Chronological Observation of an AIDS Patient from Onset to Death and Post-mortem Autopsy Study

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The '32-year-old sailor' patient was a native Korean male, infected with HIV through heterosexual contacts in the high risk areas of foreign country, mostly during 1984 to 1986. During the following 6-months until his death, the skin nodules suggesting Kaposi's sarcoma, and penile ulcers like chancroid were gradually disappeared. Several skin diseases such as condyloma acuminate, generalized xerosis of the skin, acquired ichthyosis, seborrheic dermatitis, diffuse hair loss and alopecia developed. His health gradually deteriorated with general symptom such as weakness, weight loss, remittent mild fever, cough with sputum, and dyspnea with frequent pneumonia signs. The tongue became coated white and thick in which candida albicans was detected, and sore throat and dysphagia accompanied. The patients expired suddenly with acute respiratory distress syndrome, which was may be caused by a opportunistic infection of Pneumocystis carinii.

In post-mortem autopsy studies, most of the lung tissue showed the findings of severe interstitial pneumonia and hyaline membrane formation, and pneumocystis carinii and candida albicans were found in histopathological or microbiological examination. As other infections, acid fast bacilli suggesting Mycobacterium avium-intracellulare were found out in the lymph node, spleen, liver. Cytomegalovirus infection was found on the adrenal gland by histopathological examination. And various lymphoid tissue of the lymph node, spleen, thymus, respiratory tract, gastointestinal tracts showed severe lymphoid depletion with fibrosis. The other findings had multiple glial nodules in the cerebral white matter and focal segmental glomerulosclerosis. There wasn't any evidence of Kaposi's sarcoma. (Ann Dermatol 5(2):90–104, 1993)

Key Words: AIDS, Autopsy, Cytomegalovirus, Pneumocystis carinii, Mycobacterium avium-intracellulare

Acquired immunodeficiency syndrome (AIDS) is a symptom complex caused by HIV infection belong to Retrovirus family. It is clinically characterized by various opportunistic infections by different organisms, and tumors, and symptoms by HIV infection itself. It has become nowadays so spread worldwide that it is no more considered as endemic, ethnic, or limited to certain strata of the society. The number of the affected increase explosively, threatening the very existence of mankind. It is more so because of increased movement of people over the barriers of the countries and continents. Korea is not the exception from the threatening scourge. As expected, the AIDS is recorded to be gradually increasing in number. The first report of AIDS in the world came from a homosexual men in 1981, and that in Korea from a foreigner of the domestic staying in 1985. This patients was diagnosed as the first AIDS patient having Kaposi’s sarcoma and candidiasis in Korea. Shortly after the diagnosis, he was referred and managed until to his death by us. As far as we know, there isn’t AIDS patient in Korea expired by opportunistic infection of Pneumocystis carinii, candidiasis, and atypical mycobacterium, which were confirmed by autop-
sy studies. Here, we report his clinical courses with laboratory findings as well as epidemiological and post-mortem autopsy studies.

**REPORT OF A CASE**

**Patient:** A 32 year-old native Korea man.

**Chief complaint:** Pruritic skin nodules on the extremities, sore throat and white coated tongue, and genital ulcer.

**Family history:** His wife was also infected with HIV. But his two children were negative in serologic test for HIV. Otherwise were non specific.

**Epidemiology and past history:** He boarded on ocean going freighters and fishing boats for 9 years (from 1980 to 1988). The frequent episodes of heterosexual contacts was made with mostly prostitutes or native female in the high risk areas including in the Mombasa (Kenya), Port Elizabeth (Union of S.A.), Lisbon (Portugal), and other area (Manila, Davao, Jakarta, etc.) in decreasing order. These sexual contacts mostly occurred between 1984 and 1986. Also he had sexual contacts with his wife and prostitutes in Korea. His wife was confirmed to be a asymptomatic HIV Infection through the serologic test to HIV and physical examination on the Feb. 1988. His two children and any family were negative in serologic test of HIV (ELISA, Particle agglutination, and western blot). He had no history of homosexual contact, nor blood transfusion and drug abuse. With these careful history, we presumed that first infection may occurred approximately 2 or 4 years before in Africa.

