

# The Transpulmonary Passage of Cancer Cells: Historical Review

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## Abstract

Macfarlane Burnet, who is far famed in oncology, recommended during his address on the morphogenesis of cancer that researchers ought to know the historical aspects of their field. In this context, in 1952, Zeidman and Buss used experimental animals to document the transpulmonary passage of cancer cells. However, they did not supply the historical background. Therefore, this paper collates the observations of the old masters in this field from 1845 to 1899.

**Keywords:** Cancer; Transpulmonary passage; Animal experiments; Historical antecedents

## Introduction

Marfarlane Burnet [1] a renowned oncologist, recommended during an incisive address on the morphogenesis of cancer that authors should be conversant with the history of their subject. Consequently, this paper provides some data in this respect. Actually, Rudolph Virchow [2], although he is the recognized father of cellular pathology, erred by asserting that “There are, however, many facts, which speak but little in favour of the infection's taking place by means of really detached cells.” In particular, he had argued that mammary cancer “would necessarily rather produce cancer in the lungs, if it were anything corpuscular which was conveyed away, became stagnated and gave rise to a new eruption of the disease.” The paradoxical nature of this stance was documented elsewhere [3].

However, it is of interest that Theodor Billroth [4] had admitted in 1871 thus: “I think that, with our present knowledge about the independent life of pathologically-neoplastic cells, there can be no doubt of the possibility of such a process.” Indeed, by 1952, Zeidman and Buss [5] used animal experiments to confirm transpulmonary passage of tumor cell emboli. However, since their search of historical materials was limited, fuller accounts are deemed to be worthy of documentation.

## Historical Texts

There are actually several historical texts, which show that some medical masters appreciated that cancer cells must have passed through the lung system during dispersal. The earliest example that I found was Budd [6] who expressly recognized the transpulmonary passage of these cells in 1845.

In particular, the alternative theory of transmission by means of Juices was jettisoned. Thus, the cell concept was expressed confidently decade by decade in 1858 [7], 1867 [8], and 1875 [9]. Then, by 1883, Joseph Coats [10], the first Professor of Pathology at the University of Glasgow, Scotland, wrote a monograph on Pathology. This tome exhibited awareness of transpulmonary passage. Thus, in his own words, “the material which produces these tumours often passes to some extent through the wide capillaries of the lung and on into the systemic arteries so that we may have tertiary tumours occurring at the same time in a variety of organs.” He was convinced that, in metastasis, “the actual cells of the tumour are carried off and deposited at a distance.”

It is well worth adding that the blackness of the melanoma in both its primary position and possible pathways of spread proclaimed itself visibly. No wonder that, in the next decade, Henry Rolleston [11], Physician to St. George's Hospital, London, made good use of it in the year 1899. Thus, in a clinical lecture on secondary melanotic sarcoma of the liver, he reported the case of a 59-year-old man who underwent

removal of the right eye for primary melanoma. At necropsy, he exhibited secondaries massively in the liver. In discussing the route of spread from the eye to the liver, which apparently occurred in the absence of deposits in the lungs, he affirmed perceptively as follows: “It is remarkable that the cells of melanotic sarcoma being, as they usually are, larger than the cells of the other sarcomata which are stopped by the lungs manage to pass through the pulmonary capillaries and to infect the liver.”

## Discussion

Liver and other metastases were explored fully half a century later, in 1952, when explanatory animal experiments were undertaken by Zeidman and Buss[5]. As I see it, they only confirmed experimentally what had held sway for more than a century. Accordingly, my reporting of these cases illustrates the helpful role of historical research in revealing data which were hitherto unnoticed. This conclusion was supported by Cushman Haagensen [12], who exhibited old items from the New York Academy of Medicine Library. As he put it, “It is to be hoped that an historical exhibit of this kind may stimulate in those writing on the subject of cancer a more just appreciation of the past.” Elsewhere, I illustrated, as a general principle, that there are actually false firsts in the existing cancer literature [13]. Consequently, in conclusion, whenever any such error is detected, it should be documented in order to advance scientific communication.

## References

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