TRICHOMONAS TENAX EMPYEMA IN AN IMMUNOCOMPROMISED PATIENT WITH ADVANCED CANCER

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Summary:
A 53-year-old male acromegalic patient with advanced rectal adenocarcinoma developed pleuritis in the course of cobalt irradiation, steroid treatment and chemotherapy. Examination of drained pleural fluid demonstrated numerous motile organisms, which were identified as Trichomonas tenax by Giemsa staining. Peptostreptococcus micros was also detected in the cultures of pleural fluid and blood. Treatment with metronidazole successfully eliminated the protozoa and cured the pyothorax.

KEY WORDS: Trichomonas tenax, empyema, pleural fluid, Peptostreptococcus micros, adenocarcinoma.

Three species of trichomonad parasitize human: Trichomonas vaginalis Donne, 1836, Pentatrichomonas hominis (Davaine, 1860) Wenrich, 1931, and Trichomonas tenax (Muller, 1773) Dobell, 1939. Trichomonas vaginalis usually inhabits the genital systems and P. hominis is found in the intestine. On the other hand, T. tenax is a generally harmless commensal organism in the human mouth, which is associated with poor dentition and oral hygiene. Several cases of pleural empyema caused by T. tenax have been reported (Memik, 1968; Walzer et al., 1978; Miller et al., 1982; Hersh, 1985; Ohkura et al., 1985). We report the first co-infected case of empyema with T. tenax and Peptostreptococcus micros.

CASE REPORT

A 53-year-old male acromegalic patient with rectal adenocarcinoma metastasizing in the brain, bone marrow and liver, was admitted to Kyoto University Hospital in Kyoto, Japan for cancer treatment. Irradiation of cobalt 60 was applied to the brain and bone marrow lesions. The patient was also given chemotherapy with methotrexate, fluorouracil and cis-Dichlorodiammine platinum for 5 cycles. The patient was treated with glycerol and dexamethasone for brain oedema. He had poor oral hygiene and pyorrhea alveolaris.

Laboratory findings at the end of chemotherapy were as follows: hemoglobin, 94 g/L; hematocrit, 28.3%; red blood cells, 2890 x 10^9/L; white blood cells, 17.1 x 10^9/L; platelets, 133 x 10^9/L; total protein, 5.4 mg/dL; total bilirubin, 0.9 mg/dL; GOT, 135 IU/L; GPT, 159 IU/L; alkaline phosphatase, 1132 IU/L; LDH, 328 IU/L; C-reactive protein, 22.1 mg/dL; carcinoembryonic antigen, 864 ng/mL; CA 19-9, 16444 U/mL and CA 125, 165 U/mL.

He suffered from pyothorax at the end of chemotherapy. On thoracentesis from the right pleural cavity, 200 mL of yellow, cloudy fluid was withdrawn and showed a large number of neutrophils and monocytes. Fresh wet preparations of the fluid revealed numerous flagellated, actively motile organisms with the typical appearance of trichomonads. The wet smears of trichomonads were immediately fixed in ethanol and stained with Giemsa. Cultures of pleural fluid and venous blood also yielded P. micros.

Metronidazole (1000 mg) was given orally twice a day for five days. Trichomonads were positive in the drained fluid over two days and became negative
from day three of the institution of metronidazole therapy. *P. micros* also disappeared after administration of ceftazidime, 2 g × 11 days and clindamycin, 900 mg × 10 days. Repeated examinations of mouth washings, gingival swabs, urine sediments and stools failed to reveal the presence of trichomonads before and after the administration of metronidazole.

**OBSERVATION OF TRICHOMONADS**

With direct light microscopic examination of pleural fluids, the organisms were readily identified as *Trichomonas* by the typical pear-shaped forms, flagellae, and undulating membranes. The characteristic wobbly, rolling motion was apparent.

The Giemsa-stained trichomonads (Fig. 1, left) had a length of 5 to 12 µm (average 8.1 µm) and a width of 4 to 10 µm (average 6.6 µm) (n = 50). They had four free flagellae 10 to 12.5 µm in length (average 11.6 µm; n = 36) and a fifth on the margin of the undulating membrane which did not reach the posterior end of the body. The nuclei were generally ellipsoid or ovoid with its longer axis at a slight angle to the anterior-posterior axis of the organism. The cytoplasm was delicately granular. These morphological characteristics were consistent with the previous descriptions of *T. tenax* (Honigberg & Lee, 1959; Beaver et al., 1984). Aggregates of different sizes of trichomonads were often seen (Fig. 1, right). The measurements of trichomonads also fell within the range reported for *T. tenax* (Honigberg et al., 1959; Beaver et al., 1984), while those of *T. vaginalis*, from similarly fixed and stained preparations obtained from a vaginitis patient, averaged 13.8 µm (9-19 µm) in length and 8.1 µm (5-13 µm) in width (n = 50).

**DISCUSSION**

*Trichomonas tenax* is an organism of the human mouth, inhabiting the tartar around the teeth, in cavities of carious teeth and in pus pockets in tonsillar follicles. Transmission is direct, from droplet spray from the mouth, kissing, or use of contaminated dishes and drinking water. Over 160 cases of trichomonad infection in upper respiratory tracts were reported throughout the world from 1867 to 1987 (Honigberg, 1990). A systematic survey using bronchoscopy and culture methods showed that *T. tenax* was found in the bronchi in 37 out of 370 cases (10%), mainly in patients with chronic pneumonia and chronic bronchitis in the USSR (Kazakova et al., 1980). In contrast, trichomonad infection in the pleural cavity is relatively rare. Five cases of pleuropulmonary infections have been reported from the USA (Memik, 1968; Walzer et al., 1978; Miller, 1982; Osborne et al., 1984; Hersh, 1985), two from France (Abed et al., 1966; Houin et al., 1973) and one from Japan (Ohkura et al., 1985). Furthermore, four cases showed co-infection of *T. tenax* and anaerobic bacteria (Memik, 1968; Walzer et al., 1978; Miller et al., 1982; Ohkura et al., 1985).

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Fig. 1. *Trichomonas tenax* in the pleural fluid showing a typical shape (A) and an aggregate of different sizes of trichomonads (B). Giemsa stain. Scale bar = 10 µm.
In Japan, Ohkura and colleagues (1985) reported mixed infection with *T. tenax* and *Escherichia coli* in the purulent pleural effusion from a 70-year-old homosexual man. In the present case, *P. micros* was also identified in pleural effusion. Since *T. tenax* is reported to feed on microorganisms in its environment (Honigberg et al., 1957), it is suggested that trichomonads could easily proliferate in the presence of concomitant bacterial infection.

The source of trichomonads in the present case was most likely the mouth, a known habitat of *T. tenax* species, because the patient had pyorrhea alveolaris. Searches for trichomonads in oropharyngeal washings and sputum, however, gave negative results. Walzer and colleagues (1978) and Miller and colleagues (1982) reported cases with trichomonas pleural empyema, but were unable to find the organism outside the pleural space. They suggested that oropharyngeal trichomonads were too few in number to be found in oral washing. *Trichomonas tenax* is widely distributed in the world and is generally found in the human mouth. Physicians caring for immunocompromised patients should include *T. tenax* empyema in the differential diagnosis of empyema of unknown origin. Wet preparation and Giemsa staining are essential for confirming the diagnosis. The importance of making the diagnosis is underscored by the availability of effective treatment with metronidazole.

**REFERENCES**


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