**Present illness:** Genital ulcers appeared 7 days after last heterosexual contact with a prostitute on July 1987 in the Pilliphine. Symptoms of diarrhea, weight loss, and sore throat were followed. With these symptoms, he became back to home on Feb. 1988, and admitted to a hospital in the Puasan, where HIV infection was confirmed by serological test, and the diagnosis of AIDS was made with a Kaposi's sarcoma and esophageal candidiasis. On april 1988, he was referred our hospital with the chief complaints.

**Physical examination:** He was acute ill appearance, but alert mental state. He weren't icterus and anemic appearance. The lymph node on the neck, axilla, and groin weren't palpated. The liver was enlarged with two finger breath wide in right abdomen. Several pruritic and erythematous pigmented skin nodules were scattered in the extremities, especially low extremity (Fig. 1). The exudative and painful ulcers in genital foreskin and mucosa was discovered as confluent or discrete patches (Fig 2a). Pigmented verrucous papules were also noticed on the penile sulcus. (Fig. 2b). Diffuse scale and nail dystrophy disclosed on the feet and sole. In general, the skin was mild dry state and he complained of intermittent severe itching. The tongue was coated with a white plaque diagnosed as a candidiasis, and the mouth corner was fissured, diagnosed as a candidial cheilitis (Fig. 3).

**The clinical follow-up of general symptoms:** The body weight was continually decreased during the follow-up period. He frequently complained of substernal pain and sore throat in related to a appearance of white coating on the tongue. These used to recur whenever after the ceasing of ketoconazol medication with the clearing lesions. Recurrent diarrhea was also noted. With the progression of the disease, he had been chronic ill appearance. From about one month before death, fluctuating fever and productive cough developed. However the chest x-ray was still with in a normal limit. In addition, he used to fall into status of brief drowsiness about twice a day. The chest x-ray 'taken 5 days before death' revealed the findings of severe pneumonic infiltration. He was admitted under the impression of a pneumonia of Pneumocystis carinii. However, he died with an acute respiratory distress syndrome (Table 1).

**The clinical follow-up of skin manifestations:** The erythematous or pigmented pruritic nodules in the extremities were never progressed to a larger nodules beyond the 1.5cm in diameter, or to disseminated the other areas. These gradually turned into pigmented patches from 2 months before death. The painful genital ulcers 'small round ed at beginning' had a tendency to fuse into several large exudative ulcers. These lesions also gradually healed as pigmented patches in same time of skin nodules (Fig. 4). Skin dryness and pruritus was worsen through the whole period, and an distinctive ichthyosis on the anterior tibial area developed from 3 month before death (Fig.
5). Hair loss and diffuse alopecia of the scalp hair also progressed (Fig. 6). The pigmented reddish scaling patch suggesting seborrhieic dermatitis also noticed in the late stage of the period (Fig. 7). Tinea pedis and onychomycosis by Trichophyton rubrum continued during the follow-up. (Fig. 8) (Table 1).

**Laboratory and x-ray findings:** The Western blot assay for HIV revealed strong positive in band of gp41 capsule glycoprotein and p24 core protein. The screening tests of ELISA and Paticle Agglutination test also were positive through the follow-up period. The number of leukocyte, platelet, and hemoglobin in peripheral blood were decreased. Normocytic anemia advanced with the progression of the disease. The ratio of T4/T8 reversed as 0.04-0.15. The absolute numbers of CD4 lymphocyte were between 90 and 16/mm³. The percent of CD8 lymphocyte continuously increased, but normal at shortly before death. The serum gamma globulins of IgG (1900mg/dl) and IgA (400mg/dl) increased. The serum enzymes for liver function increased as 127U of alkaline phophatase, 85U of SGOT, and 21U of SGPT in

