

Case Report Paper

The popliteal lymph node group as a naturally positioned model for research on lung cancer metastasis

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Lung cancer originates so close to the pulmonary veins that penetration into the blood circulation is naturally assured. Despite such excellent *hematogenous* opportunities, it is the *lymphogenous* route that brings about centrifugal lymph node involvement as low down as the abdomen. Therefore, it is hypothesized that the more distant popliteal nodes should be purposively harvested ethically, cut serially, processed technically and examined very minutely after specially staining for both blood and lymph endothelium. This model will probably help to explain nature's secret, namely, that circulating lung cancer cells are largely ineffective colonizers once lymphoid tissues are located afar.

Key words: Lung cancer, popliteal lymph nodes, metastasis.

INTRODUCTION

Nature as it were has so strategically juxtaposed lung cancer and the pulmonary veins that following each cardiac output, any cancer cells contained in the aorta are perforce propelled without discrimination to both near and far living tissues (Onuigbo, 2002). If so, what of the lymph nodes? In particular, what of the knee-level, uniquely ensconced, popliteal, lymph nodes? Concerning their invasion, Willis (1973) in his weighty book, did not even go as far as to them but only to the abdominal nodes. He presented their position picturesquely thus: "intra-thoracic tumours, such as carcinomas of the lungs with metastases in the mediastinal glands, often exhibit discrete deposits in the abdominal glands, these diminishing in centrifugal order."

Order of the centrifugal type occurs during metastasis and implies that:

- (a) Distance is the essential element.
- (b) Lymphatic is the rational route.

Clearly, the far-sited popliteal nodes were not being reached through the lymphogenous route from the lung attack base by the time of death. Meanwhile, this was happening despite their being open also to subjugation through the readily available alternative hematogenous route. Since these distant popliteal lymph nodes, which

must be fed by cancer-carrying blood, are scarcely, if ever, mentioned in the literature of lung cancer colonization, the overly oddity of their limited or near freedom from attack deserves resourceful research.

Research should be slanted to take into account the curious phenomena that occur in lung cancer metastasis as follows: (1) Article (Onuigbo, 1963) on the body's only blood filtration unit, the glomerulus, demonstrated that the majority of circulating lung cancer cells are not entrapped in the kidneys but emerge there from and ultimately probably perish in the blood stream. (2) Article (Budinger, 1958) on the opposite lung, the symmetrical organ positioned by Nature just across the midline, revealed that it usually is not much invaded. Indeed, Budinger⁵ called attention to this propensity as "the seeming reluctance of this tumor to involve the opposite lung." (3) Article (Onuigbo, 1967) on the large lymph channel, the 45 cm thoracic duct, using the Swiss-roll technique, revealed panoramically that lung cancer cell, which were in transit in this long conduit, fared better while in the lymph itself than among the commingled red cells.

Cells are to be examined exhaustively. Up to the recent times, the pernicious problem was that researchers were unable to stain differently the endothelial cells of blood and lymph vessels (Holman, 1955). However, there now exist satisfactory techniques for achieving this peerless

purpose (Stacker et al., 2002). Consequently, researchers are now well placed to pursue any hypotheses involving the intricacies concerning blood and lymph inequalities in cancer dissemination.

Human model

Proposal of the promising type can single out the human popliteal lymph nodes. For one thing, although obscurely positioned, the fertility of their soil is not in question. Thus, typical cases of their invasion are reported from nearby pedal melanomas. (Marone et al., 2007; Georgeu et al., 2002).

For another thing, they are handy enough for dissection (Sholar et al., 2005). More specifically, there is need to account for what happens to the dangerous cells that are conveyed of necessity to them from far away lung carcinomas.

Carcinomas of the lung, now very rampant in certain countries, (Travis et al., 1995) should be useful for research on account of the availability of their necropsy materials. Therefore, it is suggested that, with the permission of ethical committees, numerous popliteal lymph nodes could be harvested during examinations at post mortem. When stained differentially vis-a-vis blood and lymph capillaries, painstaking work on this choice environment will assuredly unmask the state of the lung cancer cells brought there through either of these routes by the time of death. Therefore, it is predicted that, if well selected series are examined exhaustively in the world's centers of research, nature's secrets will sooner than later be decoded. In principle, whatever studious steps they take, renowned researchers should aim at accounting for the astounding discrepancy between the giant opportunities open to blood-borne lung cancer cells to reach and attack popliteal lymph nodes and the dwarf deposition that is actually being encountered there.

There is the proviso that the priceless materials obtained from the popliteal fossa must be so serially sectioned, so as to facilitate not only specifically differentiating between blood and lymph endothelium within the popliteal nodes themselves but also objectively observing the fate of any cancer cells present in their particular parenchyma at the very time of demise.

Conclusion

The body of knowledge so far presented underscores the need to understand why lung cancer cells thrive so well when carried precariously by lymph to near lymph nodes and not when transported profusely by blood to their equally suitable but far soils. Now, numberless lung cancer cells are carried about continually in the blood

stream during life. Therefore, since they cruise to such peripheral parts of the body as the popliteal nodes, with little or no detriment, nature's secret codes are involved. Can these be cracked? Yes! If the popliteal arena is properly probed, why circulating cancer cells become largely ineffective naturally within these nodes will be discovered in human beings.

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