THE SCIENTIFIC SIGNIFICANCE OF THE ASYMMETRICAL SPREAD OF LUNG CANCER SEEDS TO THE BILATERAL ADRENAL SOILS: HISTORICAL REVIEW AND FUTURE PROSPECTS

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ABSTRACT

In 1889, Julius Cohnheim, a great German Pathologist, remarked that autopsies reveal Nature's footprints in the human body. Hence, he deemed their results to be more important than those obtained from animal experiments. Therefore, autopsies performed on lung cancer patients during that century were reviewed with special reference to how the bilateral adrenal glands were invaded. Distinct asymmetry was demarcated. It was therefore concluded that this is in line with the recent concept of the development of new lymph vessels, i.e., lymphangiogensis. This is a phenomenon that translational research should pursue vigorously as regards the target therapy of cancer.

No: of Tables : 1 **No: of Figures: 1** **No:of References:20**

INTRODUCTION

In 1889, a great German Pathologist, Julius Cohnheim [1], postulated that autopsies "are all in a manner experiments instituted by nature, which we need only rightly interpret to get a clear idea of the causes, laws of growth, and significance of the tumour." Therefore, this paper reviews lung cancer cases whose autopsies illumined bilateral invasion of the adrenal glands. Incidentally, in 1842, Budd [2] had argued that, in a great number of diseases affecting paired organs, "the affection of one part has begun before that of its fellow, and, in the part first affected, has generally attained a higher degree than in the other." Consequently, related evidence needs to be sought from the publications of the medical men of yester years.

Historical Texts

The collation of cases from my historical Mini-Library may be subjoined chronologically in tabular form:

Tabulation of historical examples chronologically.

Date	Author	Description
1863 –	Peacock [3].	"One of the suprarenal capsules was entirely destroyed, being converted into a medullary sarcomatous mass as large as a pullet's egg. The other was similarly diseased, but still displayed some slight remains of its natural structure at one part."
1868 –	Bristowe [4].	"Both suprarenals were infiltrated with similar materials and had right somewhat smaller."
1874 –	Southey [5].	"Both supra-renal capsules, the left one being especially enlarged."
1885 –	Coats [6].	"The left suprarenal capsule was very greatly enlarged by cancerous tumours and there were a few small ones in the right capsule, which was not enlarged."
1895–	Hawthorne [7].	"The suprarenal capsules are greatly enlarged, and are almost entirely converted into tumour substance; the right one, which is the more enlarged of the two, is about half the size of the kidney."
1897 –	Packard and Steele [8].	"The suprarenal capsules are both much enlarged, the right especially so."

DISCUSSION

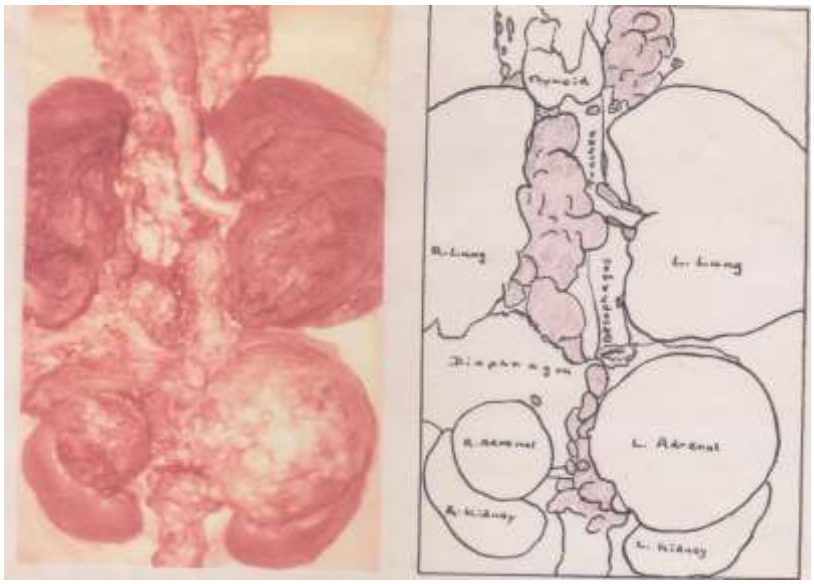
The autopsy has traditionally featured the display of the bodily parts on the table. However, for a better recognition of topographical relationships, I introduced the mono-block formalin-fixation method which ensures the preservation of the bodily parts from the neck down to the pelvis [9]. For example, lymph node metastases are best seen in their centrifugal diminution pattern [10]. Moreover, on tracing the positions of the earliest colonies in them, it became apparent, as was personally remarked on six times, that the process involved the *formation of new lymphatic vessels* [11], i.e., the currently named "lymphangiogenesis." The premier position of lymphangiogenesis in metastasis has been demonstrated in respect of the longstanding puzzling selectivity of the adrenal glands in lung cancer [12]. Undoubtedly, virgin fields will yet be explored.

In this context, according to an old parlance [13], lung cancer cells have to be regarded as "seeds" sown on the "soils" of the adrenal glands. For example, Fig 1 shows a right lung primary growth which spread upwards but more to the left cervical lymph nodes than to the right ones. Similarly, in the downward direction, the left adrenal gland bore the brunt of the attack more than the right one.

It is of historical interest that, in 1897, Kelynack [14] noted the "scant attention" paid to the adrenal glands and made "a plea for a more thorough investigation of all adrenal growths coming under observation." Incidentally, my thorough review of organ selectivity in cancer metastasis detected twelve classes, eleven of them being associated with the adrenal glands [15]. Accordingly, translational research, as was highlighted by Woolf [16], should be beamed on these diminutive organs. Indeed, their anatomical position was singled out by Bourne [17] as being not merely fortuitous but related to some evolutionary factor.

Conclusion

Concerning anatomy, a "Factor" of interest was recently named personally as the "Erythrocyte Associated Necrosis Factor" (EANF) [18]. Now, this factor was identified anatomically in the microenvironment of the thoracic duct. Therefore, retrieval through cannulation should be effected in consenting patients [19]. Thereafter, the new technique of videomicroscopy should play a robust part [20]. In all probability, translational research on the priceless retrieved materials will lead to breakthroughs, including the discovery of the target therapy which may conduce to cancer cure [21].



Legend to Illustration.

Fig. 1. Mono-block formalin-fixed human specimen showing directions of lymph node spread with the associated asymmetrical adrenal deposits.

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