<table>
<thead>
<tr>
<th>Table 1. The Choronicologic follow-up observation of clinical symptoms and laboratory findings</th>
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<tr>
<td>Year (1984-1986)*</td>
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<tr>
<td><strong>Month</strong></td>
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<tr>
<td><strong>GENERAL SYMPTOMS</strong></td>
</tr>
<tr>
<td>Thrush, Sore throat, Dysphagia:</td>
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<td>Diarrhoea:</td>
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<tr>
<td>Body weight (Kg):</td>
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<tr>
<td>Fever, Cough, Sputum, Dyspnea:</td>
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<tr>
<td>Intermittently drowsy state:</td>
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<tr>
<td><strong>SKIN SYMPTOMS</strong></td>
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<tr>
<td>Pruritus:</td>
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<tr>
<td>Xerosis, Hair loss, T. pedis</td>
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<tr>
<td>Condyloma acuminatum:</td>
</tr>
<tr>
<td>Nodules “Kaposi’s sarcoma”</td>
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<tr>
<td>Penile ulcer:</td>
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<tr>
<td>Ichthysis, Seborrheic derm.:</td>
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<tr>
<td><strong>LAB. FINDINGS</strong></td>
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<tr>
<td>WBC [mm³]</td>
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<tr>
<td>Hemoglobin [mg/dl]</td>
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<tr>
<td>Platelet [x10³/mm³]</td>
</tr>
<tr>
<td>Lymphocyte subset [%]</td>
</tr>
<tr>
<td>CD11 (77+7)</td>
</tr>
<tr>
<td>CD8 (38+8)</td>
</tr>
<tr>
<td>CD4 (44+7)</td>
</tr>
<tr>
<td>CD8/CD4 (1+0.16)</td>
</tr>
<tr>
<td>CD19 (16+10)</td>
</tr>
<tr>
<td>NK cell (8+4)</td>
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<tr>
<td>Total protein [g%]</td>
</tr>
<tr>
<td>Albumin</td>
</tr>
<tr>
<td>Globulin</td>
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<tr>
<td>IgG (1250+400) [mg/dl]</td>
</tr>
<tr>
<td>IgA (210+130)</td>
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<tr>
<td>IgM (160+110)</td>
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<tr>
<td>APase (35-95)</td>
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<tr>
<td>SGOT (5-35)</td>
</tr>
<tr>
<td>SGPT (4-38)</td>
</tr>
<tr>
<td><strong>Bacterial Culture on penile ulcer:</strong> Streptococcus Group G, Pseudomonas</td>
</tr>
<tr>
<td><strong>Skin test:</strong> Anergy to Multi CMI kit, DNBC</td>
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<tr>
<td><strong>Urine protein [30mg/dl]</strong></td>
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</tbody>
</table>

**: Solid lines express the period showing symptoms.
*: The period suggested to be infected by HIV.
[ ]: Unit.
( ): Normal range.
**: Absolute number/mm³.
the late stage of follow-up (Table 1). But HBs Ag
and HBs Ab were negative. The skin tests by the
multi CMI and DNBC (dinitrochlorobenzene)
were not reactive. Chest X-ray taken five days be-
fore death revealed serious pneumonic infiltra-
tion of alveolar pattern in left lung and right upper
lobe, which was more severe in the central part
than the periphery. The pneumonic infiltration of
interstitial pattern in right mid lung field was also
noted. On one day before death, both lung fields
were deteriorated with diffuse and severe infiltra-
tion (fig. 9). Staphylococcus aureus, and Pseudo-
monas aeruginosa grew in the culture of excu-
date and tissue pieces of genital ulcers.
However any bacteria such as Hemophilus
ducreyi, mycobacterium, and any fungus were not
cultured. Candida albinacs and Trichophyton
rubrum were cultured in oral cavity and feet
respectively.

**Histopathologic findings of skin lesion:** The skin
biopsy was perfomed on the erythematous
and pigmented nodules three times during the
follow-up with similar findings. The epidermis had
acanthosis and hyperkeratosis. The dermis rev-
ealed several patches of capillary proliferation, and
thickening of vessel wall, and inflammatory cell
infiltration of lymphoid cell and histocyte.
Although these may be suggested as an early find-
ing of Kaposi’s sarcoma (Fig. 10), any charac-
teristic findings of Kaposi’s sarcoma weren’t found
in consecutive three times of skin biopsy in simi-
lar lesions. In the genital ulcer, there was non-
specific granulomatous pattern with many capil-
lar proliferation and diffuse pleomorphic inflam-
matory cell infiltration. The findings from the
verrucose lesion was compatible with codyloma
accumatum (Fig. 11). All biopsy specimens were
also subjected to special stains including PAS,
hemosiderin, Gram, AFB with non specific find-
ings. The healed pigmented lesions of skin nod-
ules demonstrated that acanthosis, increased
pigmentation in basal cell layer, lichenoid in-
filtration of lymphohistiocytic cells in the papillary
dermis, and proliferation of fibrocyte and capil-
lar with dilated and thickened wall in the der-
mis (Fig. 12).

