On the Mitotic Rates of Human Cancer and Human Fetal Cells
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1) The chromosome figures of the human cancer cells were observed on 41 human cancers, mainly stomach cancers. The materials were excised at operation from the peripheral areas of the cancers where they seemed to be fully developing. The mitotic rate of primary cancer in the digestive organ was, in general, markedly lower than that of the metastatic cancer in the lymph node of the concerned case. But in 5 cases fixed immediately after excision of the primary cancer the mitotic rate was almost the same as that of the metastatic cancer in the lymph node.

a) The mitotic rates of the cancer cell were of varying degree in 26 cases of the stomach cancers, and 2.7±0.03% on an average. The mitotic rate in the prophase, metaphase and anaphase was respectively 37.3±0.7%, 55.2±0.7% and 8.3±0.4%. The P/M index was less than 1.0. The mitotic rate showed a tendency to be in inverse proportion to P/M index. On mammary, rectal and maxillary cancers the same result was also obtained. The above-mentioned fact indicates definitely that the mitotic rate of the cancer decreases in the prophase and increases in the metaphase unlike that of the fetal cells mentioned below. This observation coincides with opinion of Timonen and Thermann that the mitotic rate of the cancer cells is markedly higher in the metaphase than that of the normal tissue cells in the same mitotic stage.

On examination of 2 cases of human sarcomas, the mitotic rates of the sarcoma cells in the prophase, metaphase and anaphase were found in the similar relation to the stomach cancer cells. In other words, the same feature of mitosis as
malignant growth was noticed in sarcoma cells as in cancer cells.

In one case of cystic papilloma of the ovary, the mitotic figures were seen in $1.3\pm0.09\%$, and the mitotic rates in the prophase, metaphase and anaphase were respectively $58.0\pm3.5\%$, $32.0\pm3.3\%$ and $10.0\pm2.1\%$. This relation between the mitotic rates of such benign tumor cells in each mitotic stage was quite different from that of the cancer cells and was similar to that of the fetal cells mentioned below.

b) In order to investigate abnormal mitosis of the cancer cells the chromosome figures of the cancer cells in the metaphase and anaphase were, according to Makino's method, classified into 3 types such as division type, aberrant type and disintegration type. The ratio between these three types of the chromosome figures varied in each case of human cancer and it did not seem that division type was, as seen in Yoshida's sarcoma, numerous when the mitotic rate was high. The appearance of aberrant type also showed a tolerable variation in each case of cancer. Generally speaking, the majority of aberrant types were of multiploid, multipolar-multinuclear and unequal mitosis, and adhering of the chromosomes was seen in $14.4\pm0.6\%$ of aberrant type of the chromosome figures. Abnormal mitosis was difficult to find in the human cancer cells because of their small cell size. Some of abnormal types such as adhering, scattering and displacement of the chromosomes were considered as artificial products due to "squash" technic.

It is assumed that normal mitosis may be carried on by temporal harmony between both mitotic actions occured in the spindle fibers and the chromosomes, and that most of abnormal mitosis of the cancer cells may be caused by precedence of mitotic action in the spindle fibers before that in the chromosomes. For this reason, mitotic action in the chromosomes of the cancer cells is likely to proceed to the metaphase before the prophase being finished, and abnormal mitosis of the cancer cells arising from such shortening of the prophase shows, when it is more severe, a disintegration type and finally disappears without proceeding to the anaphase. On the other hand, the prolongation of the metaphase may be caused also by delay of mitotic action in the chromosomes.

2) The chromosome figures of the human somatic cells in physiological growth were examined on the epithelial cells of the stomach and small intestine mucosa of 22 human fetuses obtained by artificial abortion in the 8th to 16th week of gestation, using Carnoy's fixation, Feulgen's staining and "squash" technic immediately after excision.

The mitotic rate of the human fetal cells was $2.1\pm0.03\%$ on an average, and was $66.5\pm0.7\%$ in the prophase, $27.0\pm0.7\%$ in the metaphase and $6.3\pm0.4\%$ in the anaphase. The P/M index was greater than 1.0. In a few cases the numbers of
the chromosomes were approximately 48, and also scattering, adhering and displacement of the chromosomes were noticed. It was difficult to determine whether those figures of the chromosomes were artificial products. Neither multipolar nor unequal mitosis were seen.

50. 瘤性腹膜炎患者的腹水内癌細胞について

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最近動物における腹水腫瘍について種々の新知見が見出され、一方 Nitromin の如き制癌剤を腹腔内に注入して腹水内癌細胞の変化を観察した報告がある。

私は癌性腹膜炎患者的 3 例についてギーザ, パパヨコ, Acetic gentian violet 染色法を用いて腹水内癌細胞を観察しつつ Nitromin 腹腔内注入の影響を追究したので報告する。

第 1 例は 69 才の女子で腹部膨満を主訴として当内科に入院、その腹水内に多数の癌細胞を認めたが、その出現率は腹水内細胞 500 個について 5.8％を占め、癌細胞のみ 500 個について見ると単核のものが 73.9％、2 核性 7.2％、3 核以上 4.3％で就中分裂像は 1.8％を占め、著明な異常核形を 0.2％に見られた。さらに印環細胞は 12.6％の高率に見られ細胞形質内の小空胞形成より拡大そして完全な印環細胞に至るまで、種々の過程のものが見られ癌細胞より形成されつつある事を想像させるものであり、さらに細胞の周辺に残る細胞形質の形態は肝硬変の腹腔濁出血中に見るものは異って診断的意義がある事を思わせるものであった。

以上の成績から癌性腹膜炎の診断の下に Nitromin の腹腔内注入を開始した。すなわち毎回 10 ないし 50 mg を 20 cc の生理的食塩水に溶解して計 6 回注入した。腹水内細胞について注入と同時に好中球は著明に増加し癌細胞の速やかな減少消失を認めたが、癌細胞消失後には再び好中球は減少しリンパ球の増加が見られた。

さらに注入により発熱、上腹部痛等の副作用を来したので一応中止し静注を開始、すなわち 5 回に亘り毎回 10 ないし 40 mg を静注したが患者は初回翌日より尿量の増大に気付き約 20 日間 1000 ～ 1500 cc の排尿を維持し同時に腹部の縮少を認めた。

以上の経過中に病状が次第に好転したので外科に転科し開腹手術を受けた。ところが手術者の見たところでは腹部は肉眼的に結核性腹膜炎の像を呈し、触知した Tumor は大網が腸管