Morphological Studies of the Metastatic Process after LIO-1 Tumor Transplantation by Different Methods

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Variants of injection of LIO-1 lymphosarcoma cell suspension were studied. The number of animals with local metastases was higher after injection of LIO-1 cell suspension into the mouse paw sole. This method of tumor cell injection is suggested as the metastasizing model for experimental studies.

Key Words: *mice; LIO-1 lymphosarcoma; injection; local metastases*

The problem of cancer and organization of its adequate treatment remain one of the main complex problems of modern medicine. Clinical process during the treatment of tumor patients is "significantly impeded by local metastases, which had been present in the majority of patients before diagnosis and treatment" [3].

Until recently, the metastatic process was assumed to be terminal, fatal, and irreversible process. However, due to recent progress in our understanding of the metastatic process, which is determined by the status of a complex of defense systems of the organism, the opinion on the fatal nature of the metastatic process started to change. It has been reported that tumor cells are transported to various organs at the earliest stages of tumor process and exist there for a long time in a "dormant" status, while the time of their "awakening" depends on many internal and external factors determining the metastatic process [2,4].

The known experimental tumors of different genesis transplanted to animals are used for studies of tumor growth regularities and tumor-host relationships. Transplanted tumors are used for selection of anticancer drugs, studies of approaches to tumor treatment, evaluation of the modes of radiation exposure and their impact for the tumor and the adjacent intact tissue [1].

However, there is no easily reproducible local metastasizing model to be used in many animals with primary tumors, and hence, we tried to create such a model.

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MATERIALS AND METHODS

Experiments were carried out on 55 outbred female mice (24-26 g) kept under standard conditions of laboratory animal clinic with free access to water and food.

Lymphosarcoma LIO-1 strain was used for transplantation. This strain is characterized in handbook of experimental therapy of tumors [1]. Total count of tumor cells in 0.2 ml suspension was evaluated in Goryaev's chamber; 0.2 ml contained 5×10^6 tumor cells.

The animals were divided into 3 groups. Group 1 mice were intramuscularly (right hind paw) injected with 0.2 ml tumor cell suspension. Group 2 mice were intramuscularly injected with tumor cell suspension of the same concentration as in group 1 in the left (0.2 ml) and right (0.2 ml) hind paws. Group 3 mice were injected with the suspension into the sole between the second and third toes; 0.1 ml suspension (2.5×10^6 cells) was injected with a thin needle.

All animals were sacrificed by ether overdosage 13 days after transplantation. Each animal was autopsied, the material was collected for subsequent morphological analysis. The primary tumor nodule, all visible lymph nodes (inguinal, axillary, paraaortal), liver, spleen, both kidneys with adrenals, pancreas, lungs, heart, and brain were collected. All organs were fixed in 10% neutral formalin and histological sections

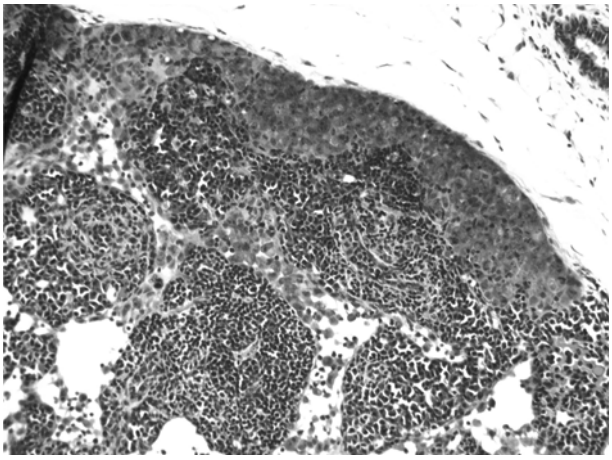

Fig. 1. Metastasis of LIO-1 tumor in the marginal sinus of the lymph node. Hematoxylin and eosin staining, ×100.

were prepared by the standard methods. Metastases were counted in each group.

RESULTS

Morphological studies showed solitary local metastases in 3 of 25 mice in group 1 animals after intramuscular injection of LIO-1 suspension in the right hind paw.

No metastases were found in any of 22 mice in group 2 after intramuscular injection of LIO-1 in both paws.

Local metastases were found in 6 of 8 mice after injection of LIO-1 cells in the sole; some of animals had 2 and more lymph nodes with metastases (Fig. 1).

Hence, the incidence of metastases increased significantly only after injection of LIO-1 suspension in the paw sole.

Injection of LIO-1 lymphosarcoma cells in the mouse paw soles is suggested as an experimental model for the reproduction of local metastases.

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