**Treatment:** The patient was taken intermittent
treatment because of social and his personal
problem. For genital oozing ulcerated lesion, top-
ical treatment of wet compress and topical antibi-
otics, and oral antibiotics including tetracycline,
Bactrim, ampicillin, and erythromycin were given
with a improvement of the lesions. For oral and
esophageal candidiasis, Ketoconazol 200-400mg
daily, was given with the fast clearing of the oral
lesions and symptoms. Antihistamines was used
for severe pruritus. Oral trimethoprim sul-
famethoxazole and supportive treatment carried
out for Pneumocystis carinii pneumonia and acute
respiratory distress syndromes.

**Post-mortem examinations:** The main organs in
thorax, abdomen, pelvis, and scalp were in-
dividually removed by Lutulle’s method*. The
removed organs were inspected by raw eye, and
fixed by 10% neutral formalin. The routine and
special staining including H&E, PAS, methena-
mine silver, Gram, AFB, toluidin blue were per-
formed. The immunohistochemical staining for
HIV-p24 protein, and electron microscopic exami-
nation was also done. Fungus culture was per-
formed with body fluid of esophagus, stomach,
and bladder obtained under the sterilized condi-
tion. The findings of the examination are
described in each organ as follows (Table 2).

**Lymph organs and the spleen:** The structure of lymph
follicles and lymphocyte in the cervical and
mediastinal lymph node almost disappeared,
and were replaced with diffuses fibrosis as so
called 'burn-out appearance' of terminal stage of
AIDS (Fig. 13, 14). The immunohistochemical
stain for HIV-p24 was positive in lymphocyte and
histocyte (Fig 15). The spleen was enlarged as
200g in weight. The number of acid-fast bacilli
suggesting mycobacterium avium intracellulare
was disclosed in histocytes by AFB stain (Fig 16).
The depletion of white pulp and arteriole, and
fibrosis of periarteriolar lymphatic sheath with in-
filtration of many histocyte and a few plasma cell
were found (Fig 17). The tonsil also showed the
similar findings with lymph node (Fig 17). Thymus
was severely atrophied. The other lymphoid
tissue including bronchial associated lymphoid tis-
sue and gut associated lymphoid tissue similarly
had a decrease of lymphocyte and fibrosis (Fig 19,
20).

**The lung:** It was grossly edematous appearance.
Microscopic examination revealed severe and
diffuse interstitial pneumonic infiltration, and hya-
Table 2. Summary of autopsy findings.

<table>
<thead>
<tr>
<th>Organs</th>
<th>Findings</th>
<th>Studies</th>
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<tbody>
<tr>
<td>Lung</td>
<td>Severe pneumonic infiltration</td>
<td>H&amp;E, EM, TBS, PAS, FC</td>
</tr>
<tr>
<td></td>
<td>Pneumocystis carinii</td>
<td></td>
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<tr>
<td></td>
<td>Candida albicans</td>
<td>H&amp;E</td>
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<td></td>
<td>Lymphocyte depletion of BALT</td>
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<tr>
<td>Lymph node</td>
<td>Burn-out appearance</td>
<td>H&amp;E, AFB</td>
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<tr>
<td></td>
<td>Acid-fast bacilli</td>
<td></td>
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<tr>
<td></td>
<td>HIV p24 protein</td>
<td>IPS</td>
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<tr>
<td>Spleen</td>
<td>Loss of white pulp, fibrosis</td>
<td>H&amp;E, AFB</td>
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<tr>
<td></td>
<td>Acid fast bacilli</td>
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<tr>
<td>Thymus</td>
<td>Severe atrophy</td>
<td>H&amp;E</td>
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<tr>
<td>G-I tract</td>
<td>Lymphocyte depletion of GALT</td>
<td>H&amp;E, FC</td>
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<td></td>
<td>Candida albicans</td>
<td></td>
</tr>
<tr>
<td>Bladder</td>
<td>Candida albicans</td>
<td>FC</td>
</tr>
<tr>
<td>Liver</td>
<td>Acid-fast bacilli</td>
<td>AFB, H&amp;E</td>
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<tr>
<td></td>
<td>Mild fatty change</td>
<td></td>
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<tr>
<td>Adrenal gland</td>
<td>Cytomegalovirus</td>
<td>EM</td>
</tr>
<tr>
<td>Brain</td>
<td>Gliosis</td>
<td>H&amp;E</td>
</tr>
<tr>
<td>Kidney</td>
<td>Focal glomerulosclerosis</td>
<td>H&amp;E</td>
</tr>
<tr>
<td>Testis</td>
<td>Atrophy</td>
<td>H&amp;E</td>
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Abbreviation: EM (electron microscopy), TBS (toluidine blue stain) FC (fungus culture), BALT (bronchus associated lymphoid tissue), IPS (immunoperoxidase stain), GALT (gut associated lymphoid tissue)

