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EDITORIAL

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Lymphatic Dissemination of Cancer Cells

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The experimental results obtained by *Franchi* and collaborators and published elsewhere in this issue show that the lymphogenic metastatic paths of malignant tumors are characterised by various factors. If there is no hindrance to the flow from the lymphogenic drainage area of the malignant tumor, then metastases are to be expected in the immediately following and regional lymph nodes.

If the lymphogenic drainage path is blocked and other drainage possibilities are lacking, a collateral circulation develops. Having by-passed the block the collateral vessels usually lead back to the original flow.

However, when there are two possible primary lymphogenic drainage paths then the main flow takes place along the more direct path. If this path is blocked the main flow will occur via the second possible path, and at the same time collateral vessels develop in the blocked area.

Only with reservations is it possible to transfer the results obtained by *Franchi* and collaborators to human beings. Lymphographic examinations have shown that with a total block of a lymph node group due to lymph node metastases, as well as following extirpation of lymph nodes, similar alterations to those in animal experiments can be observed. Collateral vessels are able to by-pass damaged lymph nodes, and also provide a connection to other regions of flow which were not originally connected to the drainage area of the tumor. This means that the lymph node metastases do not always have to spread along the paths indicated, but may also arise in the neighbouring flow areas.

There is hardly any more doubt about the existence of lympho-venous shunts in human beings. Thus it seems important to find an answer to the question as to whether lympho-venous shunts are opened by a lymph block. Every now and again, during lymphographic examinations of tumor patients, one finds concentrations of contrast medium in organ regions which do not lie along the direct lymph drainage route of the punctured lymphatic vessel. Thus concentrations of contrast medium were observed for example in the liver. The most likely explanation for this is a lympho-venous short-cut to the mesenteric veins.

In the study made by *Franchi* and collaborators no explanation is given for the fact that collateral vessels develop parallel to the blocked lymph nodes and vessels in animals with tumors, whereas this is not the case in the healthy control animals. It might be conceivable that, in the mice with implanted tumors, premature deposition of metastases in the para-aortic lymph nodes was caused by the block. The resulting hindrance in flow could be the reason for the rapid development of collaterals parallel to the lymph nodes, which were blocked using Neoprene Latex.

In clinical practice this means that metastases should also be searched for where they are not primarily to be expected, particularly when there is hindrance to lymph flow. These considerations emphasize the limitations of present day cancer therapy.

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ABSTRACTS

Clinical Fields

SUTER, P. F., R. W. GREENE, (Div. Radiol., Dept. Clin. Sci. Sch. of Vet. Med., Univ. of Calif. Davis, Calif. 95616, U.S.A.): **Chylothorax in a Dog with Abnormal Termination of the Thoracic Duct.** J. Amer. Vet. med. Ass. 159 (1971), 302-309

In a 2-year-old male Afghan Hound with severe cough and dyspnea of 2 months' duration, a chylothorax was diagnosed clinically and from laboratory analysis of the thoracic fluid. Direct lymphography was done to outline the rupture of the thoracic duct by injecting 8 cc of ethiodized oily contrast medium (Ethiodol) into a lymphatic of the left hind paw. After an unsuccessful attempt to prevent the accumulation of chyle in the thorax by duct ligation, the dog died from a pneumothorax following a second surgical intervention. The thoracic duct and lymphatics of the mediastinum of the postmortem specimen were injected first with a water-soluble contrast medium (Hypaque, 75%) and then filled with acetone-soluble vinylite for identification during dissection.

On postmortem dissection, it could be shown that the obstruction at the junction of the thoracic duct with the venous angle, as seen on the lymphographic study, was due to congenital absence of the connection between the thoracic duct and the precava.

The absence of a normal opening of the thoracic duct into the venous system caused chylous reflux into the mediastinal nodes, lymphatics and the tracheal duct. The chylothorax was due to a leakage from those smaller lymphatics rather than from a rupture of the main duct. In addition to the abnormality of the thoracic duct, a poor functioning of the lymphaticovenous anastomosis was postulated.

The most common cause of canine chylothorax is trauma; tumorous processes in the mediastinum rarely cause chylothorax. The role of congenital malformations, as reported in the present case, is probably more important than is generally assumed. Two similar cases have been seen since this article was written.

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