadin alone, receiving 16 cc. of the drug or an equivalent 136 mg. of antimony—the basic ingredient. Because of severe vomiting we were unable to give the full suggested dose of 40 cc. at the least. After a reasonable lapse of time we tried to resume treatment but with recurrence of vomiting more intense than the first time we were forced to abandon the treatment. On discharge she was symptom-free but with ova of parasite still present in sputum.

Case 3: M.B., a 40 year old male, married, Filipino, barber by occupation. Came from Dulag, Leyte, and was admitted as a bleeding case on October 13, 1947. His first attack of hemoptysis occurred three years before admission. Between then and the date of admission he had attacks
of cough accompanied every now and then by either chest or back pain and occasionally by both. His father died from tuberculosis. He confessed to a weakness for raw fishes. Physical examination revealed a reducible right inguinal hernia and no more. Blood examination showed an eosinophilia of 8 per cent and a sedimentation rate of 43 mm. after the first hour. Sputum on routine examination revealed ova of paragonimus in big numbers. Roentgenological examination revealed lung findings similar to that seen in exudative types of pulmonary tuberculosis, with cyst-like shadows surrounded by perifocal exudates in the region of the left hilum. After three injections with prontosil in doses of 5 cc. intra-gluteally he went home against medical advice. Force of necessity induced him to leave the hospital post-haste. Being the bread winner in a family of six (wife and four children) and not feeling anything untoward except for the one and only attack of hemoptysis which had subsided readily, he felt that he could not tarry too long in the hospital.

Case 4: M.G., a 20 year old female, single, Filipino, school girl, coming from Baybay, Leyte, was admitted on September 13, 1948, with hemoptysis (four tablespoonfuls) as main complaint. Her father and one brother died from pulmonary tuberculosis within six months of each other. No other important item in family history. Physical examination revealed nothing abnormal. Blood examination showed eosinophilia of 10 per cent and a sedimentation rate of 35 mm. after first hour. She received injections of emetine hydrochloride 1/3 gr. daily for six continuous days, followed by another six-day series after a brief three-day period of rest. After this medication sputum formerly 3 plus for ove of parasite became negative.

Figure 1: X-ray film taken on admission reveals densities involving IS-1, 2 and 3 anteriorly. Sputum heavily positive for ova of paragonimus.—Figure 2: X-ray film taken one week after admission. Patient has received only emetine hydrochloride injections (1/3 gr. daily for six days). Opacities still visible at IS-1 anteriorly. Discharged at this point. Sputum negative for ova of paragonimus.
Feces likewise were negative. Even the x-ray film showed appreciable diminution in the number of cyst-like shadows which we have come to associate with the disease. She was discharged after a three weeks stay in the hospital but has been coming regularly for sputum and radiographic control ever since. The last time she came for check-up was on October 29, 1949; her sputum was still negative for ova and x-ray film taken at the time showed further absorption of the perifocal exudates (FIGURES 1, 2, 3 and 4).

Case 5: E.M., a 22 year old single male, Filipino, laborer, coming from Jaro, Leyte, was admitted on December 19, 1949, with complaints of blood streaked sputum, cough, and backache. Nine months ago he noticed blood streaks in sputum. Two days later he submitted to a fluoroscopic examination in a private x-ray center and was told to seek hospitalization. One week later he was admitted in the San Lazaro Hospital where he was treated as a case of tuberculosis and given PAS tablets. He stayed there for eight months and received a total of about 400 gm. of PAS. He was discharged as much improved. One month later he had a recurrence of the hemoptysis for which reason he was admitted to the Quezon Institute. Five routine sputum examinations failed to reveal either acid-fast organisms or ova of parasites. Bronchial aspirations, however, when smeared, showed the paragonimus ova, but in such scanty numbers that it was seen only on re-check by a senior technician. Once the nature of the disease was made known to him, he indicated a desire to be treated by a parasitologist of his choice and thereby sought immediate discharge from the hospital, but not before the usual blood tests and radiographic examinations had been concluded. As usual the blood examination re-

![Figure 3](image1.png) ![Figure 4](image2.png)

*Figure 3:* X-ray film taken one month after discharge shows nothing new radiographically.—*Figure 4:* X-ray film taken three months after discharge. Up to this point there has been no recurrence of symptoms, and sputum has remained free from ova.
vealed eosinophilia 8 per cent, and sedimentation rate of 33 mm. after the first hour. X-ray film inspection showed the cyst-like shadows so frequently seen in this disease.