line membrane formations in alveoli (Fig 21), and candidial hyphae and spore in PAS stain (Fig 22). The infection of Pneumocystis carinii was proved by methenamine silver stain, and electron microscopic examination (Fig 23).

The liver: It was mildly enlarged as 2300g in weight. Microscopical examination revealed histiocytic and lymphocytic infiltration, and mild fatty degeneration of hepatocyte in portal area. The numerous acid-fast bacilli were demonstrated by AFB stain in the infiltrated histiocyte of portal area (Fig 24).

The kidney: The external appearance was nonspecific. Microscopic examination showed the finding of focal segmental glomerulosclerosis (Fig 25). Electron microscopic examination disclosed the irregular thickening of basement membrane with a intramembranous dense deposit (Fig 26).

The structure of tubules, interstitium and blood vessel were in normal.

Adrenal gland: The gross appearance was nonspecific. Microscopically, large giant cells were found between epithelial cells of zona fasciculata (Fig 27). This cells are including basophilic intranuclear inclusion, which were proved as virus particles of cytomegalovirus by EM (Fig 28).

The testis: The spermatic cord was moderately atrophied, and the basement membrane was thickened.

The bone marrow: The percent of bone marrow cell was 60. Otherwise was non-specific.

The brain: The cerebral white matter had the multiple foci of nodular proliferation of fibrillary or gemistocytic astrocytes. (Fig. 29, 30). However the peripheral inflammatory cell infiltration or inclusion body of cytomegalovirus infection weren't
LEGEND FOR FIGURES

Fig. 1. Erythematous or pigmented pruritic nodules in both legs.

Fig. 2. Large exudated painful ulcer in prepuce of penis (a), and condyloma acuminatum in sulcus of penis (b).

Fig. 3. White patches on the tongue by oral candidiasis.

Fig. 4. Healed pigmented patches of skin lesion at late stage of the disease.

Fig. 5. Acquired ichthyosis and dryness in the shin.

Fig. 6. Diffuse hair loss and alopecia.

Fig. 7. Scaling erythematous pigmented patch of seborrheic dermatitis in the forehead.

Fig. 8. Diffuse scaling lesion of the feet by Trichophyton rubrum.

Fig. 9. Severe pneumatic infiltration of the both lung fields in the chest PA one day before the death.

Fig. 10. Focal vascular proliferation and thickening and perivascular cell infiltration in the dermis (H&E, ×40).

Fig. 11. Hyperkeratosis, parakeratosis and acanthosis including vacuolated and pyknotic cell (H&E, ×200).

Fig. 12. Hyperkeratosis, lichenoid inflammatory cell infiltration in the upper dermis (H&E, ×100).

Fig. 13. Loss of follicular architectures with lymphoid depletion, histiocytosis, and fibrosis. (Cervical node, H&E stain ×40).

Fig. 14. High power view Fig. 13. (Cervical node, H&E stain, ×200).

Fig. 15. Loss of follicular architecture, present of moderate degree of histiocytosis, and HIV-p24 positive cells. (Mediastinal node, Immunohistochemical stain for HIV-p24, ×100).

Fig. 16. Large numbers of acid-fast bacilli suggesting mycobacterium avium-intracellulare in cytoplasm of histiocytes. (Cervical node, AFB stain, ×1,000).

Fig. 17. Depletion of white pulp with fibrosis of periarteriolar lymphatic sheath and increase of histiocytes. (Spleen, H&E stain, ×200).

Fig. 18. Loss of follicular architectures. (Tonsil, H&E stain, ×100).

Fig. 19. Complete loss of bronchus-associated lymphoid tissue (BALT) with diffuse fibrosis, and mild proliferation of histiocytes. (Lung, H&E stain, ×100).

Fig. 20. Marked atrophy of submucosal lymphoid follicles (a similar finding is noted in Peyer's patches throughout the ileum and colon). (Appendix, H&E stain, ×40).

Fig. 21. Diffuse interstitial pneumonitis with edema and hyaline membrane formation.

Fig. 22. Hyphae and spores of Candida albicans. (Lung, PAS stain, ×200).

Fig. 23. Electron micrograph of pneumocystis carinii showing crescent forms (C) from which merozoites (arrow) have been discharged (inset: round and oval forms of pneumocystis carinii filling intraalveolar space, Methenamine silver stain, ×200). (Lung, ×6,000).

Fig. 24. Minimal fatty change of hepatocyte and infiltration of macrophages filled with acid-fast bacilli in portal area. (Liver, AFB stain, ×400).

Fig. 25. Focal segmental glomerulosclerosis is noted. (Kidney, Toluylene blue stain ×400).

Fig. 26. Electron microscopic finding of Fig. 25 disclosed irregular thickening of basement membrane (BM) with an intramembranous dense deposit (arrow). (Kidney, ×6,000).

Fig. 27. Discrete cytomegalic cells with prominent intranuclear inclusions in zona fasciculata. (Adrenal gland, H&E stain, ×200).

Fig. 28. Electron microscopic finding of Fig. 27 shows numerous viral particles in nucleus. (Adrenal gland, ×80,000).

Fig. 29. A glial nodule composed of fibrillary astrocytes. (Cerebral white matter, H&E stain, ×100).

Fig. 30. Another glial nodule chiefly composed of gemistocytic astrocytes. (Cerebral white matter, H&E stain, ×100).
found.

In the fungus culture, candida albicans grew in fluid of esophagus, stomach, and bladder.

**DISCUSSION**

HIV (human immunodeficiency virus) penetrate the human cell through the CD4 cellular receptor 'membrane glycoprotein', which found mainly T cell, and some B cell, macrophage, natural killer cell, neuronal cell. Consequently, progressive deterioration of CMI (cell mediated immunity) is the main pathomechamism in the AIDS. The AIDS is well known to be found predominantly among homosexual man, intravenous drug abuser, peoples with hemophilia, and recipients of infected blood products in early stage of the epidemic. However, throughout the world including our country, HIV infection in heterosexual men, and women have grown in the number. De rienzo et al. reported that HIV infection developed in 16 Person among the 106, who had heterosexual intercourse over the three time with HIV infected person. This patient was first confirmed AIDS case among native Korean lived in the country. He had many heterosexual intercourse with prostitutes in HIV epidemic area including Africa, Philippine between 1984 and 1986.

The early detection of HIV infection is most important to preventing AIDS because of a long incubation period, and uncurability of HIV infection. The popular screening tests for the HIV infection by the detecting circulating antibody to HIV are ELISA and indirect particle agglutination test. To confirming the HIV infection, the Western blot test is generally used in Korea. This patient was detected by screening tests, and confirmed by western blot test showing strong positive at band of gp41, p24, and p18.

To predict the time of progression to AIDS after HIV infection is still vague. In general, it depend on environmental factors including genetic type of host, nutritional status, superinfection of other sexual transmitted disease, and several immunological factors including number and function of CD4 lymphocyte, and rate of a decrease in antibody to p24 antigen. Melbye et al. reported that AIDS appear in 4 or 5 years after HIV infection. Tayler et al. stated that the percent of the progression to AIDS from HIV infection was 2 percent in 2 year and 11% in 4 years after infection. Moss et al. reported that half of HIV infections may progress to AIDS in 6 years. It is generally accepted the thirty percent of HIV infections may progress to AIDS, and the risk increase remarkably in 3 years, in spite of different area and groups of HIV infections. In this case, we presumed that his incubation period may be 2 or 4 years based on the careful history. And the coinfection of other sexual transmitted disease may speed up the development of AIDS, because the development of genital skin lesions after sexual intercourse was followed immediately by the general weakness, diarrhea, weight loss, and sore throat.