SUMMARY

It would be presumptuous to draw conclusions on the basis of such meager data as we have so far on hand. But for those who care to follow whatever lead may be hinted in this article it may not be amiss to recapitulate the basic features encountered by us during our observations of these cases.

There seem to be three main features shared by all the patients included in this study, namely, the origin of the patient, which is the Island of Leyte on the southeastern part of the Philippines, and the common presenting symptom for which they were confined to the Quezon Institute, which is hemoptysis.

No two of the five cases presented received the same treatment. One was given Fuadin injections alone, another both Fuadin and

FIGURE 5: Eggs of the paragonimus westermani. L.P. x 430.
Lipiodol, a third Prontosil, a fourth emetine hydrochloride, and one received no treatment in the hospital because of an expressed desire to be treated by a private physician of his own choosing. All told only the patient who received emetine hydrochloride injections manifested clinical cure. This is by no means a blanket indorsement of emetine as the best remedy for these lung-fluke infestations but it does pave the way for further studies on this interesting disease which in our opinion deserves to be included in Dr. King’s list of conditions giving rise to roentgenographic shadows (pp. 536-38, October 1949 issue of the American Review of Tuberculosis), similar to that of tuberculosis.

**RESUMEN**

Sería presuntuoso sacar conclusiones basadas sobre datos tan escasos como los que contamos al presente. Pero para aquellos que deseen continuar los estudios que se sugieren en este artículo, no sería demasiado recapitular los rasgos básicos que encontramos en nuestras observaciones de estos casos.

Todos los pacientes con Paragonimiasis incluidos en este estudio parecieron presentar dos rasgos principales, a saber: el origen del paciente, que fue la isla de Leyte en la parte sureste de las Filipinas, y el síntoma común que presentaron, y por el cual fueron hospitalizados en el Instituto Quezón, que fue hemoptisis.

Todos los cinco casos recibieron tratamiento diferente. A uno se le dieron inyecciones de Fuadin solas, a otro Fuadin y Lipiodol, a un tercero Prontosil, a un cuarto hidrocloruro de emetina y uno no recibió tratamiento en el hospital debido a su expreso deseo de ser tratado por un médico particular de su propia elección. Sólo el paciente que recibió hidrocloruro de emetina manifestó una curación clínica. No constituye esto una sanción absoluta de la emetina como el mejor remedio para estas infestaciones con lombrices pulmonares, pero sí allana el camino para estudios adicionales de esta interesante enfermedad que, en nuestra opinión, merece ser incluida en la lista del Dr. King de estados que causan sombras roentgenográficas semejantes a las de la tuberculosis (páginas 536-38, Octubre 1949, American Review of Tuberculosis).

**RESUME**

Il serait présomptueux de tirer des conclusions sur des cas aussi peu nombreux que ceux que nous avons en notre possession, mais il nous a semblé intéressant de récapituler, pour ceux que se tiennent au courant de ces questions, les faits que nous avons pu observer.

Il y a des facteurs capitaux qui sont propres à tous les malades compris dans cette étude: leur origine, tous les malades provenant...
de l’Ile de Layte à la partie sud-est des Philippines, et le symptôme commun pour lequel ils furent adressés au Quezon Institute: l’hémoptysie.

Aucun des malades, sur les cinq cas présentés, n’eut le même traitement. L’un eut de simples injections de “fuadine,” un autre de la “fuadine” et du lipiodol, les troisième du prontosil, le quatrième de l’hydrochloride d’émétine, et le dernier ne subit aucun traitement, car il désirait être traité par un médecin privé de son choix. Seul le malade qui reçut des injections d’émétine obtint une guérison clinique. Ceci ne signifie pas que l’on peut admettre que l’émétine est le meilleur traitement de cette affection, mais cela doit ouvrir la voie à des travaux ultérieurs pour cette affection intéressante, qui mérite d’être incluse dans la liste de celles dont les ombres radiologiques simulent la tuberculose.