Even though no absolute criteria of clinical or laboratory findings of AIDS, the findings suggesting the progress from HIV infection to AIDS have been reported. These are that sudden decrease of CD4 lymphocyte, the level of serum IgA and IgM, serum neopterin, beta 2 microglobulin, responsiveness to viral glycoprotein, delayed type skin reaction, oral candidiasis, and skin pruritus. The count of peripheral T lymphocyte subset have been accepted to be most reliable data for evaluating the status of HIV infection. Although little difference with authors, the HIV infection with the absolute number of CD4 lymphocyte of below 200/ul may progress to AIDS at 25% within 1 year and 50% within 2 years. Especially, sudden decrease of T cell count may suggest that presence of additional factors for the progression to AIDS. Guarda et al. reported that average percent of CD4 lymphocytes was 5.6% (normal 30-56%) in his 13 case's autopsy. The average duration from diagnosis to death of AIDS by Reichert et al. was 7 months. The decrease of leukocyte and hematocrite may occur due to an inhibition of granulocyte, mono cyte, progenitor cell in bone marrow by uncertain action of viral glycoprotein in HIV Infection and AIDS. The decrease of platelet count also may result from the destruction by circulating immune complex.

In this case, he had suffered general pruritus and oral candidiasis as a initial symptom. The CD4
lymphocyte count was 10% at first visit and 3% at death. The skin tests for CMI were negative through the whole period. Also leukopenia and thrombocytopenia continued until death.

The clinical symptoms with the progression of HIV are variable. These are fever, night sweat, lymph node swelling, enlargement of liver and spleen, loss of appetite, diarrhea, weight loss, symptoms by infection and tumor\textsuperscript{28}. In this patient, diarrhea, weight loss and oral candidiasis began first, and fever, cough and sputum, dyspnea, mental drowsiness were followed with the progression of the disease.

There are many kinds of skin manifestations in HIV infection and AIDS. These have been known to be a close relationship to peripheral T cell number, in which of 100/mm\textsuperscript{3} skin lesions generally appear\textsuperscript{26}. Goodman et al \textsuperscript{27} reported that these skin lesions may be classified into tumor lesion, infectious lesions, and other skin lesions. The main skin lesions are followings; candidiasis (47%), dermatophytosis (30%), herpes simplex (22%), molluscum contagiosum (9%), seborrheic dermatitis (32%), acquired ichthyosis and xerosis (30%). In addition, psoriasis, vascular proliferating disease, granuloma annulare, pyoderma gangrenosum, alopecia, yellow nail syndrome, eosinophilic folliculitis were noted in AIDS\textsuperscript{27}.

The findings of post-mortem examination are diverse with the progression of the disease. In general, these may be classified into the alteration of all lymphatic organ related to immune deficiency, many kinds of infection, and tumor \textsuperscript{(21)}.

The lymph node is a major organ affected by HIV. The initial changes are the proliferation of lymph follicles and focal loss of lymphocyte in the subcortical area. The change of late stage is the burn-out lymph node characterized by the loss of almost lymphocyte, and reactive fibrosis. The immunohistochemical staining’s for T cell marker reveal the profound decrease of ratio of CD4/CD8. The CD4 lymphocyte are positive for HIV antigen in immunohistochemical staining\textsuperscript{28}. The spleen are similarly involved by depletion of lymphocyte and reactive fibrosis in chiefly the white pulp and pericentral arterioles. Also erythrophagocytosis and extramedullary hematopoiesis are sometimes observed\textsuperscript{21, 28}. The changes of the thymus are characterized by atrophy, loss of lymphocyte, and calcification of Hassall’s corpuscle. This case disclosed the all characteristic findings of AIDS in the lymph nodes, the spleen, the lymphoid tissue of the tonsil, the ileum, the appendix, the bronchus.

The opportunistic infections by different organism such as protozoa, fungus, bacteria, virus, rarely parasites, are a prominent feature in the AIDS, and by which the most of AIDS patients die. The clinical symptoms by the opportunistic infections in AIDS patients are more atypical and unique clinical feature comparing to that of other immunodeficiency syndrome\textsuperscript{21, 22}.

The death in the AIDS mostly resulted from the respiratory insufficiency, disturbance of neural system, persistent diarrhea, disturbance of blood coagulation, which are caused by the different infections\textsuperscript{29}. The Pneumocystis carinii ‘a kind of protozoa’ are well known to be a most common an lethal opportunistic infection in AIDS. The diagnosis is possible through the special stainings including Gram stain, PAS, methenamine silver\textsuperscript{30}. In this case, we demonstrated the existence of Pneumocystis carinii and candida in lung tissue, which was suggested as the direct cause of respiratory insufficiency. Other protozoa infection such as Toxoplasma gondii, Cryptosporium, Isopora belli, Entamoeba histolytica, Giardia lamblia and so on have been reported\textsuperscript{28}.

Candidial infection is the most common fungal infection, and considered as a early sign of AIDS in HIV infection\textsuperscript{17}. It often advance to esophagitis and pneumonia by dissemination\textsuperscript{26}. This patient presented the white coated tongue, and esophagitis as an initial symptom. The fungal hyphae and blastospre were disclosed in PAS staining of lung tissue. The Candida albicans was isolated from the fluid of stomach, bladder and lung. So we presumed that the disseminated infection of candida albicans may also contribute to the death. In addition, Cryptococcus neoformans, Histoplasma capsulatum, Coccidiodes immitis and Sporothrix schenckii have been reported as fungal infections in the AIDS.

Mycobacterium avium intracellular (MAI) ‘a kind of Mycobacterium’ is an ubiquitous atypical acid-fast bacilli, and rarely infected human until appearing of AIDS. The disseminated infection with MAI appears frequently in AIDS, and causes
many symptoms such as lymphadenopathy, hepatomegaly, splenomegaly, pancytopenia, pneumonia, diarrhea, mycobacteremia. We demonstrated numerous acid-fast bacilli at the lymph node, spleen, and liver of autopsy. This organism was considered MAI by the morphological and clinical findings even though not performing the culture. In addition, many bacteria such as Nocardia species, Listeria monocytogenes, Legionella species, Treponema pallidum may cause the infection in the AIDS.

Cytomegalovirus (CMV) is a most common viral infection in AIDS patients. This virus usually cause the disseminated infections involving mainly lung, adrenal gland, gastrointestinal tract and others such as endocrine organ, liver, brain. This infection can be diagnosed by examining the intracellular inclusion body. We found histopathologically and electronmicroscopically the existence of CMV infection in adrenal gland. Other virus such as Epstein Bar virus, herpes simplex and zoster, polyma virus, molluscum contagiosum also may infect the AIDS patient.

Kaposi's sarcoma is most common neoplasm in AIDS patients and mainly found in homosexuals. It is characterized by sudden appearance of multiple skin lesions in clinical findings, and proliferation of vessel and endothelial cell, and spindle shaped cell in histologic findings. The spontaneous remission of Kaposi's sarcoma may occur in 10% of classic type. In the case of AIDS, similar cases were reported by Maurice et al. and Janier et al. The present case was diagnosed at first as the AIDS patient having Kaposi's sarcoma. However, the nodular skin lesions suggested as the lesions of Kaposi's sarcoma, were gradually disappeared, and cleared completely at the time of autopsy. We couldn't find any evidence of typical Kaposi's sarcoma in the repeated biopsies of the skin lesions during the follow-up, and in any internal organ during the post-mortem examination. Consequently, we presumed that the skin lesions may be a dermatosis simulating to Kaposi's sarcoma such as granuloma pyogenicum like lesion, Granuloma annulare, lichenoid granulomatous papular dermatosis. Other neoplasma such as lymphoma, oat cell carcinoma, and malignant melanoma have been reported as a neoplasm occurred in the AIDS.

The renal disturbance have been accounted about 10% of the AIDS. Its clinical features are of acute renal failure, glomerulonephritis, and chronic renal failure appear. The usual histological findings are seconary to focal nodular glomerular sclerosis like this case.

The neurologic and mental disturbance such as acute non-infectious meningitis, subacute menigitis, vacuolated myelitis are discovered in 60% of AIDS. The findings of subacute menigitis is the most common in the post-mortem examination. These disclose the infiltration of multinucleated giant cells, macrophage, and lymphocyte, and proliferation dendrocyte and astrocytes in cerebrum, cerebellum, midbrain, and spinal cord.

Although the pathogenesis of neurologic abnormality is still unknown, it has been suggested that inflammatory response to HIV or direct injury to neural and endothelial cells of HIV, competitive inhibition of neuroleukin with HIV-gp120, and CMI infection. In present case, multiple focal nodular proliferation of fibrocytic astrocyte and gemistocytic astrocyte was recognized without inflammatory cell infiltration. These findings may be resulted from CMV infection and cellular response to HIV.

The testicular atrophy, spermatic maturation arrest, and thickening basement membrane and fibrosis in seminiferous tubules were observed in the autopsy, however the mechanisms of the testicular pathology remains unclear.

REFERENCES

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